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Influences of Comorbid Disorders on Personality Assessment Inventory Profiles in Women with Posttraumatic Stress Disorder

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Abstract

The present study describes Personality Assessment Inventory (PAI) profiles for women with posttraumatic stress disorder (PTSD). Four groups of women were sampled: single Axis I diagnosis of PTSD; PTSD and major depressive disorder (MDD); PTSD, MDD, at least one other Axis I disorder; and controls with no Axis I disorder. Higher comorbidity rates were associated with higher mean profile elevations and broader range of endorsed symptoms. The group with the highest rate of comorbidity produced profiles most similar to previously published reports of patients with PTSD. This is in contrast to women with a single diagnosis of PTSD, who produced relative mean elevations only on subscales measuring distress caused by trauma and physiological symptoms of depression. Thus, published profiles may be more reflective of PTSD with comorbidity than a single diagnosis of PTSD.

Keywords

PTSD; Personality Assessment Inventory (PAI); psychological assessment; women

The assessment of Posttraumatic Stress Disorder (PTSD) is a complex process often complicated by heterogeneous between-patient presentation, significant Axis I and Axis II comorbidity. Optimal assessment of posttraumatic stress disorder (PTSD) should include measurement of traumatic events, multiple measures of PTSD, use of structured diagnostic interviews and broad-based symptom and personality measurement (Calhoun *et al.*, 2000; Keane *et al.*, 1987; Sutker *et al.*, 1991).

In this context, the Personality Assessment Inventory (PAI; Morey, 1991; 2007) has been shown to be useful in the assessment of PTSD. The PAI is a broad-based measure of psychopathology with strong psychometric properties (Morey, 1996). It includes eleven non-overlapping clinical scales, each with 3–4 subscales, and assesses a wide range of psychiatric disorders and symptoms. Several recent studies have supported the use of the PAI in PTSD assessment (Cherepon & Prinzhorn, 1994; McDevitt-Murphy *et al.*, 2005;

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Mozley *et al.*, 2005) and in the assessment of behavioral disturbance associated with PTSD such as anger and aggression (Crawford *et al.*, 2007)

There is converging evidence documenting how a diagnosis of PTSD is typically reflected in clinical profiles of the PAI (Cherepon & Prinzhorn, 1994; Holmes *et al.*, 2001; McDevitt-Murphy *et al.*, 2005; Morey, 1996; Mozley *et al.*, 2005). Both Holmes *et al.* and Mozley *et al.* found elevations on the Somatic Complaints (SOM), Anxiety (ANX), Anxiety-Related Disorders (ARD), Depression (DEP), and Schizophrenia (SCZ) clinical scales, even though samples were from quite different populations. Holmes *et al.* examined a mixed sample of men and women who developed PTSD after a motor vehicle accident, while Mozley *et al.* studied male veterans with combat-related PTSD. A third study that examined profiles of women from the community with PTSD found at least moderate elevations (t -score ≥ 60) on the same scales noted by Holmes *et al.* and Mozley *et al.* with clinically significant elevations (t -score ≥ 70) on the DEP scale and the Anxiety-Related Disorders Traumatic Stress subscale (ARD-T) (McDevitt-Murphy *et al.*, 2005). In contrast to the two previous studies, a clinical elevation was also observed on the Borderline Features (BOR) scale, and moderate elevations on the Paranoia (PAR), Negative Impression (NIM), Nonsupport (NON) and Treatment Rejection (RXR) scales. Mozley *et al.* also reported clinical subscale elevations that reflected heightened traumatic stress, conversion, somatization, health concerns, affective features of anxiety, physiological features of anxiety, cognitive, affective and physiological features of depression, social detachment, thought disorder, and affective instability. On the treatment and interpersonal scales, these authors reported clinical elevations on physical aggression.

Although these studies provide converging data related to the profile configuration of patients with PTSD and have supported the utility of the PAI as a useful part of PTSD assessment, it is currently unclear to what extent these studies reflect persons with a single diagnosis of PTSD, i.e., “pure” PTSD, or whether they are a reflection of PTSD and additional psychiatric comorbidity. It has been well documented that PTSD often manifests amid many co-occurring disorders. An estimated 79–83% of individuals with PTSD have at least one other Axis I disorder (Brady, 1997; Breslau *et al.*, 1991; Creamer *et al.*, 2001; Kessler *et al.*, 1995). In a national survey in the United States, Kessler and colleagues (1995) found that 16% of individuals with PTSD had one additional disorder, 17% had two, and 50% had at least 3 other disorders. An estimated 26% of individuals with PTSD will have a comorbid diagnosis of a major depressive episode (Maes *et al.*, 2000; Oquendo *et al.*, 2005). High rates of comorbidity in individuals with PTSD necessitates screening for other psychiatric disorders (Brady, 1997).

Unfortunately, despite high rates of psychiatric comorbidity, there is little known regarding the impact of comorbid disorders on the PAI clinical profile presentation of patients with a primary diagnosis of PTSD. Many studies have not assessed or reported rates of additional psychiatric comorbidity (Morey, 1996). Indeed, only one of the previous studies examining PAI profile configuration of PTSD patients examined the influence of comorbidity on the clinical profile presentation. Specifically, Mozley *et al.* (2005) reported that profiles of individuals with PTSD and a comorbid diagnosis of major depressive disorder scored significantly higher on DEP, ANX, SOM, Suicide Ideation (SUI), and Stress (STR) scales and lower on the Warmth (WRM) scale than those with PTSD alone. Influences of other Axis I disorders on clinical profiles, however, were not addressed.

Clearly, comorbidity of psychiatric illness has an effect on clinical profile elevation. Given that other previous studies examining profiles of persons with PTSD on the PAI have failed to assess or report comorbidity, it is unclear to what extent the current knowledge base regarding PAI profile configuration of patients with PTSD reflects presentations of “pure”

PTSD or whether it better reflects the presentation of PTSD plus comorbid psychiatric disorders. Thus, the present study seeks to describe relevant PAI scale elevations in a sample of women with PTSD and various degrees of comorbidity. Specifically, the study was designed to provide preliminary data on the impact of psychiatric comorbidity on PAI profile configuration. Women with a single diagnosis of PTSD were compared to (1) women with PTSD and depression, (2) women with PTSD, depression and other axis 1 disorders, and (3) a control group of women without Axis I disorders. Further, the relationship between clinical profile elevations obtained in the present investigation was compared to those from previous studies.

Method

Participants

The present study included 88 women, drawn from a larger study that investigated hostility, health and PTSD ($n=148$). Women were recruited via flyers on bulletin boards at VA and community hospitals 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." Exclusion criteria for the larger study included previous diagnosis of organic mental disorder, psychosis, bipolar depression, current drug/alcohol abuse/dependence, seizure disorder, use of beta blockers or report of current domestic violence. Approval for the study was obtained from the appropriate institutional review boards of the university and VA medical centers where the study was conducted. All participants gave informed consent and the procedures involved in the study were explained in detail.

Inclusion criteria for the current study included a current diagnosis of PTSD or no Axis I diagnosis ($n=107$). Individuals with invalid PAI profiles were excluded. Profile validity was judged using standards published by the test author (Morey, 1996). Profiles were deemed invalid if t-scores were greater than or equal to 95 on Negative Impression (NIM), 66 on Positive Impression (PIM), 73 on Inconsistency (ICN), or 75 on Infrequency (INF) validity scales, and 19 women were excluded from the study due to invalid profiles. No significant differences in age, race, socio-economic status, years of education, or marital status were found between the original and the excluded samples.

Four diagnostic groups were created based upon current diagnoses of PTSD, major depressive disorder (MDD), and other Axis I disorders (++): 1) PTSD alone ($n=15$), 2) PTSD + MDD ($n=15$), 3) PTSD, MDD, and at least one other Axis I disorder (PTSD+MDD ++; $n=18$), and 4) a comparison group with no Axis I disorder ($n=40$). Of the third group with at least one other Axis I disorder, 8 had 1 other disorder, 7 had 2 other disorders, 2 had 3 other disorders, and 1 had 4 other disorders. The most common "other" disorder was specific phobia ($n=9$), followed by general anxiety disorder ($n=8$). Other disorders included social anxiety ($n=5$), panic disorder ($n=3$), obsessive-compulsive disorder ($n=3$), eating disorders ($n=3$), and agoraphobia ($n=1$).

Trauma exposure was highly prevalent in the sample. Ninety-five percent of women without PTSD reported a trauma history. Types of primary traumas for each group are displayed in Table 1 for descriptive purposes. Collapsing across PTSD diagnoses, the following primary trauma types were endorsed: childhood physical or sexual assault (13% in non-PTSD; 25% in PTSD); adult physical or sexual assault (3% in non-PTSD; 17% in PTSD); domestic violence (5% in non-PTSD; 15% in PTSD); witnessing violence as an adult (3% in non-PTSD; 6% in PTSD); witnessing violence as a child (24% in non-PTSD; 6% in PTSD); death of someone close (29% in non-PTSD; 17% in PTSD); accident (3% in non-PTSD; 4%

in PTSD); disaster (5% in non-PTSD; 0% in PTSD) and other (16% in non-PTSD; 10% in PTSD).

Demographic information for the study groups is provided in Table 2. The mean age of the sample was 38.4 (SD=12.4, range 19–70). Sixteen percent of the participants were veterans (n=14). There were no differences between groups in the percentage of veteran women participants. Minorities represented 55% of the sample. There were no differences between groups in age, race, or marital status (see Table 2). The mean socioeconomic status (SES) of the participants was middle class (M = 39.8, SD = 18.0), according to the Hollingshead index (Hollingshead & Redlich, 1958). Not surprisingly, women with psychiatric disorders had lower SES, education and were less likely to be working than women without psychiatric disorders.

Clinical Diagnosis and Measures

Clinician-Administered Posttraumatic Stress Disorder Scale (CAPS; (Blake *et al.*, 1995; Blake *et al.*, 1990). PTSD diagnosis was based on the CAPS, a structured clinical interview based on the DSM-IV which is considered state-of-the-art for PTSD assessment and diagnosis. It assesses the frequency and severity of core and associated PTSD symptoms in its military and civilian versions. The F1/I2 criterion rule was used, so that symptoms with a frequency of 1 or higher and severity of 2 or higher were considered significant (Weathers *et al.*, 1999). Individuals were included in the PTSD group if they endorsed at least 1 re-experiencing, at least 3 avoidance and numbing symptoms, and at least 2 hyperarousal symptoms, and symptoms caused significant impairment or distress. Administration of the CAPS was modified 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.

Structured Interview for DSM-IV diagnosis (SCID; First *et al.*, 1994) The SCID was administered in order to assess other Axis I disorders. Raters were extensively trained in both the CAPS and SCID, and supervised by a licensed psychologist. Inter-rater agreement for a PTSD diagnosis was excellent ($\kappa = .93$).

Personality Assessment Inventory (PAI; Morey, 1991). The PAI is a 344-item, self-report measure of psychopathology with good psychometric qualities including demonstrated reliability and validity (Morey, 1996). It contains 22 non-overlapping full scales including 4 validity scales, 11 clinical scales, 5 treatment consideration scales, and 2 interpersonal scales. Items are rated on a four-alternative scale with the anchors Totally False, Slightly True, Mainly True, and Very True.

Davidson Trauma Scale (DTS; Davidson *et al.*, 1997). The DTS is a 17-item self-report, pen-and-paper measure of PTSD symptoms. Participants indicate an autobiographical narrative of the trauma, then indicate frequency and severity of all DSM-IV PTSD symptoms over the past week. Frequency (0[not at all] – 4 [everyday]) and severity (0 [not at all distressing] – 4 [extremely distressing]) are summed for a total score. The DTS has an internal consistency of .99 and test-retest reliability of .86 for trauma populations.

Analyses—Group differences on PAI profiles were analyzed using a multivariate analysis of variance (MANOVA) for mean t-scores of each scale and subscale, and post-hoc analysis of variance (ANOVA) was used to identify significant pair-wise group differences for each scale/subscale. Significance levels were adjusted to $p \leq 0.0002$ using Bonferroni correction to correct for error due to the large number of scales and subscales. Effect size estimates for clinical scale differences were computed by calculating Cohen's d (Cohen, 1988). Similarity between each group profile and published results was determined with Q-correlations (Harris, 1982). For the Q-correlations, mean t-scores from each scale were entered as

individual observations, and overall profiles of different diagnostic groups from the present study and published PAI profiles (Holmes et al., 2001; McDevitt-Murphy et al., 2005; Morey, 1996; Mozley et al., 2005) were used as variables.

Results

PTSD Severity

PTSD severity based on the DTS was compared across all four groups. As shown in Table 2, there was a significant difference in total DTS scores between groups, $F(3,84)=41.6$, $p < .0001$. All three psychiatric groups scored significantly higher than controls on PTSD symptom severity. Among those women with PTSD, psychiatric comorbidity was associated with increased PTSD symptom severity. Women with PTSD and comorbid depressive disorder, $F(1,84)=8.86$, $p=.0038$, and those women with multiple comorbidities, $F(1,84)=11.04$, $p=.0013$, scored significantly higher than the PTSD-only group. There was not a difference in DTS total score among the two groups of women with PTSD and comorbid disorders $F(1,84)=.05$, $p=.83$, n.s.

PAI Profile Configuration

Mean t-scores for PAI full scales and subscales were compared across four groups: women with a single diagnosis of PTSD (PTSD); women with a diagnosis of PTSD and comorbid major depressive disorder (PTSD+MDD); women with a diagnosis of PTSD, major depressive disorder, and at least one other Axis I disorder (PTSD+MDD++); and women with no Axis I diagnosis (Control). Mean t-scores and standard deviations for full scales and subscales are shown in Table 3. Mean PAI full scale profiles for the 4 groups are shown in Figure 1, and subscales in Figure 2. Effect sizes of group differences were measured with Cohen's d , and are presented in Table 4.

Single Diagnosis of PTSD

The PAI full scale mean profile of women with a single diagnosis of PTSD is shown with the solid line in Figure 1. Interestingly, on basic PAI clinical scales there were no elevations in the clinically ($t \geq 70$) or moderately elevated ($t \geq 60$) ranges. Highest elevations on basic clinical scales were on the Anxiety-Related Disorders (ARD) scale ($t=59$), the Depression (DEP) scale ($t=58$), and the Borderline Features (BOR) scale ($t=58$).

Clinical subscales were characterized by moderate elevations on the Traumatic Stress (ARD-T) subscale ($t=65$), the Physiological symptoms of depression (DEP-P) subscale ($t=61$), and the Negative Relationships (BOR-N) subscale ($t=60$) (see Figure 2). On treatment consideration scales, the Stress (STR) scale ($t=59$) was most elevated.

Results comparing women with a single diagnosis of PTSD to women with no Axis I diagnosis found statistically significantly higher elevations ($p \leq 0.0002$ after Bonferroni correction) on the ARD and DEP clinical scales and ARD-T and DEP-P subscales when compared to women with no Axis I diagnosis. As shown in Table 4, the greatest effects were on the ARD-T ($d=1.61$) and DEP-P ($d=1.33$) subscales, with large effects ($d \geq 0.8$) also found on Anxiety (ANX), ARD, DEP, and BOR clinical scales.

Diagnosis of PTSD and Major Depressive Disorder

The mean profile of women with PTSD and comorbid MDD is shown with a dashed line in Figure 1. The mean profile configuration was characterized by a clinical elevation on the DEP scale ($t=71$), with moderate elevations on the SOM ($t=60$), ANX ($t=60$), ARD ($t=62$), and BOR ($t=61$) full scales. As shown in Table 3, examination of the clinical subscales

indicated elevations on scales measuring distress associated with traumatic stress, symptoms of depression, anxiety, and borderline features.

Profiles of women with both PTSD and MDD, were significantly higher than those of women with no Axis I diagnoses on a variety of clinical scales and clinical subscales including those that measured distress associated with somatic complaints, anxiety, anxiety-related disorders, symptoms associated with schizophrenia, borderline features and drug abuse. (see Table 3). The comorbid group scored higher on the ICN and NIM validity scales, and SUI, STR, NON, and RXR treatment outcome scales. The greatest effects were on the DEP-A ($d=2.35$) and DEP-P ($d=2.12$) subscales, with large effects ($d\geq 0.8$) also found on SOM, ANX, ARD, DEP, PAR, SCZ, BOR, and DRG clinical scales (see Table 4).

Diagnosis of PTSD, Major Depressive Disorder, and At Least One Other Axis I Disorder

The mean profile of women with highest rates of comorbidity, i.e. PTSD, MDD, and at least one other Axis I disorder, is shown with a dotted line in Figure 1. Here the mean profile was characterized by clinical elevations on the ANX ($t=71$), ARD ($t=76$), and DEP ($t=75$) scales with moderate elevations on the SOM ($t=66$), MAN ($t=60$), PAR ($t=65$), SCZ ($t=67$), and BOR ($t=66$) scales. Clinical subscale elevations are shown in Table 3.

Women with PTSD, MDD, and at least one other Axis I disorder differed significantly from controls on 7 of the 11 clinical scales. Further, differences in validity scales were found on Negative Impression (NIM) and Positive Impression (PIM) scales. On treatment consideration scales, they reported more suicidal ideation, stress, a lack of social support and were less likely to view treatment as unnecessary than women without a psychiatric condition. Interpersonally, women with comorbid psychiatric disorders were less warm than controls (see Table 3).

Women with a diagnosis of PTSD, major depression, and at least one other Axis I disorder differ from controls on multiple subscales, which are indicated in Table 3. The greatest effects were on the ARD-T ($d=3.00$), DEP ($d=2.94$), ANX ($d=2.72$), and ANX-A ($d=2.71$) scales and subscales (see Table 4).

Comparison of Single Diagnosis and Comorbid Diagnostic Groups

PTSD versus PTSD+MDD—Analyses comparing women with a single diagnosis of PTSD to those with PTSD and depression found no statistically significant differences across full scales or subscales.

PTSD+MDD versus PTSD+MDD++—Profiles of women with PTSD, MDD, and at least one additional Axis I disorder were not more elevated than women with PTSD and major depression on any clinical full scales, but were significantly more elevated on the ANX-A subscale.

PTSD versus PTSD+MDD++—The mean profile of women with PTSD, MDD, and at least one other Axis I disorder was significantly more elevated on the ANX, ARD, DEP, and SCZ clinical scales in comparison to women with a single diagnosis of PTSD. On validity scales, higher elevations were observed on the NIM scale. Women with at least three diagnoses demonstrated significantly higher elevations than individuals with a single PTSD diagnosis on 7 of the PAI clinical subscales (see Table 3)

Comparison with Previous Reports

Overall PAI mean profiles for women with 1) PTSD only, 2) PTSD+MDD, and 3) PTSD +MDD++ were compared to published PAI profiles for male combat veterans with PTSD

(Morey, 1996; Mozley *et al.*, 2005), community dwelling women with PTSD with or without comorbid Axis I disorders (McDevitt-Murphy *et al.*, 2005), and men and women with PTSD following a motor vehicle accident (Holmes *et al.*, 2001).

Figure 2 shows overall PAI profiles for each diagnostic group in the present study relative to published PAI profiles for individuals with PTSD. Similarity measures were calculated using a Q-correlation between mean PAI scale t-scores from each diagnostic group (present study) and published reports (Holmes *et al.*, 2001; McDevitt-Murphy *et al.*, 2005; Morey, 1996; Mozley *et al.*, 2005). Table 5 shows that the mean PAI profile of women with the highest rate of comorbidity, i.e. a diagnosis of PTSD, MDD, and at least one other Axis I disorder, is most similar to published profiles (r ranges from 0.6 to 0.9). As expected, controls were negatively correlated with published profiles from PTSD groups.

Discussion

Women with a diagnosis of PTSD, regardless of comorbid status, produced significantly higher elevations on the ARD and DEP clinical scales of the PAI than controls. Further examination of the ARD and DEP subscales reveals that items assessing traumatic experiences and physiological symptoms of depression led to these elevations, since these were the only significantly elevated subscales. Thus, elevations of the ARD-T and DEP-P subscales were most specific to a PTSD profile.

As expected, comorbid diagnoses produced both more and higher elevations. In addition to the ARD and DEP scales described above, significantly higher elevations were found on the SOM, ANX, SCZ, and BOR scales. Additionally, women with a comorbid diagnosis of only MDD also demonstrated elevations on the DRG scale, and women with MDD plus at least one other disorder also produced elevations on the PAR scale.

Previous studies have highlighted subscales, ARD-T, ANX-P, DEP-P, SCZ-T, and BOR-A, associated with a diagnosis of PTSD (Morey, 1996; McDevitt-Murphy *et al.*, 2005). Results were largely consistent with these associations. Consistent with McDevitt-Murphy and colleagues (2005), ARD-T and DEP-P were elevated across all PTSD groups in this study, regardless of comorbidity status. The ANX-P subscale did not differ statistically from controls in the PTSD-only group, but did in both comorbid groups. Finally, the SCZ-T and the BOR-A subscales differed statistically from controls in both comorbid groups, but not in the PTSD-only group.

Of the three PTSD groups in the present study, the group with highest comorbidity was most similar to previously published profiles of individuals with PTSD. Both Mozley *et al.* (2005) and McDevitt-Murphy *et al.* (2005) stated that their PTSD samples included patients with psychiatric comorbidity. It is possible that the others samples including the original PAI clinical standardization sample (Morey, 1996) did as well, but this was not reported. Thus, due to limited information on comorbid Axis I disorders in other studies, it is difficult to comment on the similarity of our sample to those in previously published studies. Since at least half of individuals with PTSD also have at least two other disorders (Kessler *et al.*, 1995), PAI profiles from the high comorbidity group and from published PTSD samples are likely representative of a large portion of patients with PTSD that present with both PTSD and comorbid psychopathology.

The implication of these findings, however, is that the literature examining PAI profiles of patients with PTSD is more reflective of patients presenting with PTSD and comorbidity rather than so called “pure” PTSD. Indeed, in contrast to women with PTSD and comorbid disorders, individuals with only a diagnosis of PTSD produced lower mean profile elevations and endorsed a narrower range of symptoms. Further, in contrast to previously

published reports and the groups with comorbid disorders from the present study, women with only PTSD produced elevations on the PAI full clinical scales that were in the sub-clinical range ($t\text{-score} \leq 70$). Thus, previously published profiles may not be reflective of all presentations of PTSD (e.g., less severe cases of the disorder; those without comorbidity), and care should be taken that a diagnosis of PTSD is not ruled out simply because a PAI profile that is less elevated than previously published profiles.

There are a number of considerations that limit conclusions from the current study. This study is limited by a relatively small sample size and thus results should be viewed as preliminary. Potential gender differences in comorbidity and PTSD is vital to the assessment of PTSD, and thus future studies should include larger samples of both men and women. As these data were abstracted from a larger study that excluded certain Axis I disorders including active psychosis or drug or alcohol abuse/dependence, the full range of psychiatric comorbidity was not included. Similarly, the impact of Axis II pathology on PAI profiles of patients with PTSD was not assessed in the current study. The majority of women in the control condition had experienced significant traumatic events.

Despite these limitations, this is the first study that has specifically examined the impact of comorbidity on the PAI clinical profile configuration of patients with PTSD. A relative strength of this work is that all diagnoses were based on structured clinical interviews (i.e. CAPS, SCID-I). While results are preliminary, they do suggest that the current literature examining PAI profiles of PTSD patients might better reflect the profiles of persons with PTSD and comorbid psychiatric disturbance rather than PTSD alone.

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Figure 1.
Comparison of mean PAI profiles for women with PTSD and varying rates of comorbidity for full clinical scales (above) and full validity, treatment consideration, and interpersonal scales (below).

Figure 2.
Comparison of varying rates of comorbidity and previously published PAI profiles.

Table 1

Trauma Type by Diagnostic Group

	PTSD	PTSD + MDD	PTSD+MDD++	Control
	n=15	n=15	n=18	n=40
Childhood Physical/Sexual Assault	20%	20%	33%	13%
Adult Physical/Sexual Assault	13%	27%	11%	3%
Domestic Violence	13%	7%	22%	5%
Witness to Violence as Adult	20%	0%	0%	3%
Witness to Violence as Child	7%	0%	11%	24%
Death of Someone Close	20%	27%	6%	29%
Accident/MVA/Fire	0%	0%	11%	3%
Natural Disaster	0%	0%	0%	5%
Other	7%	20%	6%	16%

Table 2

Demographic Data and PTSD Severity by Diagnostic Group

	PTSD n=15 M (SD)	PTSD + MDD n=15 M (SD)	PTSD+MDD++ n=18 M (SD)	Control n=40 M (SD)	Tests Statistic
Age	40.53 (13.45)	44.86 (12.55)	40.11 (11.90)	34.35 (11.14)	F(3,84)=3.28
Education	14.60 (2.38)	13.73 (2.34)	14.78 (2.60)	16.65 (2.88)	F(3,84)=5.68**
Socio-economic Status (Hollingshead Index)	44.73 (19.48)	50.53 (17.19)	45.38 (16.80)	31.42 (14.71)	F(3,84)=6.74**
Race %					$\chi^2=4.57$
African-American	73 %	67%	44%	47.50%	
White	27%	33%	56%	52.50%	
Employed %	73%	53 %	56%	95 %	$\chi^2=16.39^{**}$
Marital Status (% Married)	33%	20%	44%	35%	$\chi^2=2.20$
Davidson Trauma Scale	46.7 (32.0)	72.9 (29.9)	74.7 (25.5)	10.8 (16.7)	F(3,84)= 41.6**

Note.

*
p < .05;**
p< .01

Table 3

T-Score Means and Standard Deviations for PAI Scales

Clinical Scales	PTSD M (SD)	PTSD+MDD M (SD)	PTSD+MDD++ M (SD)	Control M (SD)
Somatic Complaints (SOM)	52.9 (9.7)	60.0 (13.9)*	65.7 (12.8)*	47.3 (6.8)
Conversion (SOM-C)	51.9 (10.4)	57.1 (13.7)	64.3 (16.8)*	47.4 (7.3)
Somatization(SOM-S)	53.5 (13.1)	60.7 (13.8)*	63.9 (9.7)*	46.9 (6.7)
Health Concerns(SOM-H)	51.8 (10.0)	58.3 (13.2)	63.0 (13.2)*	48.3 (7.9)
Anxiety (ANX)	56.0 (9.1)	60.2 (12.2)*	70.9 (9.9)*	46.8 (7.7)
Cognitive (ANX-C)	56.0 (8.7)	57.7 (12.5)	69.1 (10.9)*	48.1 (8.1)
Affective (ANX-A)	57.5 (12.1)	58.8 (10.7)*	72.5 (10.3)*	46.8 (8.6)
Physiological (ANX-P)	52.5 (7.9)	61.4 (13.9)*	65.0 (9.9)*	46.5 (7.3)
Anxiety-Related Disorders (ARD)	59.5 (12.4)*	62.5 (8.4)*	76.2 (13.5)*	46.2 (9.9)
Obsessive-Compulsive (ARD-O)	52.0 (13.7)	51.5 (10.3)	61.1 (14.6)*	47.5 (10.8)
Phobias (ARD-P)	52.5 (10.2)	51.5 (9.2)	65.1 (12.2)*	46.6 (9.7)
Traumatic Stress (ARD-T)	65.1 (12.9)*	70.5 (14.3)*	79.8 (12.8)*	47.8 (8.0)
Depression (DEP)	58.3 (14.1)*	70.5 (13.9)*	75.3 (12.7)*	44.9 (7.2)
Cognitive (DEP-C)	52.3 (10.5)	62.3 (15.3)*	70.6 (15.6)*	43.2 (8.0)
Affective(DEP-A)	56.1 (14.4)	68.8 (12.4)*	71.4 (13.5)*	45.7 (6.3)
Physiological (DEP-P)	61.5 (13.0)*	69.8 (12.2)*	71.9 (9.7)*	46.1 (10.0)
Mania (MAN)	54.5 (13.4)	51.4 (12.3)	59.7 (13.8)	49.1 (10.0)
Activity Level (MAN-A)	52.7 (11.0)	49.9 (11.2)	56.7 (11.4)	46.3 (8.3)
Grandiosity (MAN-G)	54.0 (1.7)	47.1 (12.9)	51.9 (12.8)	50.7 (11.8)
Irritability (MAN-I)	53.3 (12.8)	56.2 (12.0)	63.7 (11.4)*	50.7 (11.8)
Paranoia (PAR)	54.9 (13.4)	58.6 (12.3)	64.7 (13.8)*	46.0 (10.4)
Hypervigilance (PAR-H)	56.5 (14.9)	59.0 (13.3)	64.9 (13.9)*	46.7 (12.2)
Persecution (PAR-P)	50.4 (9.2)	54.2 (9.6)	60.7 (14.6)*	45.2 (6.9)
Resentment (PAR-R)	55.5 (14.2)	58.5 (12)	61.5 (11.2)*	46.6 (10.4)
Schizophrenia (SCZ)	48.6 (6.4)	55.7 (11.3)*	66.6 (12.3)*	42.7 (8.3)
Psychotic Experiences (SCZ-P)	45.1 (7.8)	46.7 (6.7)	56.3 (10.3)*	44.3 (7.6)
Social Detachment (SCZ-S)	49.6 (7.4)	58.6 (12.2)*	63.9 (14.9)*	45.0 (7.7)
Thought Disorder (SCZ-T)	51.8 (8.9)	56.2 (11.9)*	65.8 (10.2)*	43.9 (6.8)
Borderline Features (BOR)	57.9 (12.5)	60.6 (8.0)*	66.3 (11.3)*	47.9 (8.3)
Affective Instability (BOR-A)	56.0 (12.4)	60.6 (9.3)*	66.9 (10.0)*	47.5 (8.5)
Identity Problems (BOR-I)	58.0 (10.7)	58.2 (7.2)	61.8 (17.7)*	49.0 (8.2)
Negative Relationships (BOR-N)	59.8 (15.5)	61.3 (11.1)	69.0 (12.0)*	49.2 (9.8)
Self-Harm (BOR-S)	50.2 (8.4)	52.4 (10.6)	55.4 (12.3)	46.6 (8.0)

	PTSD	PTSD+MDD	PTSD+MDD++	Control
Clinical Scales	M (SD)	M (SD)	M (SD)	M (SD)
Antisocial Features (ANT)	47.8 (6.9)	52.5 (10.2)	53.6 (10.4)	47.0 (6.6)
Antisocial Behaviors (ANT-A)	50.0 (7.2)	54.5 (11.2)	53.2 (12.1)	46.4 (7.6)
Egocentricity (ANT-E)	48.7 (10.5)	50.3 (12.1)	52.8 (9.8)	48.0 (6.9)
Stimulus Seeking (ANT-S)	45.3 (5.1)	50.1 (7.8)	52.8 (9.7)	48.6 (7.4)
Alcohol Problems	45.6 (4.5)	48.8 (6.2)	47.9 (6.9)	46.7 (6.6)
Drug Problems	50.8 (7.2)	58.5 (9.8)*	53.4 (13.0)	47.9 (6.4)
Non-Clinical Scales				
<i>Validity Scales</i>				
Inconsistency (INC)	51.2 (7.6)	56.0 (8.6)*	51.3 (7.5)	45.5 (8.7)
Infrequency (INF)	50.1 (10.7)	50.8 (7.7)	51.2 (8.5)	47.9 (6.4)
Negative Impression (NIM)	50.6 (6.5)	59.5 (9.4)*	63.1 (10.7)*	47.6 (6.1)
Positive Impression (PIM)	45.3 (10.2)	44.3 (8.4)	40.5 (8.2)*	52.2 (9.1)
<i>Treatment Scales</i>				
Aggression	52.5 (2.6)	54.8 (2.6)	53.1 (2.4)	45.7 (1.6)
Aggressive Attitude (AGG-A)	52.5 (13.4)	54.8 (9.9)	53.1 (10.3)	45.7 (8.8)
Verbal Aggression (AGG-V)	55.6 (12.9)	57.3 (11.8)	56.6 (13.2)	45.4 (3.4)
Physical Aggression (AGG-P)	58.7 (14.1)	69.4 (9.7)	66.7 (10.7)	48.6 (7.9)
Suicidal Ideation (SUI)	51.6 (13.2)	60.5 (14.1)*	60.8 (13.1)*	45.7 (9.1)
Stress (STR)	44.3 (10.3)	42.2 (7.6)*	36.0 (8.8)*	52.6 (8.8)
Nonsupport (NON)	52.5 (13.4)	54.8 (9.9)*	53.1 (10.3)*	45.7 (8.8)
Treatment Rejection (RXR)	44.3 (10.3)	42.2 (7.6)*	36.0 (8.8)*	52.6 (8.8)
<i>Interpersonal Scales</i>				
Dominance (DOM)	55.4 (2.9)	53.3 (2.9)	48.9 (2.6)	53.4 (1.8)
Warmth (WRM)	51.5 (2.4)	48.9 (2.4)	44.2 (2.2)*	55.1 (1.5)

Note:

* indicates a statistically significant difference compared to the control group at $p \leq 0.0002$.

Table 4

Pair Wise Effect sizes (Cohen's d) for PAI Scales

Clinical Scales	PTSD versus Control	PTSD+MDD versus Control	PTSD+MDD++ versus Control	PTSD versus PTSD+MDD	PTSD versus PTSD+MDD++	PTSD+MDD versus PTSD+MDD++
Somatic Complaints (SOM)	0.67	1.16	1.80	-0.59	-1.13	-0.43
Conversion (SOM-C)	0.50	0.88	1.30	-0.43	-0.89	-0.47
Somatization (SOM-S)	0.63	1.27	2.04	-0.54	-0.90	-0.27
Health Concerns (SOM-H)	0.39	0.92	1.35	-0.56	-0.96	-0.36
Anxiety (ANX)	1.09	1.32	2.72	-0.39	-1.57	-0.97
Cognitive (ANX-C)	0.94	0.91	2.19	-0.16	-1.33	-0.97
Affective (ANX-A)	1.02	1.24	2.71	-0.11	-1.33	-1.30
Physiological (ANX-P)	0.79	1.34	2.13	-0.79	-1.40	-0.30
Anxiety-Related Disorders (ARD)	1.19	1.78	2.53	-0.28	-1.29	-1.22
Obsessive-Compulsive (ARD-O)	0.36	0.38	1.06	0.04	-0.64	-0.76
Phobias (ARD-P)	0.59	0.52	1.68	0.10	-1.12	-1.26
Traumatic Stress (ARD-T)	1.61	1.96	3.00	-0.40	-1.14	-0.69
Depression (DEP)	1.2	2.31	2.94	-0.87	-1.27	-0.36
Cognitive (DEP-C)	0.97	1.56	2.21	-0.76	-1.38	-0.54
Affective (DEP-A)	0.94	2.35	2.44	-0.95	-1.10	-0.20
Physiological (DEP-P)	1.33	2.12	2.62	-0.66	-0.91	-0.19
Mania (MAN)	0.46	0.20	0.96	0.24	-0.41	-0.68
Activity Level (MAN-A)	0.66	0.37	1.04	0.25	-0.36	-0.60
Grandiosity (MAN-G)	0.26	-0.29	0.10	0.52	0.16	-0.37
Irritability (MAN-I)	0.35	0.63	1.33	-0.23	-0.86	-0.64
Paranoia (PAR)	0.74	1.11	1.53	-0.29	-0.72	-0.47
Hypervigilance (PAR-H)	0.72	0.96	1.39	-0.18	-0.58	-0.43
Persecution (PAR-P)	0.64	1.08	1.36	-0.40	-0.84	-0.53
Resentment (PAR-R)	0.72	1.06	1.38	-0.23	-0.47	-0.26
Schizophrenia (SCZ)	0.80	1.31	2.28	-0.77	-1.84	-0.92
Psychotic Experiences (SCZ-P)	0.10	0.34	1.33	-0.22	-1.23	-1.10
Social Detachment (SCZ-S)	0.61	1.33	1.59	-0.89	-1.22	-0.39
Thought Disorder (SCZ-T)	1.00	1.27	2.53	-0.42	-1.46	-0.87
Borderline Features (BOR)	0.94	1.56	1.86	-0.26	-0.70	-0.58

Clinical Scales	PTSD versus Control	PTSD+MDD versus Control	PTSD+MDD++ versus Control	PTSD versus PTSD+MDD	PTSD versus PTSD+MDD++	PTSD+MDD versus PTSD+MDD++
Affective Instability (BOR-A)	0.80	1.47	2.09	-0.42	-0.97	-0.65
Identity Problems (BOR-I)	0.94	1.19	0.93	-0.02	-0.26	-0.27
Negative Relationships (BOR-N)	0.82	1.16	1.81	-0.11	-0.66	-0.67
Self-Harm (BOR-S)	0.44	0.62	0.85	-0.23	-0.49	-0.26
Antisocial Features (ANT)	0.12	0.64	0.76	-0.54	-0.66	-0.11
Antisocial Behaviors (ANT-A)	0.49	0.85	0.67	-0.48	-0.32	0.11
Egocentricity (ANT-E)	0.08	0.23	0.57	-0.14	-0.40	-0.23
Stimulus Seeking (ANT-S)	-0.52	0.20	0.49	-0.73	-0.97	-0.31
Alcohol Problems (ALC)	-0.19	0.33	0.18	-0.59	-0.39	0.14
Drug Problems (DRG)	0.43	1.28	0.54	-0.90	-0.25	0.44
Non-Clinical Scales						
Validity Scales						
Inconsistency (ICN)	0.70	1.21	0.71	-0.59	-0.01	0.58
Infrequency (INF)	0.25	0.41	0.44	-0.08	-0.11	-0.05
Negative Impression (NIM)	0.48	1.50	1.78	-1.10	-1.41	-0.36
Positive Impression (PIM)	-0.71	-0.90	-1.35	0.11	0.52	0.46
Treatment Scales						
Aggression (AGG)	0.60	0.97	0.77	-0.20	-0.05	0.17
Aggressive Attitude (AGG-A)	0.47	0.91	0.92	-0.31	-0.27	
Verbal Aggression (AGG-V)	0.18	0.62	0.15	-0.27	0.05	
Physical Aggression (AGG-P)	0.56	0.95	0.80	-0.41	-0.36	0.06
Suicidal Ideation (SUI)	1.08	1.37	1.16	-0.14	-0.08	
Stress (STR)	0.88	2.35	1.92	-0.88	-0.64	0.26
Nonsupport (NON)	0.52	1.25	1.34	-0.65	-0.70	-0.02
Treatment Rejection (RXR)	-0.87	-1.26	-1.89	0.23	0.87	0.75
Interpersonal Scales						
Dominance (DOM)	0.20	-0.01	-0.36	0.19	0.50	0.33
Warmth (WRM)	-0.45	-0.63	-1.08	0.28	0.75	0.42

Table 5
 Similarity Matrix Based on Q-Correlations for Present Diagnostic Groups and Previously Published PAI Profiles.

	Morey	Holmes	McDevitt	Cherepon	Mozley	PTSD	PTSD+MDD	PTSD+MDD++	Control
Morey	1.00	0.80	0.56	0.88	0.96	0.66	0.84	0.92	-0.76
Holmes		1.00	0.60	0.69	0.77	0.50	0.70	0.79	-0.44
McDevitt			1.00	0.42	0.56	0.54	0.50	0.63	-0.18
Cherepon				1.00	0.83	0.62	0.82	0.84	-0.69
Mozley					1.00	0.56	0.81	0.91	-0.82
PTSD						1.00	0.79	0.75	-0.22
PTSD+MDD							1.00	0.87	-0.54
PTSD+MDD++								1.00	-0.64
Control									1.00

Note. Morey = Morey (1996); Holmes = Holmes et al (2001); McDevitt = McDevitt et al. (2005), Cherepon = Cherepon & Prinzhorn (1994); Mozley = Mozley et al. (2005)