

## **MMPI Profiles of Acute and Chronic PTSD in a Civilian Sample**

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*In a treatment setting, a group of 165 subjects presenting with either acute or chronic posttraumatic stress disorder (PTSD) were compared to 72 subjects presenting with panic disorder only in order to determine whether the MMPI PTSD assessment strategy developed with Vietnam veterans could be validly used with civilians. Results indicated that the MMPI profile, codetype, diagnostic decision rule, and PK scale developed with samples of Vietnam veterans did not apply well to civilians, especially those presenting with acute PTSD. It is thus recommended that specific assessment strategies be developed for these populations.*

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A review of the studies that have used the Minnesota Multiphasic Personality Inventory (MMPI form R; Hathaway & McKinley, 1970) to assess posttraumatic stress disorder (PTSD) points to both a specific profile configuration (F-8-2) and a scale indicative of this disorder (PK) (Wilson & Walker, 1990). Developed with a population of inpatient male veterans from the Vietnam war presenting with combat-related chronic PTSD, it is yet unclear whether the reported MMPI PTSD profile and scale apply to other groups of patients who have been exposed to traumatic events, such as civilians. Furthermore, there is no evidence that these findings apply to patients presenting with acute PTSD, a population for whom no data are currently available. Because of the widespread use of the MMPI for diagnostic purposes in clinical and forensic settings, the issue of the generalizability of the MMPI PTSD assessment strategy has not received the attention it deserves.

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### Vietnam Veterans and the MMPI

Vietnam veterans with chronic PTSD typically yield a MMPI profile in which the F validity scale is unusually elevated (*T* scores varying from 70 to above 90) and the F minus K index is high, indicating either psychopathology or an attempt at faking it. Moderate to marked elevations (*T* scores above 70) on most clinical scales are observed, except for the *Mf* (5), *Ma* (9), and *Si* (0) scales which are in the normal range. The mean profile is further characterized by peak scores on the Schizophrenia (*Sc*, 8) and Depression (*D*, 2) scales, also referred to by the codetype 8-2. These results have been obtained by various researchers in different settings (for a review, see Wilson & Walker, 1990), notably by Fairbank, Keane, and Malloy (1983), and by Keane, Malloy, and Fairbank (1984). Only a few exceptions to this pattern have been noted among veterans (e.g., Archibald & Tuddenbaum, 1962; Penk et al., 1981).

Extending on these findings on the MMPI PTSD profile, Keane et al. (1984) classified correctly 74% of a sample of 100 Vietnam veterans with combat-related chronic PTSD and 100 non-PTSD psychiatric inpatients, by combining *T* scores of  $F > 66$ ,  $D > 78$  and  $Sc > 79$  for a PTSD diagnostic decision rule. Moreover, by means of a chi-square analysis performed on each of the 399 items of the MMPI, they created the 49-item Keane MMPI PTSD scale, now relabeled the PK scale. With the optimal cutoff score set at 30, they correctly classified 82% of the total sample using this scale. In reviewing six replication studies (Cannon, Bell, Andrews, & Finkelstein, 1987; Gayton, Burchstead, & Matthews, 1986; Hyer et al., 1986; Orr et al., 1990; Vanderploeg, Sison, & Hickling, 1987; Watson, Kucala, & Manifold, 1986), Watson (1990) found an acceptable median hit rate of .70 for the PK scale used with Vietnam veterans, using cutoff scores varying from 8.5 to 25. Some of these hit rates were inflated, however, by high specificity in contrast to low sensitivity.

### Traumatized Civilians and the MMPI

Whether the MMPI PTSD assessment norms outlined above do apply to civilians with PTSD is not yet ascertained. Of the five studies that have investigated the question, four (Frederick, 1985; Koretzky & Peck, 1990; McCaffrey, Hickling, & Marrasso, 1989; Wilson & Walker, 1990) found a MMPI PTSD profile somewhat similar to the one outlined with veterans with a trend toward less elevated *T* scores. The fifth study (Chaney, Williams, Cohn, & Vincent, 1984) failed to replicate the F-8-2 codetype in their traumatized group.

Although the weight of evidence seems to support the hypothesis that Vietnam veterans and civilians share the same trauma profile, these five studies have all important shortcomings. One of them included trauma patients with a subthreshold PTSD diagnostic status (Frederick, 1985), others used patients involved in litigation (Wilson & Walker, 1990), or patients assessed primarily from a clinical point of view (Chaney et al., 1984; McCaffrey et al., 1989). Most studies had relatively small sample sizes. Hence, no firm conclusion can be drawn about the MMPI profile of civilians with PTSD from these studies. In addition, none of these studies included acute PTSD patients.

With respect to the PK scale, only two studies have reported on its use in civilian samples. Sloan (1988) found that the means of the PK scale at 1, 2, and 5 months posttrauma equalled 13.8 ( $SD = 9.6$ ), 6.4 ( $SD = 4.8$ ), and 11.3 ( $SD = 12.3$ ), respectively. After 10 and 12 months, the mean scores were 6.1 and 9.5, respectively. These results are even lower than those observed for the non-PTSD comparison group in Keane et al.'s study (1984). These findings could be due to the fact that only 54% of the subjects met DSM-III diagnostic criteria for PTSD at the onset of Sloan's study, while only 10-15% may still have met the criteria after 12 months. Moreover, only 8 of the 30 subjects remained in the study for its whole duration, opening the door to various biases.

Koretzky and Peck's study (1990) represents the most serious attempt to validate the PK scale with a sample of civilian traumatized subjects. With this scale, they correctly classified 89% of the PTSD group and 85% of the psychiatric control group for an overall diagnostic hit rate of 87%. In the cross-validation sample the hit rate was 88%. As for the MMPI PTSD decision rule employed by Keane et al. (1984), it was shown to lack sensitivity, correctly classifying only 39% of the PTSD subjects of the original sample and 53% of them in the cross-validation sample. Although this replication study showed that the MMPI PTSD decision rule lacks sensitivity, it suggested that the PK scale could be useful in the assessment of civilians with PTSD. Unfortunately, it is unknown whether Koretzky and Peck's study was conducted with acute or chronic PTSD patients, rendering the data difficult to interpret.

Hence, even if there is some preliminary evidence suggesting that the MMPI PTSD profile configuration, the PK scale and the PTSD decision rule could apply to civilians with chronic PTSD, these findings have not received strong support and deserve to be replicated under improved methodological conditions.

### The Present Study

The present study attempted to test whether the findings obtained essentially with Vietnam veterans can be replicated in a civilian sample of patients presenting acute or chronic PTSD. It was expected that: (1) Acute and chronic PTSD subjects would present a similar but less elevated MMPI profile than the one usually observed in traumatized veterans, that is, an F-8-2 profile. (2) MMPI scores associated with acute PTSD would be lower than those of chronic PTSD, given that MMPI scores tend to increase as psychopathology augments (Greene, 1991).

For the purpose of testing the discriminant power of both the PK scale and the MMPI PTSD decision rule, a third non-PTSD comparison group of subjects was employed, one presenting with Panic Disorder only. The rationale for the selection of the latter comparison group was that a powerful assessment strategy should be able to distinguish between PTSD patients and patients having a related disorder, such as another anxiety disorder. No specific hypotheses were elaborated with respect to these comparisons. Finally, it was examined whether MMPI scores of acute and chronic PTSD subjects varied according to gender, duration of PTSD symptoms, co-morbidity, and types of traumatic events. These potentially confounding variables could explain any differences found between our sample and traumatized Vietnam veterans.

### Method

#### *Subjects*

A total of 237 subjects were part of this study. All subjects signed an informed consent form in which they agreed that their test results could be used for research purposes. The Acute PTSD group ( $n = 98$ ) was comprised of 24 men (25%) and 74 women (75%) presenting with a PTSD duration of less than 6 months duration. Their mean age was 36.6 years old ( $SD = 11.6$ ), and the mean duration of their PTSD symptoms was 6.4 weeks ( $SD = 5.3$ ) with a range of 4 to 25 weeks. The Chronic PTSD group ( $n = 67$ ) included 26 men (39%) and 41 women (61%) presenting with a PTSD of at least 6 months duration. Their mean age was 37.0 years old ( $SD = 10.6$ ), and the mean duration of their PTSD symptoms was 78.1 weeks ( $SD = 65.0$ ) with a range of 26 to 312 weeks. PTSD diagnoses were made by an experienced clinical psychologist using the Structured Clinical Interview for DSM-III-R (SCID; Spitzer & Williams, 1985), and they were subsequently confirmed by the treating psychologists.

Patients from these two groups were all seeking treatment in a private outpatient clinic specialized in treating PTSD which is directed by the senior author. None of the PTSD subjects were involved in litigation at the time of treatment. They had been victims of one of the following traumatic events: an armed robbery (44%); a physical assault (32%); a sexual assault (6%); an armed robbery plus being taken hostage (2%); serious death threats (1%); or other types of traumatic events (14%). Most diagnoses of co-morbidity were of major depressive disorder (MDD), panic disorder, and agoraphobia. In the Acute PTSD group, 30% of the subjects had more than one psychiatric diagnosis: 10% with MDD; 18% with panic disorder; and 14% with agoraphobia. In the Chronic PTSD group, this figure amounted to 58%: 36% with MDD; 31% with panic disorder; and 22% with agoraphobia. A percentage difference was observed between the acute and chronic PTSD groups only with respect to the presence of MDD or not ( $t = 14.4, p < .001$ ). Clearly observable personality or dissociative disorders were also identified by both the evaluator and the psychotherapist; with 2% in the acute PTSD group, and 9% in the chronic PTSD group.

The control group composed of individuals presenting with a Panic Disorder ( $n = 72$ ) included 45 women (62%) and 27 men (38%) meeting the DSM-III-R (American Psychiatric Association, 1987) criteria for this disorder. Their mean age was 37.3 years old ( $SD = 8.8$ ). These subjects originally scored the MMPI within the context of a study of the physiologic reaction of individuals with panic disorder; therefore, they represented a non treatment-seeking sample.

### *Measure*

The measure employed was the short version of the Minnesota Multiphasic Personality Inventory (MMPI-1, form R; Hathaway & McKinley, 1970) which contains 399 items. *T* scores were calculated for the three validity scales (L, F, and K), as well as for the 10 clinical scales: Scale 1 (Hypochondriasis, Hs), Scale 2 (Depression, D), Scale 3 (Hysteria, Hy), Scale 4 (Psychopathic Deviate, Pd), Scale 5 (Masculinity-Femininity, Mf), Scale 6 (Paranoia, Pa), Scale 7 (Psychasthenia, Pt), Scale 8 (Schizophrenia, Sc), Scale 9 (Hypomania, Ma), and Scale 0 (Social Introversion, Si). As suggested by Greene (1991), individual and mean codetypes were identified by selecting the two scales with the highest elevations above a *T* score of 70. For means of comparisons with other studies (e.g., Keane et al., 1984), the K correction was applied to five clinical scales. Finally, PK scores were computed using the guidelines provided by Keane et al. (1984).

## Results

### *Means and Profiles of MMPI Scales*

Fourteen analyses of variance (ANOVAs) were conducted using each of the MMPI scale scores (including the PK scale) as the dependent variable and the group factor as the independent variable. Because of the numerous ANOVAs performed, the Bonferonni adjusted probability level was set at  $p < .05 + 14 = .0035$ , for these analyses, as well as for all subsequent ones.

The ANOVAs revealed significant differences on the F validity scale, 5 of the 10 standard MMPI clinical scales, and the PK scale: F ( $F[2,234] = 16.88, p < .0001$ ), Hs ( $F[2,234] = 5.56, p < .005$ ), D ( $F[2,234] = 8.83, p < .0005$ ), Pa ( $F[2,234] = 14.52, p < .0001$ ), Pt ( $F[2,234] = 6.32, p < .005$ ), Sc ( $F[2,234] = 11.88, p < .0001$ ), and PK ( $F[2,234] = 9.94, p < .001$ ). The means and standard deviations of the three groups are presented in Table 1. Newman-Keuls *post-hoc* comparisons were conducted on all significant ANOVAs, indicating that the chronic PTSD group scored significantly higher than both the acute PTSD and panic disorder groups ( $p < .05$ ), with no significant differences between the latter groups. The groups' MMPI profiles are illustrated in Figure 1, along with the results obtained by Keane et al. (1984) for comparison purposes.

The mean *T* scores of the acute PTSD and panic disorder groups fell just above the normal range (*T* below 70) for seven clinical scales, while a substantial elevation can be observed on the D (2) scale. In the chronic PTSD group, the trend was toward more psychopathology, with means between 75 and 80 on the Hs (1), Hy (3), Pd (4), Pa (6), and Pt (7), as well as means close to 85 on the D (2) and Sc (8) scales.

For the acute PTSD group, if the D (2) scale clearly stood out as the most elevated scale (76.5), however, the second place was dispersed among six elevated scales. These scales' averages were just above the edge of the normal range (from 69.6 to 72.6), and their standard deviations were large (from 9.3 to 15.4). The problem of selecting the second highest scale did not arise for the Chronic PTSD group; the D (2) scale was the most elevated one (85.8), and the Sc (8) scale was clearly the second most elevated one (84.5). For the panic disorder group, the highest scale was also D (2) (80.7), with five other elevated clinical scales competing for the second place (from 71.0 to 73.8).

Table 1. MMPI Scale Means and Standard Deviations for Acute PTSD, Chronic PTSD, and Panic Disorder Groups

	MMPI Scales													PK Scale		
	L	F	K	Hs	D	Hy	Pd	Mf	Pa	Pt	Sc	Ma	Si			
<b>Acute PTSD</b>																
<i>M</i>	55.3	68.5	53.7	71.7	76.5	70.8	71.5	51.4	69.6	71.2	72.6	59.8	60.6	19.2		
<i>SD</i>	7.5	13.4	9.7	10.2	13.6	9.3	12.1	12.8	12.7	13.7	15.4	10.5	10.3	10.3		
<b>Chronic PTSD</b>																
<i>M</i>	54.4	78.6	49.5	78.5	85.8	75.9	76.5	56.6	78.1	79.0	84.5	61.3	65.7	25.7		
<i>SD</i>	7.1	16.0	7.7	16.6	14.2	13.0	12.6	13.6	15.2	14.1	18.0	10.0	9.4	9.9		
<b>Panic disorder</b>																
<i>M</i>	51.1	65.5	52.2	73.5	80.7	72.8	71.0	54.8	66.5	73.7	73.8	59.0	62.0	19.6		
<i>SD</i>	8.0	12.2	8.0	13.1	14.3	10.8	12.1	15.0	11.4	14.4	15.5	11.3	10.9	9.2		

### *Individual MMPI Codetypes*

In the acute PTSD group, one third of the subjects showed a F score superior to 70 while two thirds scored at a subthreshold level. As far as the clinical scales are concerned, 12% of the subjects presented a modal (most frequent) codetype of 2-4/4-2. The 2-8/8-2 codetype — the one most frequently observed in Vietnam veterans — was endorsed by 5% of the subjects only. Apart from the 2-4/4-2 and 2-8/8-2 codetypes, another 24% of the Acute PTSD subjects had a codetype involving the D (2) scale. Thirty-six percent of the subjects had other codetypes, while the remainder (23%) presented either no identifiable codetype, an elevation on one scale only, or no clinically elevated scale.

In the chronic PTSD group, 60% of the subjects showed a F score greater than 70 while 40% scored below that threshold. Among the clinical scales, the modal codetypes were 2-1/1-2 (14%), 2-8/8-2 (14%), and with 4-8/8-4 (14%). Another 21% had the D (2) scale as one of their two highest scales. Twenty-three percent of the subjects had another codetype, while other subjects (14%) presented either no identifiable codetype, an elevation on one scale only, or no clinically elevated scale.

In the panic disorder group, the modal codetype was the 8-2/2-8 codetype (13%), closely followed by the 2-7/7-2 codetype (11%). Another 15% of the subjects had the D (2) scale as their highest or second highest scale. Thirty percent of the subjects had another codetype. Others (21%) had either no identifiable codetype, an elevation on one scale only, or no clinically elevated scale.

It could be argued that the failure to find a clear 8-2/2-8 codetype in the PTSD groups, as with the veterans samples, stems not from the military/civilian distinction, but other factors such as having a predominantly outpatient female sample, with less chronicity, differing co-morbidity on Axis I and II, and victims of various types of traumatic events. Therefore, additional analyses were performed in order to investigate these hypotheses.

### *Gender*

Independent groups *t*-tests were conducted for each of the MMPI scales as the dependent variable and gender as the independent variable. Analyses revealed that males had higher mean scores than females on the Hs (1) ( $t[163] = 3.71, p < .001$ ), D (2) ( $t[163] = 3.11, p < .001$ ), and Pt (7) ( $t[163] = 3.41, p < .002$ ) scales, and almost significantly higher means on the Sc (8) scale ( $t[163] = 2.67, p = .008$ ). Males also scored higher on the *Mf* scale ( $t[163] = 10.47, p < .003$ ), however, this gender difference is considered normal according to Greene (1991) because males generally



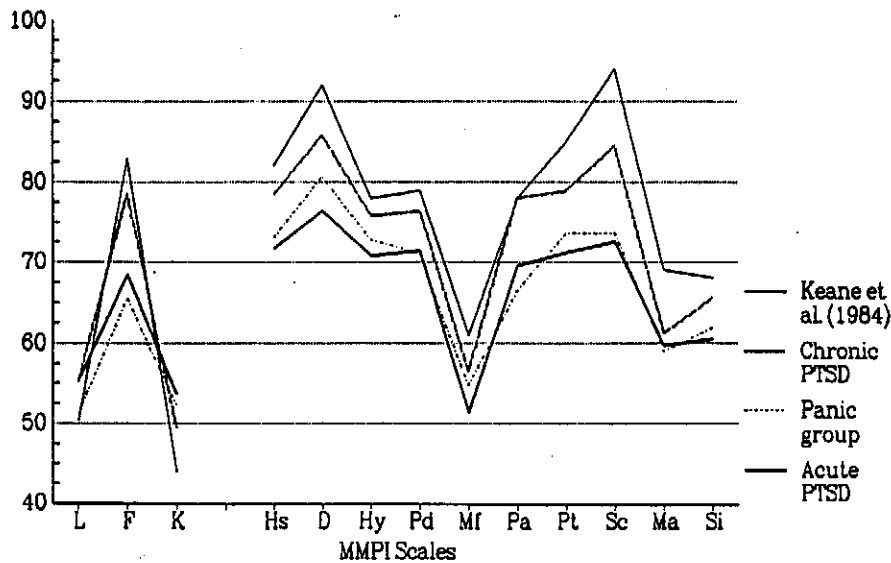


Figure 1. MMPI profiles of civilians with Acute PTSD, Chronic PTSD and Panic Disorder, and of Vietnam veterans with chronic PTSD.

score substantially higher on this scale in the population at large. The mean profile produced by men was more similar to the mean profile reported for the chronic PTSD group (see Figure 1), while the mean profile presented by women was more similar to the one of the Acute PTSD group. When a chi-square analysis was computed to verify whether proportions of men and women were equal in the acute and chronic PTSD groups, no significant difference was obtained but a trend emerged with more men present in the chronic PTSD group. For both genders, the D (2) scale was the most elevated one, with the Sc (8) scale in the second place.

### Chronicity

To better compare our results with those reported previously, the chronic PTSD group was divided into two categories: more recent chronic PTSD (duration of 6 months to 2 years;  $M = 48$  weeks,  $SD = 23$ ), and more long-lasting chronic PTSD (duration of more than 2 years;  $M = 178$  weeks,  $SD = 62$ ). *T*-tests were conducted for each of the MMPI scales as the dependent variable and type of chronicity as the independent variable. As a result, no significant differences between two types of chronicity was observed.

### *Comorbidity*

The most frequent diagnoses to co-occur within our PTSD samples were panic disorder (24%), MDD (21%), and agoraphobia (18%). Three sets of *t* tests were conducted for each of the MMPI scales as the dependent variable and each of those co-occurring disorders as the independent variable. No significant difference was obtained between the PTSD plus panic disorder group versus the PTSD without panic disorder group. Negative results were also observed for the PTSD plus agoraphobia group versus the PTSD without agoraphobia group, except for the PK and Si (0) scales where agoraphobic subjects showed higher scores. This latter significant difference simply indicated that agoraphobic patients report themselves as staying away from social contacts more than patients without agoraphobia.

Significant differences were found, however, when the presence or absence of MDD divided the PTSD subjects. Those with MDD presented higher scores on the F, Hs (1), D (2), Hy (3), Pa (6), Pt (7), Sc (8), and Si (0). The profile configuration of the PTSD subjects with MDD was found to be remarkably similar to the profile of the chronic PTSD group. In contrast, the profile of the PTSD subjects without MDD was found to be of striking resemblance to the one of the acute PTSD group. As previously mentioned, only 10% of the acute PTSD subjects presented with MDD, while 36% of the Chronic PTSD subjects had also MDD. Moreover, PTSD subjects with MDD presented an average codetype of F-2-8 and a mean PK score of 27.5, which is similar to the average MMPI profile presented by Vietnam veterans.

### *Personality and Dissociative Disorders*

Independent groups *t* tests were conducted for each of the MMPI scales as the dependent variable and the presence or absence of either a personality disorder or a dissociative disorder as the independent variable. Analyses revealed that patients with a personality and/or dissociative disorder produced higher mean scores than those without such conditions on the Sc (8) scale ( $t[163] = 3.56, p < .0035$ ; 98.1 versus 76.4) and almost on the F ( $t[163] = 2.83, p = .005$ ; 87.3 versus 71.2) and PK ( $t[163] = 2.93, p = .0039$ ; 32.3 versus 21.3) scales. It is of interest to note that 2% of the patients in the acute PTSD group presented a clear personality and/or dissociative disorder, while 9% of the chronic PTSD group had such a condition, but this difference was not found to be significant.

*Type of Traumatic Events*

To produce higher frequencies of types of traumatic events, the eight aforementioned categories were collapsed into three: hold-ups, being taken hostage, or death threats; physical or sexual assaults; and accidents, witnessing an accident or witnessing an assault. ANOVAs were performed as for the previous analyses. No significant differences were observed except for the *Mf* (5) scale where those who had suffered a hold-up or death threats had less elevated scores than those who had experienced an assault or accident, or had been a witness of such event. However, the means of the three groups on the *Mf* (5) scale were all between 50 and 60, that is, a normal range.

*Classifying PTSD*

Having explored the profile of the PTSD groups and subgroups, the next step was to test whether the MMPI PTSD decision rule used by Keane et al. (1984) to classify PTSD subjects ( $F > 66$ ,  $D > 78$ , and  $Sc > 79$ ) could be applied to our sample. The decision rule classified correctly only 18% of the acute PTSD subjects and 55% of the chronic PTSD subjects.

With regard to the *PK* scale, the chronic PTSD group scored an average of 25.7, in comparison to the acute PTSD subjects who scored 19.2 and the panic disorder group who produced a score of 19.6. The cutoff score of 30 used by Keane et al. (1984) correctly classified only 18% of the acute PTSD subjects and 42% of the chronic PTSD subjects as true positives, and 83% of the panic disorder subjects as true negatives. Stated otherwise, a contingency table including the acute PTSD and panic disorder groups yielded a sensitivity of .18 and a specificity of .83, for a hit rate of .46. Similarly, a contingency table with the chronic PTSD and panic disorder groups provided a sensitivity of .42 and a specificity of .83, for a hit rate of .63.

Because other researchers have tended to use optimal cutoff scores instead of the suggested score of 30, additional analyses were conducted with a cutoff score of 16, which seemed to be most discriminating. For the acute PTSD group, this procedure yielded a sensitivity of .63 and a specificity of .33, for a hit rate of .51. For the chronic PTSD group, the sensitivity was .88 and the specificity was .33, for a hit rate of .60.

### Discussion

The results of this study indicate that the MMPI assessment strategy developed with Vietnam veterans presenting with very chronic PTSD is not well suited for assessing civilians presenting with neither acute nor chronic PTSD. First, the 8-2/2-8 mean codetype was not frequently observed in those two PTSD samples, with only 5% in the acute PTSD group and 14% in the chronic PTSD group. Second, the MMPI PTSD decision rule was not very successful at correctly classifying subjects, identifying only 18% of acute PTSD patients and 55% of chronic PTSD patients. Our findings replicated Koretzky and Peck's (1990) results, who did not advocate the use of the MMPI PTSD decision rule among civilians who are victims of traumatic events. Third, the PK scale yielded modest to moderate hit rates, between .43 and .63 depending on the cutoff score employed, with both types of PTSD. Fourth, MMPI scores differed from the control group only for the chronic PTSD subjects; they consistently scored higher than the acute and panic groups on several MMPI scales. Interestingly, MMPI scores of the acute PTSD subjects were similar to those presented by subjects with a panic disorder, and six of the seven clinical scales elevated in the Acute PTSD group scored just around 70. Furthermore, the presence of a panic disorder as a co-morbid condition of PTSD had no impact on MMPI scores. Taken together, those findings tend to suggest that acute PTSD is a psychological condition which is similar to other anxiety disorders, while chronic PTSD may resemble more severe types of psychopathology.

The D scale (2) was frequently observed to be the highest or second highest (54-57%) of the 10 standard MMPI clinical scales in both acute and chronic PTSD groups, although it also characterized the Panic Disorder group (56%). Apart from D scale, it proved difficult to isolate the second highest scale for any group. An inspection of the individual code-types, revealed that only 5-14% of the subjects displayed an 8-2/2-8 codetype. The modal individual codetype was found to be 2-4/4-2 in the Acute PTSD group, and 2-8/8-2 in both the Chronic PTSD and Panic Disorder groups. In the Chronic PTSD group, two additional modal individual code-types were also observed, 1-2/2-1 and 4-8/8-4. Because of the immense variability within groups, the search for a typical MMPI PTSD profile, either acute or chronic, appears to have been unsuccessful.

In comparison to Vietnam veterans, the usual 8-2/2-8 codetype was not frequently observed in civilian subjects presenting with either acute and chronic PTSD. Because our samples differed from the one of Keane et al. (1984) on gender, chronicity, co-morbidity, and types of traumatic events experienced, additional analyses were performed to examine the impact of these factors on MMPI scores.

Males produced higher scores on Hs (1), D (2), Mf (5), and Pt (7) scales, and almost significantly higher scores on the Sc (8) scale. While the Mf scale is expected to be higher for males than females (Greene, 1991), the higher elevations observed on scales Hs, D, Pt, and Sc could be relevant to the discrepancy between our findings and the ones obtained in veterans samples composed of males only. Nonetheless, such elevations have also been observed in chronically traumatized patients, which could explain the differences observed between males and females in our sample. As in any other outpatient setting, the male subjects showed difficulties in consulting specialized services for treating their psychological trauma and they consulted mostly when their condition was already chronic. This tendency could thus explain the above findings.

There was no difference in MMPI scores between recent and long-lasting chronicity of PTSD. Therefore, the duration of chronic PTSD symptoms could not explain the discrepancy between our results and those observed with Vietnam veterans. However, the duration of the longer-lasting chronic PTSD symptoms was quite limited in our sample in comparison to the one experienced by Vietnam veterans. Moreover, a lack of association was also obtained when types of traumatic events were considered as a potentially confounding variable. But again, the repeated and prolonged traumatic events experienced by Vietnam veterans may somewhat differ from those experienced by civilians who are victims of crimes.

When co-morbidity consisted of a major depression disorder, it appeared to be a better explanatory factor. PTSD subjects with this concurrent diagnosis produced more elevated MMPI scores on most of the clinical scales found to be elevated in samples of veterans. Moreover, the average codetype associated with this subsample was F-2-6, and almost F-2-8, the latter being the most frequent codetype observed in veterans. It may be that very chronic PTSD, coupled with MDD, produces results similar to the ones observed in veterans, as most chronically traumatized Vietnam veterans are also depressed (Boscarino, 1995). Furthermore, when clearly identifiable personality or dissociative disorders were considered, it was found that these patients produced more elevated scores on the Sc (8) scale, and almost on the F and PK scales. This variable thus appears to have bearing on the MMPI scores of traumatized individuals.

Although no reliable mean or individual codetype was found, an examination of the mean MMPI profile of the groups yields some interesting information, as shown in Figure 1. On the left hand side of the profile, the neurotic triad on Hs, D, and Hy scales (1-2-3) forming an inverted "V" was elevated for the Acute PTSD, Chronic PTSD, and Panic Disorder groups, although it was significantly more elevated in the Chronic PTSD group. According to Greene (1991), this pattern is usually associated with

mixed symptoms of depression, anxiety, and somatic complaints. Patients with this configuration feel overcontrolled and bottled-up. They are in self-doubt, display low levels of efficiency, and feel great unhappiness and discomfort. Moreover, an elevated Pd scale (4) may relate to a general social maladjustment, and a brooding resentment and anger toward authority figures, especially in chronic PTSD. It is thus suggested that these feelings, symptoms, and attitudes are shared by most PTSD patients, whether they are in an acute or chronic state. Nonetheless, these reported reactions are also shared by patients with panic disorder.

On the right hand side of the MMPI profile, scores were higher for the Chronic PTSD group, in comparison to the Acute PTSD and Panic Disorder groups; that is, between 75 and 85 on the Pa (6), Pt (7), and Sc (8) scales. Therefore, as PTSD became chronic, the impact of trauma upon thinking, perception, and suspiciousness was revealed by these higher elevations (Greene, 1991). In Figure 1, it can be seen that the slope of the ascending line between the Pa (6) and Sc (8) scales increased from the Acute PTSD group, to the Chronic PTSD group, to the Vietnam veterans with PTSD group (Keane et al., 1984), possibly reflecting the alienated experience of individuals who have lived with chronic PTSD for a prolonged period of time, and/or the experience of traumatized individuals who have been ostracized by their society as were Vietnam veterans upon their return from the war. Furthermore, most of the samples of traumatized Vietnam veterans consisted of inpatients, who tend generally to obtain more elevated scores on the MMPI due to their more severe psychopathology (Greene, 1991), a factor which could also explain the discrepancy between our findings and theirs.

The present study has, consequently, limitations. Results were observed in a treatment-seeking sample of PTSD patients in an outpatient setting, which renders the observed findings generalizable only to such patients. In contrast, the comparison group was recruited in a hospital setting for scientific purposes only, a selection procedure which may have also induced a bias. Finally, the majority of subjects included in this study were victims of crimes (86%), and the others were either victims or witnesses of severe accidents or assaults at work where human negligence was involved. It would be of interest to test whether the MMPI assessment strategy developed with Vietnam veterans could be successfully employed with other types of populations such as refugees who were victims of political crimes.

In conclusion, having been unable to replicate the 8-2/2-8 profile in the Acute PTSD group, it is not surprising to find that the rest of the usual MMPI assessment strategy for diagnosing PTSD (the PTSD decision rule and the PK scale) could not correctly classify a satisfactory number of acute

PTSD subjects. Although those strategies were more successful in the Chronic PTSD group, they remained unsatisfactory overall. These findings thus point to the need for developing new MMPI PTSD scales to diagnose both acute and chronic PTSD in civilian populations. The present findings are congruent with the conclusions of Penk et al. (1989) who have argued that there is a need for the development of a family of PTSD scales on the MMPI. Therefore, until more studies are conducted on the MMPI profile of civilians with PTSD, it is suggested that clinicians and forensic workers dealing with civilians presenting with PTSD do not rely on the assessment strategies developed with Vietnam veterans.

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#### References

- American Psychiatric Association (1987). *Diagnostic and statistical manual of mental disorders* (3rd ed., rev.). Washington, DC: Author.
- Archibald, H.G., & Tuddenbaum, R.D. (1965). Persistent stress reaction after combat: A 20-year follow-up. *Archives of General Psychiatry*, *12*, 475-481.
- Boscarino, J.A. (1995). Posttraumatic stress and associated disorders among Vietnam veterans: The significance of combat exposure and social support. *Journal of Traumatic Stress*, *8*, 317-336.
- Cannon, D.S., Bell, W.E., Andrews, R.H., & Finkelstein, A.S. (1987). Correspondence between MMPI PTSD measures and clinical diagnosis. *Journal of Personality Assessment*, *51*, 517-521.
- Chaney, H.S., Williams, S.F., Cohn, C.K., & Vincent, K.R. (1984). MMPI results: A comparison of trauma victims, psychogenic pain, and patients with organic disease. *Journal of Consulting and Clinical Psychology*, *40*, 1450-1453.
- Fairbank, J.A., Keane, T.M., & Malloy, P.F. (1983). Some preliminary data on the psychological characteristics of Viet Nam veterans with posttraumatic stress disorders. *Journal of Consulting and Clinical Psychology*, *6*, 912-919.
- Frederick, C.J. (1985). Children traumatized by catastrophic situations. In S. Eth & R.S. Pynoos (Eds.), *Post-traumatic stress disorder in children* (pp. 71-99). Washington DC: American Psychiatric Press.
- Gayton, W.F., Burchstead, G.N., & Matthews, G.R. (1986). An investigation of the utility of an MMPI post-traumatic stress disorder subscale. *Journal of Clinical Psychology*, *42*, 916-917.
- Greene, R.L. (1991). *The MMPI-2/MMPI: An interpretative manual*. Boston, MA: Allyn and Bacon.
- Hathaway, S.R., & McKinley, J.C. (1970). *Minnesota Multiphasic Personality Inventory*. New York: Psychological Corporation.

- Hyer, L., O'Leary, W.C., Saucer, R.T., Blount, J., Harrison, W.R., & Boudewyns, P.A. (1986). Inpatient diagnosis of posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology, 54*, 698-702.
- Keane, T.M., Malloy, P.F., & Fairbank, J.A. (1984). Empirical development of an MMPI subscale for the assessment of combat-related post-traumatic stress disorder. *Journal of Consulting and Clinical Psychology, 52*, 888-891.
- Koretzky, M.B., & Peck, A.H. (1990). Validation and cross-validation of the PTSD subscale of the MMPI with civilian trauma victims. *Journal of Clinical Psychology, 46*, 296-300.
- McCaffrey, R.J., Hickling, E.J., & Marrasso, M.J. (1989). Civilian-related post-traumatic stress disorder: Assessment related issues. *Journal of Clinical Psychology, 45*, 72-75.
- Orr, S.P., Claiborn, J.M., Altman, B., Forgue, D.F., de Jong, J.B., Pitman, R.K., & Herz, L.R. (1990). Psychometric profile of PTSD, anxious and healthy Vietnam veterans: Correlations with psychophysiological responses. *Journal of Consulting and Clinical Psychology, 58*, 329-335.
- Penk, W., Robinowitz, R., Black, J., Dolan, M., Bell, W., Roberts, W. R., & Skinner, J. (1989). Co-morbidity: Lessons learned about post-traumatic stress disorder (PTSD) from developing PTSD scales for the MMPI. *Journal of Clinical Psychology, 45*, 709-717.
- Penk, W.E., Robinowitz, R., Roberts, W.R., Paterson, E.T., Dolan, M.P., & Atkinson, R.M. (1981). Adjustment differences among male substance abusers varying in degree of combat experience in Vietnam. *Journal of Consulting and Clinical Psychology, 49*, 426-437.
- Sloan, P. (1988). Post-traumatic stress in survivors of an airplane crash-landing: A clinical and exploratory research intervention. *Journal of Traumatic Stress, 1*, 211-229.
- Spitzer, R.L., & Williams, J.B. (1985). *Structured Clinical Interview for the DSM-III-R*. New York: New York State Psychiatric Institute, Biometrics Research Department.
- Vanderploeg, R.D., Sison, G.F.P., & Hickling, E.J. (1987). A reevaluation of the use of the MMPI in the assessment of combat-related posttraumatic stress disorder. *Journal of Personality Assessment, 51*, 140-150.
- Watson, C.G. (1990). Psychometric posttraumatic stress disorder measurement techniques: A review. *Psychological Assessment, 2*, 460-469.
- Watson, C.G., Kucala, T., & Manifold, V. (1986). A cross-validation of the Keane and Penk MMPI scales as measures of post-traumatic stress disorder. *Journal of Clinical Psychology, 42*, 727-732.
- Wilson, J.P., & Walker, A.J. (1990). Toward an MMPI trauma profile. *Journal of Traumatic Stress, 3*, 151-168.