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Post-Traumatic Stress Disorder in Vietnam Veterans: An Experimental Validation of the DSM-III Diagnostic Criteria

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The DSM-III criteria for post-traumatic stress disorder (PTSD) were derived clinically and have been substantiated in the literature only by self-report data while evaluation of these same criteria with more objective measures has been overlooked. This study provided a laboratory-based evaluation of the DSM-III criterion symptoms of PTSD with six symptoms of the disorder which were operationalized as cognitive, behavioral and psychophysiological measures. The responses of 16 Vietnam combat veterans who met the criteria for a PTSD diagnosis were compared to those of 16 well-adjusted combat veterans without PTSD. Dependent measures were obtained twice, following exposure to first control and then combat auditory stimuli. Results showed that five of the six measures were effective in differentiating the two combat veteran groups. These findings provided experimental support and construct validity for five DSM-III criteria of PTSD. The implications of these findings for the DSM-III-R PTSD diagnostic criteria are discussed.

KEY WORDS: PTSD, DSM-III-R criteria; construct validity.

INTRODUCTION

The introduction of post-traumatic stress disorder (PTSD) to the psychiatric nomenclature in 1980 (Diagnostic and Statistical Manual DSM-III APA) significantly advanced the recognition of traumatic experience as a causal factor in the development of psychopathology. Conceptual and

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methodological reformulations launched a plethora of studies aimed at understanding the thousands of Vietnam combat veterans suffering from the psychological aftereffects of war. The systematic study of PTSD symptomatology using new assessment methods (Kulka *et al.*, 1988) and treatment protocols (Keane *et al.*, 1989) has steadily expanded our understanding.

Seven years of rapid literature development was incorporated into the DSM-III revision where some of the original PTSD symptom criteria were reconsidered (DSM-III-R; APA, 1987). In this revision, several original symptoms were excluded (e.g., memory impairment and survivor guilt) and other symptoms were added (e.g., sense of foreshortened future and anger outbursts). The 1987 revision and the ongoing plans for the publication of DSM-IV serve as a reminder of the DSM-III's commitment to review diagnostic criteria for "consistency, clarity, and conceptual accuracy" (DSM-III-R p. xvii) and revise when necessary.

In the revision process of DSM, the greatest weight was given to the presence of empirical data from well-conducted research studies. However, for most of the proposed diagnostic classification or criteria changes, data from empirical studies were lacking (Introduction, DSM-III-R, 1987). The lack of the empirical investigation used toward the development and refinement of DSM is puzzling given the far-reaching impact of the manual. The DSM diagnostic criteria and classifications are used for teaching, for choosing assessments, guiding treatment decisions, and for subject selection in research studies. The greater specificity and validity achieved in assigning the criteria, the greater the precision afforded to each of these professional endeavors.

An empirical laboratory-based validity study of the DSM-III symptoms of PTSD may help delineate the complex PTSD symptom picture and offer guidance to future revisions of the PTSD diagnostic criteria. Supplementing the clinical description of PTSD symptoms with cognitive, behavioral and psychophysiological measurement of symptoms would support the construct validity or "conceptual accuracy" of a diagnostic category that is widely applied in psychiatric, medical and legal settings (Saigh, 1989).

To date, validity issues in PTSD have been addressed on a limited basis. Studies of combat-related PTSD have focused more often on convergent and discriminant validity than construct validity (King and King, 1991). Studies that have explored the construct validity of PTSD symptoms (Silver and Iacono, 1984; Van Kampen *et al.*, 1986) have relied primarily on self-report data. However, the use of self-report data in the study of anxiety disorders is problematic because of the discordance often observed across self-report, behavioral and physiological response modalities (Barlow and Wolfe, 1981). Furthermore, using self-report data from Vietnam

veterans who may be seeking disability compensation from the VA, complicates the examination of validity because consensus methods for distinguishing exaggerated reporting from true symptom profiles have not been established (Denny *et al.*, 1987).

An empirical laboratory-based validity study of the DSM-III symptoms of PTSD that operationalizes PTSD symptom features is absent from the literature and needed to assist with future refinement of the diagnostic criteria. The DSM-III-R revisions of the PTSD criteria demonstrate that symptom features based initially on clinical observations are not definitive and are subject to this diagnostic evolutionary process.

The purpose of the present study was to investigate the validity of six of the PTSD criteria using an experimental paradigm that incorporated behavioral, cognitive/self-report and psychophysiological measures. The six PTSD criteria tested in this study were selected to include at least one symptom from each of the DSM-III PTSD symptom categories and one associated feature, i.e., anxiety. Once operationalized, these criteria were evaluated for their capacity to distinguish treatment seeking combat veterans with PTSD from combat veterans who were well-adjusted. If empirically based distinctions could be obtained with these operationalized criteria, then the data would provide support for the validity of the PTSD diagnosis.

METHOD

Subjects

Thirty-two male Vietnam combat veterans participated as volunteers in the study. The 16 veterans in the PTSD group (10 white, 6 black) were recruited from the Jackson, Mississippi VA Medical Center's Vietnam Stress Management Program. All had been evaluated for PTSD, but none had been treated in the program at the time of the study. The 16 veterans in the non-PTSD comparison group (11 white, 5 black) were all Vietnam combat veterans recruited from VA Medical Center employees and the Mississippi Army Reserve. None of the non-PTSD subjects were seeking treatment at the time of the study. During recruitment, veterans were told only that a study was being conducted to examine the specific nature of PTSD symptoms.

Subject Selection Criteria

PTSD subjects were included for participation based on their responses to (a) a comprehensive structured interview developed specifically for the assessment of PTSD (Jackson PTSD Structured Interview; Keane

et al., 1985); and (b) an MMPI-PTSD subscale validated on PTSD veterans (Fairbank *et al.*, 1983; Keane *et al.*, 1984). A laboratory-based psychophysiological assessment procedure that has effectively discriminated PTSD veterans from non-PTSD veterans (Malloy *et al.*, 1983) was used to confirm the interview and psychometric-based PTSD diagnosis. All 16 PTSD subjects showed increased physiological arousal in response to the laboratory stimuli. No subjects were excluded based on their response to this procedure.

The structured interview consisted of therapist assessment of the DSM-III diagnostic criteria for PTSD. The DSM-III criteria were followed in assigning the PTSD diagnosis. The structured PTSD interview also included an evaluation of the veteran's premilitary, military, employment, medical, legal, and substance abuse histories. Level of combat exposure was assessed by the Combat Exposure Scale (CES) (Keane *et al.*, 1989). In addition, a mental status examination was conducted on each veteran. Subjects who endorsed symptoms of psychosis, seizure disorder, or a stress disorder due to a nonmilitary trauma were excluded from the study.

Two doctoral level staff members in the PTSD program independently evaluated diagnostic data of patients referred to the Vietnam Stress Management Program. If the structured interview and the MMPI-PTSD subscale (PTSD cut-off 30 and above) were both indicative of PTSD then veterans were assigned to this group. Subjects in the comparison group were interviewed conjointly by two doctoral level clinicians using a PTSD checklist, a clinical interview and MMPI-PTSD subscale scores. These clinicians agreed in all cases that none of the subjects in the comparison group provided sufficient evidence for a PTSD diagnosis or any other DSM-III affective or schizophrenic disorder.

The MMPI-PTSD subscale showed the distinct difference between veteran groups in reported PTSD symptomatology. PTSD subjects had a mean score of 35.5 on this scale while the comparison group subjects had a mean score of 4.0. A t-test of independent samples showed these subscales scores to be significantly different ($t(15) = 11.29, p < .001$). Furthermore, all PTSD subjects responded to the psychophysiological assessment in the expected direction, with increases in heart rate and decreases in skin resistance.

Experimental Design

The present study employed a 2(Group) × 2(Experimental condition) mixed factorial design (Keppel, 1973). PTSD and non-PTSD groups were exposed to four, 30-sec audiotape presentations in both the control and combat conditions. Following each 30-sec sound play a single task was

Table I. PTSD Symptoms and Experimental Tasks

Symptoms	Measures
1. Intrusive thoughts	Intrusive thoughts questionnaire
2. Intensification of symptoms with exposure to traumatic event stimuli	Cognitive and physiological response to control vs. combat stimuli
3. Emotional numbing	Affect recognition task
4. Concentration impairment	Sustained attention task
5. Memory impairment	Short term verbal memory task
6. Anxiety/arousal	Motor steadiness task

presented to the veteran. Thus, the procedural order of (1) audiotape exposure, (2) single task administration, and (3) recovery period was repeated four times within each experimental condition. The four tasks represented four different PTSD symptoms.

The control condition stimuli consisted of percussion, piano, and flute music (Fresh Aire, American Gramaphone Records, Inc., 1981). The combat condition was comprised of authentic combat sounds of grenade launchers, automatic rifle and machine gun fire recorded from the television documentary *Frontline*. Stimuli were presented to subjects through earphones attached to an audiotape cassette recorder. During each experimental session, the stimuli were presented in a standard order with the control condition always preceding the combat condition.

Experimental Tasks and Measures

The four tasks used to measure PTSD symptoms are presented in Table I. Tasks 3, 4, 5, and 6 were presented twice; first in the control condition and second in the combat condition. Subjective units of distress ratings (SUDS) and psychophysiological responses (heart rate) were obtained during the four stimulus presentations in each condition (Measure 2). Finally, the intrusive thoughts questionnaire (Measure 1) was administered following presentation of all four tasks in both the control and combat condition.

Presentation order of the tasks was counterbalanced for each subject within condition (combat or control) and subjects received the same task order in both conditions. Administration time for each of the four tasks ranged from 1 to 2 min. Following task completion, subjects were given a

2-min intertask interval designed to minimize fatigue or anxiety that may have resulted from prior task performance.

The tasks used to test the PTSD symptoms were adapted from the experimental literature. A task was chosen to measure a particular PTSD symptom if it was commonly used as a measure of the construct in the literature.

A. Intrusive Thoughts

An intrusive thoughts questionnaire was adapted from Horowitz (1976) and modified for use in this study. The six-item questionnaire yielded Likert ratings on a 1–7 scale of type, frequency, and intrusiveness of thoughts that occurred following exposure to the control and combat stimuli.

B. Intensification of Symptoms Following Exposure to Trauma-Related Stimuli

Two modes of anxiety manifestation (psychophysiological and self-report) were measured to assess subjects' reaction to the experimental stimuli. The subjects' responses to the control versus combat stimuli served as a test of the symptom "intensification of symptoms with exposure to stimuli that represent the trauma."

It is important to note the difference between the two sets of stimuli used in the study to evaluate psychophysiological responding. The first stimulus was used as an assessment tool to confirm diagnostic classification (i.e., psychophysiological assessment, Malloy *et al.*, 1983). The second stimulus was used as an experimental variable in the study to test the PTSD symptom "intensification of symptoms with exposure to traumatic stimuli". The two sets of stimuli were independent from one another. The diagnostic assessment stimuli were control and combat videotapes, consisting of still photographs with corresponding audio. The experimental stimuli were audiotapes of different content, obtained from a different source.

During each of the four, 30-sec audiotape presentations in both control and combat conditions, the subject's psychophysiological responses (heart rate), were measured using a Grass Model 7 Polygraph located in a control room adjacent to the experimental room. Heart rate was scored in beats per minute for the final 30 sec of each baseline period, each 30-sec stimulus presentation period and each 30-sec post-task interval.

Self-report ratings of anxiety were also obtained from subjects immediately following each 30-sec stimulus presentation. Ratings were made on

an 11-point anxiety thermometer (0 = "not anxious", 10 = "the most anxious I have ever felt"). Repeated measures ANOVA were conducted by condition for the subject's mean anxiety rating.

C. Emotional Numbing

Affect recognition was tested using auditory stimuli with four sentences of neutral content (cf. Tucker *et al.*, 1977). Each sentence was presented once on audiotape with one of four affective intonations: disgusted, sad, angry, or indifferent. Subjects were instructed to focus on the emotional tone of the model and not the content of the sentence. Following presentation of each sentence, the subject was required to judge the affect of the model by choosing an emotion using a multiple choice format (e.g., disgusted, sad, angry, indifferent).

Prior to the experiment a group of ten independent raters (VA Medical Center staff members) validated the affective intonation of these audio stimuli. The validation raters correctly identified the affective tone in 87.5% (average) of the stimulus items.

D. Concentration Impairment

The sustained attention task consisted of an audiotape of 75 letters serially presented at a rate of one letter per second (Lezak, 1983). Nine different letters (ABCDEFGHI) were randomly repeated in the stimulus sequence. Two different letter sets were used, one for each stimulus condition. The subject was required to press a button each time he heard one of the target letters (C or E) on the tape. In each condition, data were scored as the number of target letters not identified (omission errors) and number of nontargeted letters to which the subject responded (commission errors).

E. Memory Impairment

Memory testing consisted of immediate recall of a brief story of paragraph length. Two paragraphs, paragraph B from the Logical Memory Test of the Wechsler Memory (Wechsler, 1945) and a paragraph from Barbizet and Cany's (1968) memory battery were used. Two paragraphs were selected because they contain 22 memory units of ideas each. This allowed greater standardization for use in the two experimental conditions. Data were recorded in terms of the number of memory units recalled and the

percent verbatim recall in each condition. Presentation of the paragraphs was balanced so that one half of the subjects received the Wechsler paragraph under the control condition and the remaining subjects received the Barbizet and Cany paragraph under the control condition.

F. Arousal and Anxiety

A motor steadiness task offered one measure of the behavioral effects of experimentally-induced autonomic arousal. Procedurally, the subject's task was to hold a metal stylus in each of three holes for 15 sec without touching the side. The test hole diameters were 0.156, 0.125, and 0.109 in. and the stylus diameter was 0.0625 in. The Steadiness Tester (Lafayette Model No. 32011) and stylus were connected to a timer and counter that recorded the total number of times the subject touched the side of the three holes.

Experimental Procedure

Subjects were seated behind a small table in a well-lit inner room (3 × 3 m). Heart rate was monitored with electrodes attached to the left arm and both legs. A 5-min baseline recording period was followed by standardized procedural instructions. The experiment was initiated with presentation of the 30-sec control stimulus through headphones. At the end of the stimulus tape the subject rated his anxiety on the 11-point scale. The experimenter then presented the first task, followed by the 2-min intertask interval. After all four tasks were presented in this fashion, the intrusive thoughts questionnaire was administered.

The above procedure was repeated with the combat-stimulus soundtrack after another 5-min baseline period, and review of the instructions. At the conclusion of the testing session, the subject was fully debriefed about the purpose of the study.

RESULTS

Subjects did not differ on any demographic variable that would directly affect performance on the cognitive and behavioral tasks, e.g., age (PTSD M = 34.5, SD = 2.9; WA M = 36.8, SD = 4.3) or education (PTSD M = 12.9, SD = 3.0; WA M = 13.4, SD = 2.9). Vietnam veterans with PTSD reported a significantly greater exposure to combat (heavy, moderate, light: PTSD N = 8, 7, 1; WA N = 3, 7, 6), were significantly younger during their Vietnam service (PTSD M = 19.8 years, SD = 1.9; WA M = 22.7 years, SD = 3.7) and had a higher divorce rate than the non-PTSD veterans in this study.

Various analytic strategies were considered for handling the different combat exposure level between groups. We chose an analysis of variance (ANOVA) rather than analysis of covariance (ANCOVA) primarily due to the strong correlation between combat exposure and the independent variable under study, PTSD. Epidemiological research shows that combat exposure level and PTSD are inextricably linked (Kulka *et al.*, 1988b). Analysis of covariance would have adjusted the mean scores to represent a situation in which both PTSD and non-PTSD subjects had the same combat exposure level. This situation is clinically unrealistic, therefore, we felt that adjusted values from an ANCOVA would be meaningless (cf. Tabachnick and Fidell, 1983).

Task performance data were analyzed using repeated measures analysis of variance with a 2 × 2 (Group × Condition) design. Table II presents the means and standard deviations for the PTSD and well-adjusted groups on five of the experimental measures. The small number of subjects in each group and the preliminary nature of this study precluded the use of multivariate analyses.

Intrusive Thoughts

All subjects reported low levels of intrusive cognition during the control condition. However, during the combat condition, the PTSD veterans reported high levels of intrusive cognition, while the well-adjusted group ratings on this dimension remained the same (see Table II). This finding is supported by a significant Group × Condition interaction, $F(1, 30) = 26.35, p < .0001$.

The subjects' descriptive ratings of their thoughts during the experiment show the distressing nature of the PTSD veterans' cognitive response to the combat stimuli. In the control condition, both groups rated their thoughts as being pleasant. In contrast, during the combat condition, the PTSD subjects rated their thoughts as significantly more violent ($F(1, 30) = 15.52, p < .001$) and frightening ($F(1, 30) = 16.74, p < .001$) than did the well-adjusted subjects.

Intensification of Symptoms with Exposure to Trauma-Stimuli

A 2 (Group) × 2 (Condition), split-plot ANOVA (Keppel, 1973) was employed to analyze the experimental effects for heart rate and subjective ratings of anxiety (SUDS).

Figure 1 presents the group mean heart rate (HR) across experimental conditions. The heart rate (beats per minute) for both groups was equivalent during the control condition baseline and throughout the control

stimulus condition. With the introduction of the combat stimuli, the heart rate of the PTSD group increased, while the well-adjusted veterans' mean heart rate dropped from the original baseline. The two groups had a mean difference of 6.1 beats per minute in the combat condition demonstrating greater responsivity for the PTSD group as a function of the combat stimuli ($F(7, 210) = 3.83, p < .001$).

Table II shows the subject's anxiety (SUDS ratings) during the experimental audiotapes. Both the PTSD and well-adjusted veterans rated their anxiety on the fear thermometer at low levels following the control stimulus tape. During the combat condition, both groups reported an increase in anxiety, yet the PTSD veterans reported significantly higher levels of anxiety than the well-adjusted veterans resulting in a significant Group × Condition interaction $F(7, 210) = 15.77, p < .0001$.

Emotional Numbing

Data from this task were analyzed qualitatively for pattern of correct responses. Chi-square analyses of the percentage of correct affective stimuli responses demonstrated a different pattern between the two groups. A significantly greater percentage of the well-adjusted veterans correctly identified the "sad" stimulus in both the control and combat condition than did the PTSD veterans (Control Condition: PTSD = 14.3% correct identification; WA = 37.5% correct identification; Combat Condition: PTSD = 42.9% correct; WA = 68.8% correct).

Well-adjusted subjects were also more likely to identify correctly the "matter-of-fact" affective stimulus than the PTSD subjects. This difference reached statistical significance in the control condition but not in the combat condition, PTSD (69.2%) vs. WA (100%), $X^2_{df=1} = 36.7$, $p < .01$.

In contrast, the PTSD veterans were more likely to correctly identify the anger stimulus than the well-adjusted subjects. This was true in both the control condition, PTSD (53.8%) vs. WA (25%), $X^2_{df=1} = 17.6$, $p < .01$ and combat condition. Finally, no difference was seen between groups on the "disgusted" affective stimulus. Thus, although some differences emerged between groups on this task (e.g., the PTSD veterans are more sensitive to anger stimuli and less sensitive to sad stimuli than the well-adjusted veterans) the results did not follow a consistent pattern across experimental conditions or type of affective stimulus. The skill of affect recognition and its relationship to the symptom "constricted affect" is undoubtedly complex and these results can only be considered preliminary.

Table II. Mean Task Performance Scores by Diagnostic Group and Condition[a]

Measure	PTSD				Well-Adjusted				$F(1, 30)$ Group × condition
	Control		Combat		Control		Combat		
	M	SD	M	SD	M	SD	M	SD	
Thought Intrusion Ratings	3.1	1.5	5.9	1.1	3.6	1.6	3.3	1.6	26.35***
Thought Content Ratings									
Pleasant	4.9	1.4	1.8	.8	4.6	1.3	3.2	1.5	14.04**
Violent	1.7	1.3	5.6	1.6	1.2	.4	2.8	1.5	15.52**
Frightening	1.8	1.2	5.2	1.8	1.4	.8	2.4	1.3	16.74**
SUDS Ratings	.66	1.2	6.0	2.7	.64	1.3	2.3	1.6	15.77***
Sustained Attention									
Omission Errors	3.1	3.6	3.9	4.3	1.0	1.0	1.2	1.4	.33
Commission Errors	0.4	0.8	0.7	1.5	.5	.8	0.1	0.3	1.45
Immediate Verbal Memory									
Unit Recall (#)	9.7	3.6	11.0	4.4	9.9	3.9	11.7	3.8	.06
Percent Verbatim Recall	27.7	13.2	29.2	12.2	26.6	11.3	34.4	12.2	1.59
Motor Steadiness Errors	27.6	18.6	33.2	22.9	24.7	12.6	20.7	9.9	7.22*

[a] Note: * = $p < .01$; ** = $p < .001$; *** = $p < .0001$.

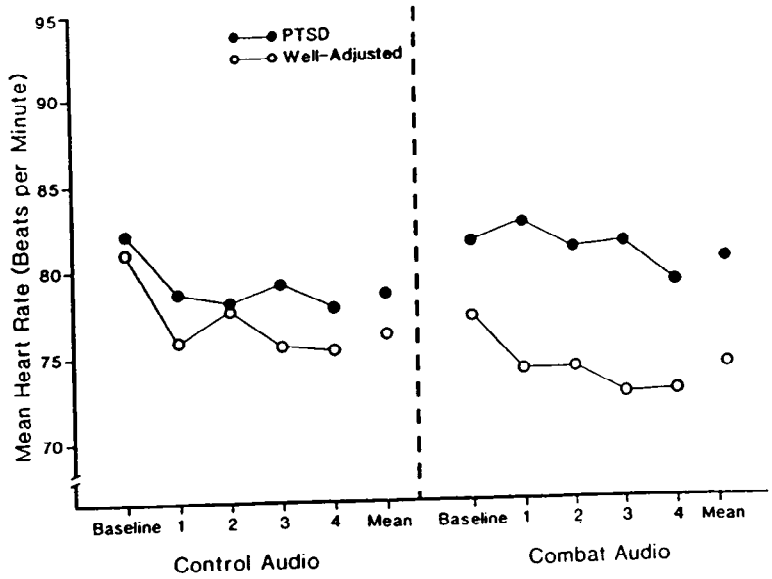

Fig. 1. Mean heart rate of PTSD and well-adjusted groups during control and combat audio presentations.

Concentration Impairment

Following both the control and combat audiotapes the PTSD subjects made significantly more omission errors than did the comparison group on the sustained attention task (see Table II). Well-adjusted subjects missed an average of one of the 76 target letters in both stimulus conditions while the PTSD subjects missed an average of more than three target letters in the control condition and combat condition. This finding is supported by the significant main effect for Group $F(1, 30) = 16.34$, $p < .001$. Errors of commission did not differentiate the two.

Memory Impairment

Both groups showed approximately equal recall of a paragraph during the control condition, as well as during the combat condition. This finding was consistent for both the number of memory units and percent verbatim recall analyses (see Table II).

Anxiety/Arousal

Table II shows the mean number of errors on the motor steadiness task. During the control condition both groups performed with a comparable number of errors. Following the combat stimuli, the PTSD veterans became increasingly unsteady while the well-adjusted veterans improved their motor steadiness during the same period. A significant Group × Condition interaction supports this interpretation, $F(1, 30) = 7.22, p < .01$.

DISCUSSION

Five of the six measures used in this study were effective in differentiating the two combat veteran groups. These differences provide supporting evidence for the validity of several of the PTSD criteria contained in the DSM-III. First and foremost, the symptom of re-experiencing the trauma, as measured by self-report of intrusive thoughts, occurred only in the PTSD group. The PTSD veterans' reports of increased anxiety, thought intrusion and generally frightening and violent cognitions during the combat condition provided empirical evidence for the cardinal symptom of the disorder.

We also found support for the four other PTSD symptoms: (1) intensification of symptoms by exposure to events that resemble the traumatic event, (2) concentration difficulties, (3) anxiety/arousal, and 4) emotional numbing. Short term memory, as tested here, did not differentiate PTSD subjects from their well-adjusted controls; thus, validating evidence was not obtained for this symptom.

In addition to offering support for the validity of the diagnosis of PTSD, the present results support the revisions found in the DSM-III-R. Diagnostic categories including re-experiencing the trauma (e.g., intrusive thoughts), and persistent aversive arousal is consistent with our findings of the central features of PTSD.

This study design also allowed us to examine the tonic and phasic nature of PTSD. The phasic aspect was represented by the shift in performance on the laboratory-based tasks only after the PTSD veterans were exposed to the combat audiotape (cf. significant Combat × Condition interactions for these variables, Table II). These findings are consistent with the increase in symptomatology described in DSM-III-R following exposure to events that symbolize the traumatic event.

However, one of the criteria tested, "difficulty concentrating" (represented by the sustained attention task) did not reflect a similar phasic response pattern (cf. the main effect of group). The PTSD veterans exhibited

a concentration deficit in both the control and combat conditions. Thus, the difficulty concentrating criterion appears to be more constant and is not evoked exclusively by trauma-relevant stimuli.

In the present study, laboratory findings provided construct validity for the clinical observations and descriptions employed in the DSM-III classification system. However, these results have several limitations. First, each task chosen to represent a PTSD symptom describes a highly specific behavior thus limiting its generalizability. For example, we found that the PTSD veteran group performed more poorly than the well-adjusted group on an auditory concentration task. However, concentration abilities for visual stimuli were not tested. Thus, our results are confined to a specific and single modality of the complex phenomenon of concentration. Perhaps specificity of the laboratory task is more significant when no differences were found between groups (e.g., in the short-term memory task). The two veteran groups performed equally well on recall of the specific paragraphs used in the study. However, neither intermediate memory, long-term verbal memory, nor visual memory were tested in the present study. It would be important to fully test the parameters of each criterion symptom in future research.

Furthermore, while some PTSD symptoms were readily operationalized as laboratory tests (e.g., concentration impairment tested by an auditory sustained attention task) the less specific and more complex PTSD symptom (e.g., "numbing; feeling of detachment from others") was more difficult to operationalize and test in the lab. This is exemplified by the nondefinitive results from the affect recognition task. Although the PTSD group was significantly different from the comparison group on four of eight labeling tasks, the direction of this difference was not consistent. Future operationalization of this symptom should include a wider array of affective stimuli which may further discriminate subject groups. Alternatively, a behavioral role playing task may provide a more direct measure of emotional detachment.

Finally, two subject selection factors in this study limit both the generalizability and meaningfulness of our results. As described earlier, diagnostic assignment to subject group was confirmed by psychophysiological response to a combat assessment measure. Since all PTSD subjects showed increased psychophysiological response to this task, their reaction to the measures of this study also may be affected by this responsiveness. That is, the PTSD subjects in this study may represent a subset of PTSD patients who are "physiological responders". Future studies should include both responders and non-responders on this dimension. Secondly, PTSD subjects with comorbid psychiatric disorders (e.g., substance abuse, depression or personality disorders) were not systematically assessed or excluded

from this study. Thus, the PTSD subjects represent a mixed psychopathological group and some of the experimental deficits noted may be influenced by other psychiatric conditions or symptoms. Follow-up studies including both non-combat PTSD and non-PTSD psychiatric comparison groups, utilizing both combat and non-combat stress stimuli, may increase the precision of these findings.

In conclusion, the validity and utility of the DSM-III diagnostic criteria for mental disorders have been viewed as "no more than a promise and an aspiration" (Millon, 1983). Studies such as the present one are necessary to transform these hopes into an empirically based diagnostic classification system. Further experimentation is necessary before the specific symptoms of combat-related PTSD and their situational parameters can be fully known. Nonetheless, the present study provides preliminary scientific evidence to support the DSM-III and DSM-III-R criteria as well as the view that PTSD Vietnam veterans are different from their well-adjusted counterparts in motoric, cognitive and psychophysiological aspects of behavior.

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