Psychological Assessment:
A Journal of Consulting and Clinical Psychology
1989, Vol. 1, No. 1, 53-55

BRIEF REPORTS

Clinical Evaluation of a Measure to Assess Combat Exposure

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The Combat Exposure Scale (CES) was constructed as an attempt to measure the subjective report of wartime stressors experienced by combatants. This sequence of three studies demonstrates that the CES possesses sound psychometric properties. These include internal stability and test-retest reliability. As predicted from other studies on this topic, those veterans with a diagnosis of posttraumatic stress disorder reported higher amounts of combat exposure. The limitations of a purely retrospective measure of combat stressors are discussed.

The role of combat exposure is assumed to be central in the development of posttraumatic stress disorder (PTSD; Egendorf, Kadushin, Laufer, Rothbart, & Sloan, 1981; Foy, Sipprelle, Rueger, & Carroll, 1984). Recently, a few psychometric scales have been developed to measure combat exposure in an effort to quantify this construct for research and clinical purposes (Egendorf et al., 1981; Friedman, Schneiderman, West, & Corsen, 1986; Lund, Foy, Sipprelle, & Strachan, 1984). Unfortunately, few scales have psychometric properties that recommend their use for research purposes. To be suitable for research a combat exposure scale must be easily administered, be easily scored, possess sound psychometric properties (i.e., internal stability, test-retest reliability), and have some degree of external validity. The purpose of the present study was to develop a self-report scale to measure combat exposure that would meet these criteria for use in clinical research.

Three of the seven items on our Likert-type Combat Exposure Scale were derived from Figley's (1980) combat scale, and the remaining items were generated by consensus by four clinical psychologists, all of whom were highly experienced in the assessment and treatment of combat-related PTSD. Items on the newly developed scale were weighted differentially according to the severity of the experience (i.e., "seeing someone hit by incoming enemy rounds" is weighted more than "firing rounds at the enemy"). Total scores ranged from 0 to 41.

The psychometric properties of the scale were assessed in three separate studies involving distinct patient samples: (a) an investigation of its internal consistency and its factor structure, (b) an assessment of its test-retest reliability, and (c) a comparison of scores of combat veterans who did and did not reach *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-III;* American Psychiatric Association, 1980) criteria for PTSD.

Psychometric Analysis

Method

Subjects included 362 male, Vietnam-era veterans who were seeking therapy and/or various other services from six Vet Centers across the country. Their mean age was 37.7 years (SD = 4.0), and their mean number of years of education was 13.26 (SD = 2.3); 57% were married and 52% were White. Veterans were asked to complete the Combat Exposure Scale in conjunction with a demographic questionnaire and the Mississippi Scale for Combat Related PTSD (Keane, Caddell, & Taylor, 1988; Kulka, Schlenger, & Chromy, 1983).

Results

Internal consistency. The mean score on the Combat Exposure Scale was 25.57 (SD = 10.12); scores ranged from 1 to 41. Coefficient alpha was calculated and yielded a value of .85. This high degree of reliability indicates that the items are measuring the same or a very similar construct. As a second measure of internal consistency, we computed item-remainder total score

Preparation of this article was supported by a Veterans Administration Merit Review Award to Terence M. Keane.

This article is based on a paper presented at the Annual Convention of the American Psychological Association, New York City, August 1987.

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Table 1
Factor Loadings of Principal-Components Analysis for the Combat Exposure Scale

Scale item	Factor 1
1. Did you ever go on combat patrols or have other dangerous duty?	.73
2. Were you ever under enemy fire?	.74
3. Were you ever surrounded by the enemy?	.71
4. What percent of the men in your unit were killed, wounded, or missing in action?	.69
5. How often did you fire rounds at the enemy?	.82
6. How often did you see someone get hit by incoming or outgoing rounds?	.82
7. How often were you in danger of being injured or killed in the line of duty?	.79

correlations. The average correlation was .75 (range = .64 to .83).

Principal-components analysis. A principal-components analysis using varimax rotation generated a single factor with an eigenvalue greater than 1.0. The item loadings are contained in Table 1 and accounted for 57.6% of the common variance among the items. Because a single factor accounted for a high percentage of the variance, the scale seems to measure a single, consistent construct of combat exposure.

Test–Retest Reliability

Method

To assess the test–retest reliability of the scale, we recruited a heterogeneous group of 39 Vietnam-theater veterans. Subjects completed the scale twice, with a 1-week intertest interval. Subjects were non-help-seeking Vietnam combat veterans currently employed by the Boston Veterans Administration Medical Center (n = 19), Vietnam combat veterans seeking outpatient treatment at the Boston Vet Center (n = 9), and Vietnam combat veterans receiving inpatient substance abuse treatment there (n = 11). The mean age and years of education across the three groups combined were 38.77 (SD = 4.45) and 13.64 (SD = 2.13), respectively.

Results

Reliability. Test–retest reliability with a 1-week interval was calculated for all three groups combined, $r(29) = .97$, $p < .0001$. There were no between-group differences in the test–retest correlations. The means for Time 1 and Time 2 were 23.2 and 22.2, respectively, indicating excellent stability over this time period.

Comparison of PTSD and Non-PTSD Samples

Method

Subjects were 30 Vietnam combat veterans who received a PTSD diagnosis by consensus of an assessment team following a comprehensive multiaxial assessment described in detail elsewhere (Keane, Fairbank, Caddell, Zimering, & Bender, 1985; Keane, Wolfe, & Taylor, 1987; Wolfe, Keane, Lyons, & Gerardi, 1987) and 32 members of the Vietnam Veterans Leadership Group (VVL), a national organization whose members represent those Vietnam veterans who are successful contributors to their communities. The VVL subjects responded to a request for combat veterans who were without a psychiatric history. All subjects completed the Combat Exposure Scale (CES), the Mississippi Scale for Combat Related PTSD, and a demographic questionnaire. The mean age and years of education for the PTSD group were 36.9 (SD = 2.5) and 13.27 (SD = 2.1); those for the VVL group were 39.3 (SD = 6.4) and 16.34 (SD = 2.8). The VVL group was significantly more educated than the PTSD group, $t(59) = 4.80$, $p < .0001$.

Results

Descriptive statistics. The mean scores on the CES were 29.37 (SD = 6.12) for the PTSD group and 22.84 (SD = 10.42) for the VVL group, a difference that attained statistical significance, $t(60) = 2.98$, $p < .005$. As predicted, the PTSD group reported greater amounts of combat exposure than did the VVL group. This may be attributed to either actual differences in amount of combat exposure or differences in subjective recall of combat experience by clinically distressed individuals. Scores on the CES were significantly correlated with scores on the Mississippi Scale for the VVL group, $r(30) = .43$, $p < .01$; however, the corresponding correlation for the PTSD group did not reach statistical significance. The absence of a significant correlation for the PTSD group is likely due to the truncated range of scores for these subjects on the CES and the Mississippi Scale. Neither age nor educational level correlated with scores on the CES.

General Discussion

Evidence from the three studies presented here confirms that the CES merits consideration for further use by clinicians and researchers. With improved quantification of the stressor (in this case, combat), we can begin to understand the importance of its interactive relationship with the characteristics of the individual and the posttrauma environment in subsequent manifestations of psychopathology. Future findings that relate dimensions of the stressor to subsequent adjustment will further elucidate this relationship.

In this study we approached the measurement of combat exposure using a subjective scale that attempts to quantify an experience through retrospective review. Although we clearly recognize the limitations inherent in the retrospective and self-report nature of this assessment, alternatives to the problem are both expensive and difficult logistically. Moreover, the individual's perspective in the measurement of stress exposure may ultimately prove to be a crucial variable accounting for differences in adjustment. However, it must be emphasized that current levels of adjustment may influence retrospective ratings of combat stressors. Future studies examining the relationship of the CES with objective measures of combat exposure (e.g., assigned military duties, number of men killed or wounded in one's unit, awards for bravery) would be welcome.

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Received March 11, 1988
Revision received June 23, 1988
Accepted July 19, 1988 ■