

The Peritraumatic Distress Inventory: A Proposed Measure of PTSD Criterion A2

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Objective: Meeting criterion A2 for the diagnosis of posttraumatic stress disorder (PTSD) in DSM-IV requires that an individual have high levels of distress during or after the traumatic event. Because of the paucity of valid and reliable instruments for assessing such responses, the authors developed a 13-item self-report measure, the Peritraumatic Distress Inventory, to obtain a quantitative measure of the level of distress experienced during and immediately after a traumatic event.

Method: The cross-sectional study group comprised 702 police officers and 301 matched nonpolice comparison subjects varying in ethnicity and gender who were exposed to a wide range of critical incidents.

Results: The Peritraumatic Distress Inventory was found to be internally consistent, with good test-retest reliability and good convergent and divergent validity. Even after controlling for peritraumatic dissociation and for general psychopathology, the authors found that Peritraumatic Distress Inventory scores correlated with two measures of posttraumatic stress symptoms.

Conclusions: The Peritraumatic Distress Inventory holds promise as a measure of PTSD criterion A2. Future studies should prospectively examine the ability of the Peritraumatic Distress Inventory to predict PTSD and its associated biological and cognitive correlates in other trauma-exposed groups.

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The diagnostic criteria for posttraumatic stress disorder (PTSD) in DSM-III specified that events were traumatic if they were outside the realm of usual human experience *and* would evoke significant distress in the vast majority of people. The finding that a traumatic event will occur at some time in the lives of more than half of the adults in the United States (1) necessitated revision of this specification. In DSM-IV the exposure criterion was modified into two components. Criterion A1 specifies that the event must represent a serious threat to the self or to others; criterion A2 requires that the initial response to the event involve fear, helplessness, or horror. This change fundamentally reconceptualized trauma exposure, explicitly acknowledging the wide individual differences in immediate response.

There are several reasons to study responses occurring at the time of a trauma and immediately after, a time frame that has come to be called “peritraumatic” (2). Self-reported peritraumatic responses might explain additional variability in PTSD symptoms over and above the objective trauma characteristic, a view supported by a meta-analysis (3) that found peritraumatic dissociation to be a better predictor of PTSD than objective trauma characteristics. Given that acute dissociative responses occur in the context of elevated distress (4) and that not everyone who experiences high levels of distress during trauma has a dissociative response, peritraumatic distress may have predictive value over and above peritraumatic dissociation. Indeed, it has been proposed that peritraumatic

anxious arousal enhances trauma-related memory (5) and sensitizes the neurobiological systems implicated in the pathogenesis of PTSD (6). This hypothesis cannot be fully investigated without valid and reliable instruments for assessing peritraumatic emotional distress.

With the intent of creating an inventory of immediate responses to trauma, we reviewed the literature and found studies reporting heightened emotional distress and bodily arousal as concomitants of trauma exposure. Examples included feelings of personal life threat (7), fear (8, 9), feelings of helplessness (9, 10), horror (9), guilt and shame (9, 11), anger (9, 12), loss of bowel and bladder control (11, 13), and shaking, trembling, and increased heart rate (8, 14–16).

In this article we present the psychometric properties of the Peritraumatic Distress Inventory as developed in a study group of police officers; we also examine both reliability and validity of the instrument. We show that peritraumatic distress scores are positively associated with two measures of PTSD symptoms, even after partialling out variance accounted for by general psychopathology or by peritraumatic dissociation. Finally, we extend those results to a study group of civilians.

Method

Participants and Procedure

Police officers (N=747) were recruited from the police departments of New York City and Oakland and San Jose, Calif., in a study whose goal was to examine levels of PTSD symptoms as

TABLE 1. Characteristics of Police Officers and Comparison Subjects Who Completed the Peritraumatic Distress Inventory

Characteristic	Police Officers (N=702)		Comparison Subjects (N=301)		Analysis		
	N	%	N	%	χ^2	df	r_s
Gender					39.87**	1	0.20
Male	551	78.5	179	59.5			
Female	145	20.7	120	39.9			
Undisclosed	6	0.9	2	0.7			
Education					41.35**	2	0.20
Up to high school diploma	226	32.2	94	31.2			
Associate or bachelor's degree	452	64.4	168	55.8			
Graduate school	24	3.4	39	13.0			
Household income					96.98**	3	-0.21
Up to \$50,000	82	11.7	113	37.5			
\$50,001-\$70,000	256	36.5	76	25.2			
\$70,001-\$90,000	173	24.6	43	14.3			
≥\$90,001	191	27.2	69	22.9			
Marital status					9.20*	5	0.06
Married	422	60.1	157	52.2			
Living together	55	7.8	25	8.3			
Steady relationship	48	6.8	20	6.6			
Divorced	69	9.8	29	9.6			
Widowed	3	0.4	0	0.0			
Single	97	13.8	70	23.3			
Undisclosed	8	1.1	0	0.0			
Ethnicity					47.25**	3	-0.18
Caucasian	312	44.4	198	65.8			
African American	154	21.9	37	12.3			
Hispanic	175	24.9	35	11.6			
Other/multiple	51	7.3	24	8.0			
Undisclosed	10	1.4	7	2.3			

* $p < 0.05$. ** $p < 0.001$.

well as risk and resilience factors for PTSD. Potential participants were selected from departmental personnel rosters with a proportionally higher pool of minority and female officers. In all other respects selection was random. To assemble a comparison group, we asked the officers to nominate nonpolice peers who were matched in age and gender. These men and women were then asked to participate. The groups are best described as convenience study groups.

The mean age of the 702 police officers who reported a valid critical incident as their index event (explained in the section on critical incident exposure) was 36.98 years ($SD=6.79$, range=21–62); the mean age of the 301 comparison subjects who reported a valid critical incident was 36.68 ($SD=8.15$, range=20–69) ($t=0.60$, $df=1,001$, $p>0.05$). Table 1 presents the other demographic characteristics of these police officers and comparison subjects; the groups differed on a number of variables.

After the procedure was fully explained, written consent was obtained from all participants. Subjects were given a self-report questionnaire, a return envelope, and an offer of \$100 reimbursement.

Instruments

Peritraumatic Distress Inventory. The instruction for the Peritraumatic Distress Inventory is to rate the extent to which each item was experienced “during the critical incident you selected and immediately after.” The response format is a Likert scale that ranges from 0 to 4 (0=not at all, 1=slightly, 2=somewhat, 3=very, and 4=extremely true). The Peritraumatic Distress Inventory items are provided in Table 2. The total score is obtained by determining the mean response across all 13 items.

Critical incident exposure. To assess critical incident exposure, we used the Critical Incident History Questionnaire (17) for police officers and the Trauma History Questionnaire (18) for comparison subjects. After completing these measures, participants were asked to select one event that had up to the present been “the most troublesome, disturbing, or distressing.” This index event was used for completing other incident-specific questionnaires.

Index events were classified by a research assistant using a coding scheme derived in part from the Evaluation of Lifetime Stressors Questionnaire and Interview (19). Severity of critical incident exposure was classified into one of four categories: experiencing, witnessing, hearing of a significant other having experienced a critical incident, or absence of a critical incident involving a threat to the physical integrity of self or other. Event type was classified in one of the following categories: accident, natural disaster, physical assault, sexual assault, illness/injury or death, combat, harassment/threats, or other critical incident. Of all the index events, 20% were independently rated by a psychologist with expertise in PTSD; kappas of 0.71 and 0.79 were achieved for event type and severity, indicating substantial interrater agreement between the psychologist and the research assistant.

Trauma-related measures. In relation to the index event, the participants completed three measures: 1) the Peritraumatic Dissociative Experiences Questionnaire (2), which assesses dissociative experiences at the time of a critical incident; 2) the Impact of Event Scale—Revised (20), which measures PTSD symptoms of intrusion, avoidance, and arousal within the last 7 days; and 3) the civilian version of the Mississippi Scale for Combat-Related PTSD (21), which provides a cumulative measure of PTSD and associated symptoms since the occurrence of the index event. Both the Impact of Event Scale—Revised and the Civilian Mississippi Scale provide dimensional assessments of PTSD symptom levels rather than categorical determinations of PTSD diagnosis.

Other measures. The SCL-90-R (22) was used to examine current general psychopathology symptoms. Current level of perceived social support was assessed with the Sources of Support measure (23). The Marlowe-Crowne Scale form C (24) was used to assess social desirability. The 12-item Short-Form Health Survey (25) was used to assess current physical health.

Statistical Analyses

All analyses were two-tailed, with an alpha of 0.05. We controlled for family-wise error rate by using the false discovery rate

TABLE 2. Endorsement of Items on the Peritraumatic Distress Inventory by Police Officers and Comparison Subjects Who Completed Measures Assessing Reactions to Traumatic Events^a

Item Description	Police Officers (N=702)					Comparison Subjects (N=301)				
	Endorsed Item		Score		Correlation Between Item Score and Total Score	Endorsed Item		Score		Correlation Between Item Score and Total Score
	N	%	Mean	SD	r _s	N	%	Mean	SD	r _s
I felt helpless to do more	492	70.1	1.7	1.4	0.50	254	84.4	2.2	1.4	0.40
I felt sadness and grief	529	75.4	2.1	1.5	0.30	266	88.4	2.8	1.4	0.31
I felt frustrated or angry I could not do more	544	77.5	2.1	1.5	0.52	272	90.4	2.7	1.3	0.43
I felt afraid for my safety	366	52.1	1.4	1.6	0.22	156	51.8 ^b	1.4	1.6 ^b	0.36
I felt guilt that more was not done	314	44.7	1.0	1.3	0.47	174	57.8	1.3	1.4	0.38
I felt ashamed of my emotional reactions	174	24.8	0.4	0.9	0.41	123	40.9	0.9	1.3	0.35
I felt worried about the safety of others	437	62.3	1.7	1.5	0.20	137	45.5	1.1	1.5	0.18
I had the feeling I was about to lose control of my emotions	246	35.0	0.7	1.1	0.51	209	69.4	1.6	1.4	0.49
I had difficulty controlling my bowel and bladder	23	3.3	0.1	0.4	0.21	21	7.0	0.1	0.5 ^b	0.22
I was horrified by what happened	430	61.3	1.5	1.5	0.40	183	60.8 ^b	1.6	1.5 ^b	0.45
I had physical reactions like sweating, shaking, and pounding heart	444	63.2	1.5	1.4	0.51	220	73.1	2.0	1.5	0.53
I felt I might pass out	77	11.0	0.2	0.8	0.33	94	31.2	0.7	1.2	0.42
I thought I might die	203	28.9	0.7	1.3	0.27	105	34.9 ^b	0.9	1.5	0.44

^a Scores range from 0 to 4 (not at all true to extremely true). All the between-group individual item statistical comparisons (two-by-two chi-squares for rates and independent t tests for means) were significant at p<0.05 unless specified otherwise.

^b n.s.

procedure for each family of tests (26). Twenty-five percent of the participants had missing data, representing 0.4% of all data points. No significant relationship was found between the patterns of missing data and Peritraumatic Distress Inventory results. Missing values on all interval or ratio scales except the Peritraumatic Distress Inventory and the critical incidents were calculated by using the expectation maximization method (27). An a priori power analysis indicated greater than 80% power to detect correlations of 0.11 in officers and 0.18 in comparison subjects.

Results

Trauma Exposure and Index Events

Exposure severity for the officers' index events was as follows: 322 (45.9%) personally experienced a critical incident, 308 (43.9%) were witness to an incident, and 72 (10.3%) heard of the exposure of a close friend or relative to a critical incident. The incidents included accidents (N=8, 1.1%), natural disasters (N=4, 0.6%), physical assaults (N=157, 22.4%), sexual assaults (N=17, 2.4%), illnesses/injuries or deaths (N=449, 64.0%), harassment/threats (N=44, 6.3%), and other critical incidents (N=16, 2.3%).

Exposure severity for the index event in comparison subjects included personally experiencing a critical incident (N=182, 60.5%), witnessing a critical incident (N=49, 16.3%), and hearing of the exposure of a close friend or relative to a critical incident (N=70, 23.3%). The index events included accidents (N=11, 3.7%), disasters (N=8, 2.7%), physical assaults (N=52, 17.3%), and sexual assaults (N=15, 5.0%), illnesses/injuries or deaths (N=156, 51.8%), combat (N=4, 1.3%), harassment/threats (N=38, 12.6%), and other critical incidents (N=17, 5.6%). Most index events were not of recent origin: the mean time since the incident for officers was 6.64 years (SD=5.16); for the comparison subjects it

was 8.83 years (SD=6.50). The groups did not differ in terms of social desirability (t=0.64, df=1,001, p>0.05).

Peritraumatic Distress Inventory Psychometrics

The Peritraumatic Distress Inventory is derived from an earlier scale, the 23-item Peritraumatic Emotional Distress Scale (28). Items were revised by a panel of six researchers and clinicians working in the field of PTSD (A.B., D.S.W., S.R.B., T.C.N., C.R.M.) and violence (J.F.). Nine items were retained and three were reformulated. Eleven items were dropped on the basis of a consensus that they did not apply to a wide array of critical incidents. Nine new items were added on the basis of a literature review and the clinical experience of the panel members, for a total of 21. In a preliminary report, we examined the factor analytic structure of this pool of 21 items, which yielded three factors (29). Because one of these factors included a method confound and several of its items did not occur strictly within a peritraumatic time frame, that factor was dropped, along with its items.

We performed a new principal factor analysis using the remaining set of 13 items. Squared multiple correlations were used as initial communality estimates. Estimates were iterated. An oblique promax rotation was performed on the factors with an eigenvalue greater than 1. The first factor (negative emotions) had seven items, and the second (perceived life threat and bodily arousal) had six. Factors 1 and 2 had eigenvalues of 3.00 and 1.98, explaining, respectively, 23% and 15% of the total variance (38%). Factors 1 and 2 explained 60% and 40% of the common variance, respectively, and were modestly correlated (r=0.20). Use of a rotated orthogonal solution did not change the number of factors, their item content, and item loadings.

Confirmatory factor analysis was used to replicate the factor solution in the comparison group of non-police-officers; the major goodness-of-fit indexes were in the adequate-to-good-fit range.

As shown in Table 2, the most frequently endorsed items in both groups were feeling frustrated or angry, feeling sadness and grief, and feeling helpless. The least endorsed items in both groups were losing control of one's bowel and bladder and passing out. Most officers ($N=639$, 91%) and comparison subjects ($N=277$, 92%) endorsed one or more of the three items included in DSM-IV criterion A2 (fear, helplessness, or horror). Overall, comparison subjects more frequently endorsed Peritraumatic Distress Inventory items, and their mean level of endorsement was higher than that of the officers. One exception was that the police officers more often reported worrying about the safety of others.

We next examined the distribution of the responses and temporal stability of Peritraumatic Distress Inventory scores. In both groups, most item distributions were positively skewed. However, the distribution of total Peritraumatic Distress Inventory scores was symmetrical in both study groups. The standardized coefficient alpha for the total Peritraumatic Distress Inventory score was 0.75 in officers and 0.76 in comparison subjects. A subgroup of officers ($N=71$) was retested on the Peritraumatic Distress Inventory an average of 391 days ($SD=130$, range=80–585) after initial measure completion. The test-retest correlation coefficient was 0.74, indicating very good temporal stability. A modest decrease in mean score across time was observed ($t=2.76$, $df=70$, $p<0.01$; $d=0.25$).

Sociodemographic Differences on the Peritraumatic Distress Inventory

To test for the effects of age, gender, ethnicity (Caucasian or other) and group (officer or comparison subject), we conducted a two-by-two-by-two analysis of covariance with age as a covariate among the participants with complete sociodemographic data ($N=984$). We could not test the comparison of African American and Hispanic subjects because of small cell sizes for the comparison group. The overall model was significant ($F=9.11$, $df=8$, 984, $p<0.001$). The age covariate was not significant ($F=0.16$, $df=1$, 984, $p>0.05$). No main effect was found for ethnicity ($F=0.11$, $df=1$, 984, $p>0.05$). Main effects were found for gender ($F=11.67$, $df=1$, 984, $p<0.001$) and for group ($F=46.41$, $df=1$, 984, $p<0.001$). Women had higher scores on the Peritraumatic Distress Inventory than men (mean=1.44, $SD=0.74$, compared with mean=1.26, $SD=0.64$) ($d=0.27$), and so did the comparison subjects (mean=1.52, $SD=0.69$) compared with the police officers (mean=1.17, $SD=0.64$) ($d=0.53$). The only significant interaction term was the gender-by-group term ($F=5.78$, $df=1$, 984, $p<0.05$). There was no difference between groups among men, but female officers scored lower (mean=1.37, $SD=0.65$) than their civilian counterparts (mean=1.67, $SD=0.76$) ($d=0.43$).

Convergent and Divergent Validity of the Peritraumatic Distress Inventory

Among police officers, the Peritraumatic Distress Inventory correlated with conceptually related measures, such as peritraumatic dissociation ($r=0.59$, $p<0.001$), Civilian Mississippi Scale score ($r=0.46$, $p<0.001$), and the intrusion ($r=0.47$, $p<0.001$), avoidance ($r=0.47$, $p<0.001$), and hyperarousal ($r=0.42$, $p<0.001$) subscales of the Impact of Event Scale—Revised. These relationships persisted even after we partialled out the variance attributable to the SCL-90-R index of general psychopathology ($r=0.24$ to $r=0.53$, $p<0.001$) and the Peritraumatic Dissociative Experiences Questionnaire index of peritraumatic dissociation ($r=0.26$ to $r=0.34$, $p<0.001$).

The Peritraumatic Distress Inventory scores correlated modestly, or not at all, with conceptually different measures, such as social support ($r=-0.11$, $p<0.05$), physical health ($r=-0.15$, $p<0.05$), and time elapsed since the critical incident ($r=-0.03$, $p>0.05$). Examination of convergent and divergent validity was repeated in the comparison group with results similar to those found in the police officers.

Discussion

Many of the police officers and comparison subjects reported feelings of helplessness, sadness and grief, and frustration and anger; physical reactions such as sweating, shaking, and a racing heart; and being horrified after traumatic exposure. The occurrence and magnitude of such reactions was positively associated with two widely used measures of PTSD symptoms. These results echo the findings of other investigators (8–12, 14–16), most of whom, however, focused on a single type of peritraumatic distress response or did not control for general psychopathology or peritraumatic dissociation.

The Peritraumatic Distress Inventory was internally consistent and stable over time. Although most Peritraumatic Distress Inventory items had good to excellent correlations between item and total scores, a few, such as worry about the safety of others, did not. This finding is consistent with the notion that learning about another person's trauma, in contrast with directly witnessing it, often leads to PTSD. Difficulty controlling bowel and bladder and feeling like passing out were endorsed by fewer participants; these items also had lower item-total correlations, as was found in another study (13). It remains to be seen if such items are more frequently endorsed in other traumatized groups.

It is worthwhile to note that all of the main findings obtained in the group of police officers were replicated in the comparison subjects who were exposed to a variety of traumatic events. This increases confidence in the results and suggests that the Peritraumatic Distress Inventory is applicable to studies of trauma in the general population.

We found moderate differences in responses related to gender and group membership. The women in the comparison group reported more peritraumatic distress than the female police officers, but the men in the comparison group did not differ from the male officers. More research will be needed to determine if female officers are more resilient to trauma than their civilian counterparts.

The most important limitations of the current study involve its cross-sectional design with retrospective report of peritraumatic distress. Recall may decay with time or be biased by current symptom levels (30). Another limitation relates to the requirement that participants complete the PTSD symptom scales in relation to a single event. The potential contribution of critical incidents other than the index event to current self-report of PTSD symptoms is an important and underexplored issue that is particularly salient in studies of highly exposed emergency services personnel.

Compared with peritraumatic dissociation, peritraumatic distress is an understudied phenomenon in the chain of events that may lead to the development of PTSD. The Peritraumatic Distress Inventory provides a tool to examine models of the genesis of PTSD, including the hypothesis that peritraumatic dysphoric arousal may enhance trauma-related memory and sensitize neurobiological systems implicated in the pathogenesis of PTSD.

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References

- Kessler RC, Sonnega A, Bromet E, Hughes M, Nelson CB: Post-traumatic stress disorder in the National Comorbidity Survey. *Arch Gen Psychiatry* 1995; 52:1048–1060
- Marmar CR, Weiss DS, Metzler TJ: The Peritraumatic Dissociative Experiences Questionnaire, in *Assessing Psychological Trauma and PTSD: A Handbook for Practitioners*. Edited by Wilson JP, Keane TM. New York, Guilford, 1997, pp 412–428
- Ozer EJ, Best SR, Lipsey TL, Weiss DS: Predictors of PTSD symptoms in adults: a meta-analysis, in *Proceedings of the 1998 Meeting of the International Society for Traumatic Stress Studies*. Northbrook, Ill, ISTSS, 1998, p 85
- Koopman C, Classen C, Spiegel D: Predictors of posttraumatic stress symptoms among survivors of the Oakland/Berkeley, Calif, firestorm. *Am J Psychiatry* 1994; 151:888–894
- Pitman RK: Post-traumatic stress disorder, hormones, and memory. *Biol Psychiatry* 1989; 26:221–223
- Charney DS, Deutch AY, Krystal JH, Southwick SM, Davis M: Psychobiologic mechanisms of posttraumatic stress disorder. *Arch Gen Psychiatry* 1993; 50:295–305
- March JS: What constitutes a stressor? the “criterion A” issue, in *Posttraumatic Stress Disorder: DSM-IV and Beyond*. Edited by Davidson JRT, Foa EB. Washington, DC, American Psychiatric Press, 1993, pp 37–54
- Bernat JA, Ronfeldt HM, Calhoun KS, Arias I: Prevalence of traumatic events and peritraumatic predictors of posttraumatic stress symptoms in a nonclinical sample of college students. *J Trauma Stress* 1998; 11:645–665
- Brewin CR, Andrews B, Rose S: Fear, helplessness, and horror in posttraumatic stress disorder: investigating DSM-IV criterion A2 in victims of violent crime. *J Trauma Stress* 2000; 13:499–509
- Roemer L, Orsillo SM, Borkovec TD, Litz BT: Emotional response at the time of a potentially traumatizing event and PTSD symptomatology: a preliminary retrospective analysis of the DSM-IV criterion A-2. *J Behav Ther Exp Psychiatry* 1998; 29:123–130
- Solomon Z, Laor N, McFarlane AC: Acute posttraumatic reactions in soldiers and civilians, in *Traumatic Stress: The Effects of Overwhelming Experience on Mind, Body, and Society*. Edited by van der Kolk BA, McFarlane AC, Weisaeth L. New York, Guilford, 1996, pp 102–114
- Ehlers A, Mayou RA, Bryant B: Psychological predictors of chronic posttraumatic stress disorder after motor vehicle accidents. *J Abnorm Psychol* 1998; 107:508–519
- Lehman H: Somatic and psychological symptoms after the experience of life threatening events: a profile analysis. *Victimology* 1985; 10:512–538
- Tucker P, Dickson W, Pfefferbaum B, McDonald NB, Allen G: Traumatic reactions as predictors of posttraumatic stress six months after the Oklahoma City bombing. *Psychiatr Serv* 1997; 48:1191–1194
- Shalev AY, Sahar T, Freedman S, Peri T, Glick N, Brandes D, Orr SP, Pitman RC: A prospective study of heart rate response following trauma and the subsequent development of posttraumatic stress disorder. *Arch Gen Psychiatry* 1998; 55:553–559
- Resnick HS: Acute panic reactions among rape victims: implications for prevention of posttrauma psychopathology. *National Center for PTSD Clinical Quarterly* 1997; 7:41–45
- Weiss DS, Brunet A, Metzler TJ, Best SR, Fagan JA, Marmar CR: Critical incident exposure in police officers: frequency, impact, and correlates, in *Proceedings of the 1999 Meeting of the International Society for Traumatic Stress Studies*. Northbrook, Ill, ISTSS, 1999, p 52
- Green BL: Psychometric review of the Trauma History Questionnaire, in *Measurement of Stress, Trauma, and Adaptation*. Edited by Stamm BH. Lutherville, Md, Sidran, 1996, pp 366–369
- Corcoran CB, Green BL, Goodman LA, Krinsley KE: Conceptual and methodological issues in trauma history assessment, in *International Handbook of Human Response to Trauma*. Edited by Shalev AY, Yehuda R, McFarlane AC. New York, Plenum, 2000, pp 223–232
- Weiss DS, Marmar CR: The Impact of Event Scale—Revised, in *Assessing Psychological Trauma and PTSD: A Practitioner’s Handbook*. Edited by Wilson JP, Keane TM. New York, Guilford, 1997, pp 399–411
- Vreven DL, Gudanowski DM, King LA, King DW: The civilian version of the Mississippi PTSD Scale: a psychometric evaluation. *J Trauma Stress* 1995; 8:91–109
- Derogatis LR: *SCL-90-R: Administration, Scoring, and Procedures Manual*, 3rd ed. Towson, Md, Clinical Psychometric Research, 1994
- Kulka RA, Schlenger WE, Fairbank JA, Hough RL, Jordan BK, Marmar CR, Weiss DS: *Trauma and the Vietnam War Generation: Report of Findings From the National Vietnam Veterans Readjustment Study*. New York, Brunner/Mazel, 1990
- Reynolds WM: Development of reliable and valid short forms of the Marlowe-Crowne Social Desirability Scale. *J Clin Psychol* 1982; 38:119–125

25. Ware JE, Kosinski M, Keller SD: A 12-item Short-Form Health Survey—construction of scales and preliminary tests of reliability and validity. *Med Care* 1996; 34:220–233
26. Benjamini Y, Hochberg Y: Controlling the false discovery rate—a practical and powerful approach to multiple testing. *J Royal Statistical Society Series B: Methodological* 1995; 57: 289–300
27. Dempster AP, Laird NM, Rubin DB: Maximum likelihood from incomplete data via the EM algorithm. *J Royal Statistical Society B: Methodological* 1977; 39:1–38
28. Marmar CR, Weiss DS, Metzler TJ, Ronfeldt HM, Foreman C: Stress responses of emergency services personnel to the Loma Prieta earthquake interstate 880 freeway collapse and control traumatic incidents. *J Trauma Stress* 1996; 9:63–85
29. Brunet A, Weiss D, Metzler T, Best S, Fagan J, Vedantham K, Marmar CR: An overview of the Peritraumatic Emotional Distress Scale. *Dialogues in Clin Neurosci* 2000; 2:44–45
30. Southwick SM, Morgan CA III, Nicolaou AL, Charney DS: Consistency of memory for combat-related traumatic events in veterans of Operation Desert Storm. *Am J Psychiatry* 1997; 154: 173–177