0022-3018/01/1892-99
THE JOURNAL OF NERVOUS AND MENTAL DISEASE
Copyright © 2001 by Lippincott Williams & Wilkins
Vol. 189, No. 2
Printed in U.S.A.

Combat Trauma: Trauma with Highest Risk of Delayed Onset and Unresolved Posttraumatic Stress Disorder Symptoms, Unemployment, and Abuse Among Men

HOLLY G. PRIGERSON, PH.D.,[1,2,3] PAUL K. MACIEJEWSKI, PH.D.,[3] and ROBERT A. ROSENHECK, M.D.[1,2,4]

Little is known about the risk and course of posttraumatic stress disorder (PTSD), and other forms of dysfunction, associated with combat trauma relative to other traumas. Modified versions of the DSM-III-R PTSD module from the Diagnostic Interview Schedule and Composite International Diagnostic Interview were administered to a representative national sample of 5877 persons 15–54 years old in the part 2 subsample of the National Comorbidity Survey. Of the weighted subsample, 1703 men reported a traumatic event. The risk of PTSD and other forms of dysfunction were compared for men who nominated combat as their worst trauma versus men nominating other traumas as worst, controlling for confounding influences. Men reporting combat as their worst trauma were more likely to have lifetime PTSD, delayed PTSD symptom onset, and unresolved PTSD symptoms, and to be unemployed, fired, divorced, and physically abusive to their spouses than men reporting other traumas as their worst experience.
— *J Nerv Ment Dis* 189:99–108, 2001

Although exposure to combat is a well-established risk factor for posttraumatic stress disorder (PTSD; Fontana and Rosenheck, 1994; Helzer et al., 1987; Kessler et al., 1995; Kulka et al., 1990; Mellman et al., 1992), little is known about the prevalence and course of PTSD or the additional forms of disability associated with combat trauma relative to other traumas. In spite of a growing recognition that the nature of the traumatic exposure is a primary determinant of PTSD onset and outcome (Green et al., 1990; Kilpatrick et al., 1992; March, 1992), few studies have examined the relative risks of developing PTSD across a variety of commonly experienced traumas. Kessler et al. (1995) found that men exposed to combat had among the highest conditional probabilities of developing PTSD. What remains unknown is whether the risk of developing PTSD associated with combat trauma differs significantly from the risk associated with specific other traumas, controlling for known confounding influences.

If few studies have examined the relative risks of PTSD between traumas, even fewer have compared the onset and duration of PTSD by trauma type, much less with reference to combat trauma in particular. Despite discrepant findings concerning the onset of combat-related PTSD—with some claiming a delay in onset (Kolb and Mutalipassi, 1982; Pomerantz, 1991; Solomon et al., 1989) and others refuting this claim (Bremner et al., 1996; Kluznik et al., 1986)—ample evidence consistently attests to the enduring nature of PTSD symptoms among combat veterans (Bremner et al., 1996; Davidson et al., 1991; Helzer et al., 1987; Kluznick et al., 1986; Kulka et al., 1990; Zlotnick et al., 1999). A study by Bremner et al. (1996) of veterans seeking treatment for combat-related PTSD found delayed PTSD symptom onset was rare and, after onset, PTSD symptom levels tended to remain chronic and unremitting. To the best of our knowledge, no study has compared the likelihood of delayed onset and unresolved PTSD symptoms among a representative community sample of men with combat trauma to that associated with specific other traumas.

The limited number of studies that have examined the persistence of PTSD by trauma type have shown that some forms of trauma are associated with chronic PTSD whereas others are not. For example, Helzer et al. (1987) in the St. Louis Epidemiologic

[1] VISN 1 Mental Illness Research, Education and Clinical Center, and the Northeast Program Evaluation Center, Veterans Affairs Medical Center (182), 950 Campbell Avenue, West Haven, Connecticut 06516.
[2] Department of Psychiatry, Yale University School of Medicine, 34 Park Street, New Haven, Connecticut 06519. Send reprint requests to Dr. Prigerson, Rm. 522, Connecticut Mental Health Center, 34 Park Street, New Haven, Connecticut 06519.
[3] The Donaghue Women's Health Investigator Program, Yale University School of Medicine, P.O. Box 208091, New Haven, Connecticut 06520.
[4] Department of Epidemiology and Public Health, Yale University School of Medicine, 60 College Street, New Haven, Connecticut 06520.
This work was supported in part by R01 MH56529 (NIMH: HGP) and National Comorbidity Survey grants R01 MH/DA46376 and R01 MH49098 (NIMH), supplement to R01 MH/DA46376 (NIDA), and 90135190 (W. T. Grant Foundation).

Catchment Area (ECA) study found that combat and physical assault were events associated with a higher frequency of chronic (lasting longer than 3 years) PTSD compared with other events. Similarly, using the North Carolina ECA data, Davidson et al. (1991) reported that combat, seeing someone hurt or killed, or being the victim of a physical attack were events associated with chronic PTSD symptoms, whereas an unspecified category of "miscellaneous" events was not. Although the clustering of events as chronic versus nonchronic suggests differences in the duration of PTSD by trauma type, it does not provide an explicit test for differences in onset or resolution of PTSD symptoms between particular traumas, while adjusting for significant confounding factors.

There also has been a paucity of research comparing the effects of differing traumatic exposures on adverse outcomes aside from PTSD. Although research has demonstrated the high rates of psychiatric comorbidity among people with PTSD (Helzer et al., 1987; Kessler et al., 1995; Kulka et al., 1990; Sierles et al., 1983; True et al., 1988), we were unable to locate a single study that compared the risk of other psychiatric diagnoses associated with combat trauma to the risks posed by other traumas. Combat trauma and/or combat-related PTSD have been shown to be associated with occupational morbidity (Engel et al., 1999) and interpersonal violence in relationships with female partners (Beckham et al., 1998; Byrne and Riggs, 1996). Nevertheless, the risk of these other forms of disability associated with combat trauma relative to other traumatic experiences has not been reported in the literature.

The present study uses data from a nationally representative sample to compare the likelihood of meeting diagnostic criteria for lifetime PTSD between men who name combat as their most upsetting lifetime experience and other common traumas named as the respondent's most upsetting lifetime experience, controlling for important confounding influences. The risk of delayed onset and unresolved PTSD symptomatology, as well as other forms of disability (*i.e.*, other psychiatric disorders, occupational and marital difficulties) associated with naming combat trauma relative to other traumas as the male respondent's most disturbing life event are also examined.

Subjects and Methods

Sample

The data come from the National Comorbidity Survey (NCS; Kessler et al., 1994), a survey designed to study the distribution, correlates, and consequences of psychiatric disorders in a nationally representative sample of the United States. The survey was based on a stratified, multistage area probability sample of persons aged 15 to 54 in the noninstitutionalized civilian population. From 1990 through 1992, the NCS surveyed 8098 persons. The response rate was 82.4%. After study procedures were fully explained, written informed consent was obtained from all respondents and also from parents of minors. Further details about the NCS are provided elsewhere (Kessler et al., 1994, 1995).

All 8098 respondents were administered the part 1 interview. Part 2 included a more thorough assessment of risk factors and secondary diagnoses, including PTSD, not included in the core diagnostic interview. The NCS sample for part 2 (N = 5877 respondents) was drawn from a subsample of all respondents aged 15 to 24 years (99.4% of whom completed part 2), all others who screened positive in part 1 for a lifetime prevalence of any psychiatric disorder (98.1% of whom completed part 2), and a random subsample of other respondents (99% of whom completed part 2).

The NCS data were weighted to adjust for variation in within-household and between-household probabilities of selection and differential nonresponse. A specific nonresponse survey was conducted by the NCS to determine sources of systematic bias (Kessler et al., 1994). Weights were provided in the NCS to adjust for the nonresponse biases detected in the survey, for the probability of selection into the part 2 subsample, and to make the part 2 data approximate the national population distributions of the cross-classification of age, sex, race or ethnicity, marital status, education, living arrangements, region, and urbanicity as defined by the 1989 U.S. National Health Interview Survey (U.S. Department of Health and Human Services, 1992). The weighted part 2 sample was used in all the analyses conducted for the present study. Sample sizes presented will refer to the sum of the weights for individuals in each category (N_w, where $_w$ refers to the weighted sample).

Given our focus on the effects of combat trauma, and that no women in the NCS reported combat trauma, we restricted the sample to men (N_w = 2806). We then limited the sample to only those men who had reported a traumatic event (N_w = 1703), thereby focusing the analyses on a comparison of the relative effects of commonly experienced traumas.

Assessments of Psychiatric Diagnoses and Traumatic Events

The NCS diagnostic interview was a modified version of the Composite International Diagnostic In-

terview (CIDI; Robins et al., 1988; World Health Organization, 1990a). The NCS assessed the following disorders: affective disorders (major depressive disorder, dysthymia, bipolar disorder); anxiety disorders (generalized anxiety disorder, panic disorder, phobia); nonaffective psychosis (schizophrenia, schizophreniform disorder, schizoaffective disorder, delusional disorder, atypical psychosis); and substance use disorders (alcohol abuse without dependence, alcohol dependence, drug abuse without dependence, drug dependence). All diagnoses were based on DSM-III-R criteria and generated by the CIDI diagnostic program (World Health Organization, 1990b). Field trial data have confirmed their reliability and validity (Wittchen, 1994).

The NCS used the modified version of the Revised Diagnostic Interview Schedule (DIS; Breslau et al., 1991) to assess PTSD. DIS symptom questions were used to evaluate PTSD criteria B through D, and DIS coding rules for these criteria were applied to obtain a diagnosis of PTSD. Criteria B through D were evaluated for only one event per respondent. Additional questions asked how soon after the traumatic exposure did PTSD symptoms begin. Consistent with the DSM-III-R and DSM-IV, any response greater than 6 months was coded as "delayed onset" of PTSD symptoms. Respondents were also asked how long the symptoms continued. Duration was examined with respect to two dichotomous outcomes: a) PTSD symptoms persisting longer than 2 years; and b) "still ongoing," or "unresolved," PTSD symptomatology at the time of the assessment.

The NCS asked questions for each of 11 types of traumatic events, with a 12th open-ended question about "any other terrible experience that most people never go through." Interviewers asked respondents whether each of the 12 events referred to by a number appearing on a list in a booklet had occurred to them. Using a number rather than mentioning the experience was intended to reduce the tendency to underreport certain types of experiences (Kessler et al., 1995). When a respondent reported experiencing more than one event, s/he was asked which of these events was the "most upsetting" and PTSD symptoms were rated in response to the most disturbing event.

To simplify presentation and enhance statistical power, we clustered the most upsetting traumas into the following nine event types: a) combat in war (N_w = 96); b) life-threatening accident (N_w = 292); c) fire, flood, natural disaster (N_w = 178); d) witnessing someone being badly beaten or killed (N_w = 492); e) rape or sexual molestation (N_w = 32); f) serious attack or assault or being threatened with a weapon, held captive, or kidnapped (N_w = 273); g) physical abuse or serious neglect as a child (N_w = 58); h) "any other terrible experience that most people never go through" (N_w = 152); and i) a great shock because one of these events happened to someone close to you (N_w = 130).

Additional Assessments

Other analyzed variables included age, race (Caucasian versus other races), urbanicity, socioeconomic status (SES) in family of origin, number of traumas experienced, unemployment, having been fired or lost a business in the last year, ever having been divorced, or abuse of one's wife. Urbanicity was defined as residence in a county with 250,000 or more residents versus areas with fewer residents. Low SES in the family of origin was coded positively if either the major source of financial support prior to 15 years of age was welfare or financial aid, a foster home or orphanage, or if the primary wage earner had less than 12 years of formal schooling and a Census Occupation Code of 300 or higher (*e.g.*, clerical, laborers). Men were asked to review a list of behaviors towards their spouse (current spouse for married men; prior spouse for men previously married). Those who responded that they grabbed, pushed, shoved, threw things at, slapped, spanked, kicked, bit, hit, beat-up, choked, burned, or scalded their spouse "often" or "sometimes" were coded "1 = Yes" for wife abuse. Men who answered "never" or "rarely" to these behaviors were coded "0 = No." Each of these measures was identified by us or others (Breslau et al., 1991; Byrne and Riggs, 1996; Davidson et al., 1991; Foy et al., 1984; Kulka et al., 1990; World Health Organization, 1990a) as associated with exposure to combat and/or the onset of PTSD.

Analyses

The lifetime prevalence of PTSD and other common psychiatric disorders, current unemployment, having being fired or lost one's business in the last year, having been divorced, and having been physically abusive to one's spouse was compared among men who reported combat trauma as their most upsetting life experience (N = 96) and men who reported one of the remaining eight types of traumatic events as their most upsetting experience (N = 1607). All analyses were conducted using SAS version 6.12 (SAS Institute, 1996) procedures that allowed for the inclusion of weighting variables.

Men who nominated combat were compared with men who nominated other traumas as their most disturbing lifetime experience on relevant sociode-

TABLE 1
Rates of Psychiatric Disorders, Occupational Problems, and Marital Problems Associated with Index Trauma among Traumatized Men

		Lifetime Psychiatric Disorders (%)				Occupational and Marital Problems (%)			
Index Trauma	N^a	PTSD	Affective Disorder	Anxiety Disorder	Substance Abuse	Currently Unemployed	Recently Fired	Ever Divorced	Spousal Abuse
Combat	96	41.8	22.3	14.0	35.8	20.2	13.6	39.0	15.2
Life-threatening accident	292	5.5	15.5	23.8	53.7	7.9	9.7	18.8	7.6
Natural disaster	178	3.9	10.8	21.3	35.2	13.4	4.9	9.5	4.0
Witnessing	492	6.1	19.4	26.1	38.9	7.7	4.4	11.3	5.4
Raped or sexually molested	32	32.5	44.8	26.7	52.5	4.8	3.0	12.0	3.7
Physical attack, threatened with weapon, or held captive	273	1.6	17.4	24.3	49.3	4.4	4.3	12.0	10.4
Physically abused or seriously neglected as child	58	24.2	40.7	40.7	59.7	2.6	4.0	28.3	1.5
Other qualifying trauma	152	5.1	25.0	26.7	40.4	8.3	6.3	12.2	8.0
Shock due to trauma of close other	130	4.4	16.4	23.6	43.6	3.0	2.2	7.8	3.9

[a]Based on sum of weights.

mographic characteristics and the number of traumas experienced, using *t*-tests for continuous measures and the χ^2 statistic for categorical measures to determine whether the differences between these two groups were statistically significant.

Through a series of analyses, odds ratios for each dichotomous outcome (*i.e.*, lifetime PTSD, delay in onset [Y/N], unresolved PTSD symptomatology [Y/N], each lifetime psychiatric diagnosis, being unemployed, fired, divorced, and abusive to one's spouse) were estimated using SAS's logistic regression procedure. The aim of each analysis was to compare the effect of combat trauma directly to one other category of trauma (*i.e.*, either "any trauma other than combat," or one of the 8 specific other traumas). Therefore, each logistic regression model was based on a sample restricted to those nominating combat trauma and those nominating only one other specific category of trauma, excluding all others. Each model included a dummy variable for combat trauma as the most upsetting experience nominated, leaving the remaining category of trauma to serve as the excluded (reference) category. In this way, the odds reported refer to the risks associated with combat trauma relative to other traumas, both unadjusted and adjusted for the number of traumas, age, race, urbanicity, and low SES of family of origin.

Results

Comparison Between Men with Combat Trauma and Men with Other Traumas on Variables of Interest

Psychiatric Morbidity: Of the 96 men naming combat trauma as their worst lifetime experience, 40 (41.8%) met diagnostic criteria for PTSD at some point in their life, making combat the event associated with the highest prevalence of PTSD among men reporting traumatic experiences (Table 1). Although 22.3% of men who reported combat as their worst lifetime experience met criteria for an affective disorder, this rate was roughly half the prevalence of affective disorder among men who had named being raped or sexually molested (44.8%), or physically abused or seriously neglected as a child (40.7%) as their worst trauma. Combat was the trauma associated with the lowest rate of anxiety disorders (excluding PTSD; 14%), and was second only to life-threatening accidents as the trauma with the lowest rate of substance abuse (35.8% for combat trauma). Men with combat trauma reported as their worst lifetime experience clearly had the highest rates of unemployment at the time of the assessment (20.2%), having been fired in the last year (13.6%), having been divorced (39%) and physically abusive to their spouses (15.2%).

Background Characteristics: Men who reported combat trauma as their most upsetting lifetime experience were significantly ($p < .05$) older, less likely to be Caucasian, more likely to have been raised in a family of low SES, and reported a greater number of other traumatic events than men who reported other traumas as their most upsetting life experience (Table 2). Consequently, we adjusted for these confounding influences in the multivariate models.

Risks of Psychiatric Disorders for Combat Trauma Relative to Specific Other Traumas

The adjusted odds displayed in Table 3 indicate that men with combat trauma named as their most upsetting life event were over 7 times more likely ($p < .001$) to meet criteria for PTSD in their lifetime than men who reported other traumatic experiences

TABLE 2
Variables Potentially Confounded with Combat Trauma among Traumatized Men

Measure	Index Trauma: Combat (N^a = 96)	Index Trauma: Other (N^a = 1607)	Comparative Test: t or χ^2	Comparative Test: df
Age; mean (SD)	41.9 (4.7)	32.6 (10.5)	17.08***	160
Race, Caucasian; N^a (%)	69 (71.4%)	1300 (80.9%)	5.21*	1
Urban; N^a (%)	33 (34.1%)	485 (30.2%)	0.67	1
Low SES, family of origin; n^a (%)	47 (48.5%)	447 (27.8%)	19.01***	1
Number of traumas; mean (SD)	3.74 (1.85)	2.25 (1.54)	7.72***	103

[a]Based on sum of weights.
*p <.05; ***p <.001.

TABLE 3
Odds Ratios for Psychiatric Disorders Associated with Combat Trauma Relative to Other (Listed) Traumas[a]

Reference Trauma	Lifetime Psychiatric Disorder Associated with Combat Trauma: PTSD Unadjusted O.R.	PTSD Adjusted O.R.	Affective Disorder Unadjusted O.R.	Affective Disorder Adjusted O.R.	Anxiety Disorder Unadjusted O.R.	Anxiety Disorder Adjusted O.R.	Substance Abuse Unadjusted O.R.	Substance Abuse Adjusted O.R.
Any trauma other than combat	11.39***	7.38***	1.22	0.72	0.48*	0.39**	0.70+	0.59*
Life-threatening accident	12.25***	9.38***	1.56	0.91	0.52*	0.40*	0.48***	0.35***
Natural disaster	17.50***	11.38***	2.35*	0.68	0.60	0.31*	1.02	0.46+
Witnessing	11.11***	8.90***	1.19	0.77	0.46*	0.36**	0.88	0.76
Raped or sexually molested	1.49	2.14	0.35*	0.30*	0.45+	0.67	0.50+	0.51
Physical attack, threatened with weapon, or held captive	45.50***	60.19***	1.35	0.78	0.51*	0.48+	0.57*	0.54*
Physically abused or seriously neglected as child	2.25*	3.55*	0.42*	0.32*	0.24***	0.16***	0.38**	0.27**
Other qualifying trauma	13.56***	14.14***	0.86	0.37*	0.45*	0.36*	0.82	0.93
Shock due to trauma of close other	15.47***	37.94***	1.45	1.98	0.53+	0.44+	0.72	0.91

[a]Analyses adjusted for age, race, socioeconomic status of family of origin, number of traumas.
+p < .10; *p < .05; **p < .01; ***p < .001.

as their most upsetting life event. When examined individually, the results reveal that men who named combat trauma as their most disturbing life event had a significantly greater likelihood of lifetime PTSD than each of the other listed most upsetting traumas, with the exception of men who had been raped or sexually molested. The most striking contrast revealed that men who named combat trauma as their worst life event had a 60.2 times greater likelihood of lifetime PTSD than men who had named being physically attacked or held captive as their most upsetting experience.

The adjusted risk of a lifetime affective disorder was lower for men who named combat trauma as their most upsetting life event relative to men who named other traumas as their most upsetting event. More specifically, men who had been raped, physically abused, or seriously neglected as a child or who had experienced an undefined "other qualifying trauma" as their worst experience had significantly (p < .05) greater odds of a lifetime affective disorder than men reporting combat trauma. The adjusted risk of a lifetime anxiety disorder was nearly 2.6 times (p < .01) lower for men who named combat trauma compared with men with other traumas as their worst experience. Men who reported their most disturbing lifetime experience as having been raped or sexually molested were the only group for whom the odds of an anxiety disorder were not even marginally lower than for men who named combat trauma as their most upsetting event. Interestingly, men who reported their worst experience to be combat trauma had significantly (p < .05) lower odds of a substance abuse disorder than men who reported other traumas as their worst experience. The most significant difference was between men who had a life-threatening accident (possibly a consequence of substance abuse) and those naming combat trauma as their worst lifetime experience, for which the odds were nearly 2.9 times (p < .001) lower for men with combat trauma.

Effects of Combat Trauma Relative to Other Traumas on the Onset, Duration, and Resolution of PTSD Symptoms

The adjusted odds ratios displayed in Table 4 indicate that men who name combat trauma as their most upsetting lifetime experience were nearly 4.5 times (p < .05) more likely to have a delayed onset

TABLE 4

Odds Ratios for Onset and Duration of PTSD Symptomatology Associated with Combat Trauma Relative to Other Traumas[a]

	Onset and Duration of PTSD Symptomatology					
	Delayed Onset 20/172[b] (11.8%)		Duration of Symptoms > 2 yr 45/124[b] (36.0%)		Unresolved Symptoms 48/172[b] (28.0%)	
Reference Trauma	Unadjusted O.R.	Adjusted O.R.	Unadjusted O.R.	Adjusted O.R.	Unadjusted O.R..	Adjusted O.R.
Any Trauma Other than Combat	2.93*	4.42*	3.27**	2.10	1.89+	2.34*

[a]Analyses adjusted for age, race, socioeconomic status of family of origin, number of traumas.
[b]Based on sum of weights
*$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$.

TABLE 5

Odds Ratios for Occupational and Marital Problems Associated with Combat Trauma Relative to Other (Listed) Traumas[a]

	Occupational and Marital Problems Associated with Combat Trauma							
	Unemployed		Recently fired		Ever Divorced		Spousal Abuse	
Reference Trauma	Unadjusted O.R.	Adjusted O.R.	Unadjusted O.R.	Adjusted O.R.	Unadjusted O.R.	Adjusted O.R.	Unadjusted O.R.	Adjusted O.R.
Any trauma other than combat	3.25***	3.55***	2.77**	2.77*	4.27***	2.52***	2.64**	2.41*
Life-threatening accident	2.95***	4.06**	1.46	1.12	2.75***	1.78+	2.18*	2.57*
Natural disaster	1.64	0.49	3.06*	1.14	6.06***	3.55***	4.34**	7.99**
Witnessing	3.05***	3.02**	3.43**	9.08***	5.03***	3.68***	3.14**	3.78**
Raped or sexually molested	5.01*	17.39*	5.06	9.81+	4.68**	4.81*	4.65	16.42*
Physical attack, threatened with weapon, or held captive	5.46***	5.49**	3.46**	3.54+	4.67***	2.69**	1.55	1.95
Physically abused or seriously neglected as child	9.51**	235.09**	3.72+	20.08*	1.62	1.98	12.04*	132.85**
Other qualifying trauma	2.81**	2.66	2.32*	8.23*	4.59***	2.80**	2.06	6.98**
Shock due to trauma of close other	8.11***	88.76**	7.06**	44.93**	7.58***	5.99***	4.43*	14.83**

[a]Analyses adjusted for age, race, socioeconomic status of family of origin, number of traumas.
+$p < .10$; *$p < .05$; **$p < 0.01$; ***$p < .001$.

of PTSD symptoms than men reporting other traumas, with 9/39 (22.1%) of men reporting PTSD symptom onset more than 6 months after combat exposure. Compared with men who named other traumas as their worst experience, those who named combat trauma were not significantly more likely to have their PTSD symptoms last longer than 2 years, when confounding influences were taken into account. However, the adjusted risk of unresolved PTSD symptoms at the time of the interview was 2.3 times ($p < .05$) greater for men reporting combat trauma as their most upsetting life event compared with men reporting other traumas as their worst experience, with 15/40 (38.4%) of men with combat trauma reporting that their PTSD symptoms at the time of the assessment were "still ongoing."

Occupational Instability

Men with combat trauma named as their worst event were approximately 3.6 ($p < .001$) times more likely to have been unemployed in the past year than men who named any one of the eight other traumas as their worst event, taken as a group (Table 5). The odds of being unemployed were significantly greater for men naming their most disturbing event as combat trauma compared with men naming each of the other traumas as their most upsetting event, with two exceptions: a) exposure to a natural disaster and b) an "other qualifying trauma." Men who reported childhood abuse as their worst experience differed the most from those naming this to be combat trauma, with the latter group being 235 ($p < .01$) times more likely to be unemployed than the former group (which had the lowest rate of unemployment among these traumatized men—2.6% in Table 1). Similarly, men reporting combat trauma as their most severe traumatic exposure were approximately 2.8 times ($p < .05$) more likely to have been fired in the last year than men reporting other traumas as their worst life event.

Marital Problems: Divorce and Spouse Abuse

The odds of being divorced were significantly (2.5 times; $p < .05$) greater for men reporting their most disturbing experience to be combat compared with men who named the other traumas as their worst event, considered as a group; and six of the eight

other traumas, more specifically (Table 5). Men who named a life-threatening accident as their most disturbing lifetime experience were only marginally ($p < .10$) less likely to be divorced, and those who nominated physical abuse or serious neglect as a child as the most upsetting experience did not present a significantly greater risk for divorce than men who nominated combat. The odds of being physically abusive to one's spouse were significantly ($p < .05$) greater for men reporting combat as their worst experience than for men reporting seven of the eight other traumas as their worst experience. The exception was that men who were physically attacked or held captive were not significantly less likely to perpetrate abuse than men naming combat trauma as their most upsetting experience. By far the greatest difference in risk for spousal abuse was between men with combat trauma named as their worst event and those who named having been physically abused or neglected as children, with the latter group being approximately 133 times ($p < .01$) less likely than men naming combat trauma to inflict physical harm on their wives.

Discussion

The results of this study indicate that men who nominate combat exposure as their most disturbing lifetime experience have the highest risk of meeting lifetime criteria for PTSD, that their onset of PTSD symptoms is more likely to be delayed than it is for men nominating other traumas, and that they are more likely to have PTSD symptoms "still ongoing" than men most traumatized by other events. Although combat trauma, when chosen as the most disturbing life experience, appears to be associated with a generally lower risk of affective, anxiety, and substance abuse disorders, it presents a relatively higher risk of occupational and marital difficulties. Below these findings are discussed in greater detail.

Risk of Psychiatric Morbidity

Although prior studies have reported high rates of PTSD associated with combat exposure (Helzer et al., 1987; Kessler et al., 1995; Kulka et al., 1990; Mellman et al., 1992), the present study confirms that the *relative* risk of PTSD is greater for men reporting combat as their worst lifetime experience than for men reporting other experiences as their most disturbing life event. In a recent study by Breslau et al. (1998) "assaultive violence" was the trauma type shown to present the greatest risk of PTSD. However, because "assaultive violence" included rape, physical attack, and military combat, the differential risk of PTSD between these events could not be determined.

By testing for differences between these three types of assaultive violence, we learn that men who report combat as their worst lifetime experience are at significantly greater risk of PTSD than men reporting their worst life event to have been a physical attack but not at significantly greater risk than those reporting rape or sexual molestation. Taken together, the results of this study indicate that rape is second to combat in the likelihood of PTSD onset. By contrast, although the traumatizing features of a physical attack would appear to resemble those of combat trauma, the greatest difference in risk of PTSD among the worst lifetime experiences was between combat trauma and physical attack. Combat trauma may involve a more extreme and/or longer duration of, and/or repeated exposure to, brutality than is involved in a physical attack.

Although several studies have reported the high rates of comorbidity among persons with PTSD (Helzer et al., 1987; Kessler et al., 1995; Kulka et al., 1990; Sierles et al., 1983; True et al., 1988), little is known about the ways in which different traumatic exposures influence the likelihood of other psychiatric disorders. We found that the adjusted risk of other psychiatric disorders, particularly anxiety disorders, was lower for men with combat trauma than for men reporting other traumas as their worst lifetime experience. This is consistent with Kluznick et al. (1986), who found PTSD was not significantly associated with other mental disorders in a long-term follow-up study of prisoners of war. They also concur with the studies of Mellman et al. (1992) and Breslau and Davis (1987) who found the psychiatric consequences of combat trauma to be concentrated in the high risk of PTSD.

Despite studies that indicate the high rates of substance abuse among veterans with PTSD (Jordan et al., 1991; Kulka et al., 1990; Sierles et al., 1983; True et al., 1988), we found significantly lower rates of substance abuse disorders among men reporting combat as their worst experience compared with men reporting other traumas as their most upsetting life event on average, and a life-threatening accident, physical attack, or physical abuse as a child, in particular. The lower relative risk of substance abuse among men reporting combat trauma versus other traumas as their worst experience remained statistically significant in additional analyses that adjusted for other lifetime psychiatric disorders. Thus, both when the higher prevalence of PTSD among combat veterans is taken into account, as well as when it is not, men reporting their most disturbing life event to be combat have a significantly

lower probability of meeting lifetime criteria for a substance abuse disorder than men naming other traumas. This is not to say that men nominating combat as their most severe trauma did not have high rates of substance abuse, because 35.8% of these men did meet lifetime criteria for a substance abuse disorder. Nevertheless, the prevalence and *relative* risk of substance abuse was lower among men with combat trauma than among the men who experienced other traumas as their most disturbing lifetime experience.

Delay, Duration, and Resolution of PTSD Symptoms

In their studies of war veterans, Bremner et al. (1996) and Kluznik et al. (1986) found little or no evidence of delayed onset PTSD. The results of this study indicate that the 22.1% of men nominating combat as their most severe trauma reported a delay in onset of PTSD symptoms, and that both the adjusted and unadjusted risk of a delay in the onset of PTSD symptoms was significantly greater than the risk for men who nominated non-combat-related traumas as their worst experience. Other researchers have documented the existence of a delayed onset PTSD subtype among war veterans (Kolb and Mutalipassi, 1982; Pomerantz, 1991; Solomon et al., 1989). For example, Solomon et al. (1989) reported a 10% delay in PTSD onset among a patient sample of Israeli soldiers. Potential differences between treatment-seeking and community samples, and in the operationalization of "delayed" PTSD onset, may have contributed to higher rates of delayed PTSD onset found in this study compared with elsewhere. In the present study, consistent with the DSM-IV, a delay reflected the subject's endorsement of an onset of PTSD symptoms more than 6 months after the traumatic exposure. By contrast, in the Kluznik et al. (1986) study symptom onset was considered immediate if symptoms began upon repatriation, though repatriation could have been several months or years after combat exposure.

Bremner et al. (1992) and Marmar et al. (1994) have noted that combat soldiers often engage in distancing maneuvers such as "peritraumatic dissociation," which protect them from awareness of the full impact of the event, and temporarily disconnect them from the feelings and emotions related to the trauma—though dissociation heightens the risk of subsequently developing PTSD. Entirely consistent with these dissociative phenomena (Bremner et al., 1992; Marmar et al., 1994), the results of this study indicate that men nominating combat as their most severe trauma have a greater likelihood of a delayed PTSD symptom onset, though, ultimately, the odds of developing PTSD are higher for them than for men naming other traumas as their most disturbing life event. A possible explanation for the greater likelihood of a delay in symptomatic presentation after the traumatic exposure may reflect an absence of an opportunity to process the event (*e.g.*, because of repeated and/or multiple traumas; being consumed by efforts to stay alive)—suggesting that many individuals with delayed onset PTSD may have been exposed to more intense and/or prolonged, essentially more overwhelming, experiences. In addition, inhibited processing of the trauma may itself augment the risk of developing PTSD.

In a prior study of PTSD using data from the NCS, Kessler et al. (1995) found that one-third of the respondents with an index episode of PTSD failed to recover even after many years. Similarly, Breslau et al. (1998) found the median time to the remission of PTSD was 25 months. In the present study, we found that although the unadjusted risk of PTSD symptoms lasting longer than 2 years was significantly greater among men with combat trauma compared with men reporting other traumas as their most disturbing life event, once confounding factors (*e.g.*, the number of other traumas) were taken into account, the risk of long-lasting PTSD symptoms was not significantly elevated for these men. However, the adjusted risk of "still ongoing" PTSD symptoms was significantly greater for men who reported combat trauma than for men who reported the other traumas as their most upsetting life event. Although the NCS did not contain information on the war in which the combat had occurred, given that the respondents were less than 54 years old and that the NCS was assessed in the early 1990s, combat exposure was most likely to have occurred in the Vietnam War. In light of the fact that the combat exposure was likely to have been two to three decades earlier, and that it was probably among the historically earliest of the reported traumas, it is striking that 38.4% of men reporting combat as their most severe trauma reported unresolved PTSD symptoms, and that they were the group of traumatized men who were at relatively greater risk for "still ongoing" PTSD symptoms.

Unemployment, Divorce, and Spousal Abuse

Although the adverse impact of PTSD on other forms of functioning has been reported (Davidson et al., 1991; Engel et al., 1999; Helzer et al., 1987), the risks of other forms of disability associated with combat trauma relative to other traumatic experiences have not been studied. The results of this study indicate that men with combat trauma are sig-

nificantly less likely than men reporting other traumas as their most disturbing life event to be currently employed. These findings are consistent with the occupational morbidity observed by Engel et al. (1999) in his study of Gulf War veterans, although Engel et al. (1999) did not examine the effects of combat trauma, *per se*, nor its effects relative to other traumas. The results also provide new information indicating that combat is the type of most severe trauma representing the greatest risk of divorce among men. It also was shown that men most traumatized by combat are more prone to physical aggression in relationships with their wives than men most traumatized by other events. These results are consistent with those described by Byrne and Riggs (1996), who found escalated violence towards female partners among Vietnam veterans who had been traumatized in combat.

Study Limitations and Future Directions

Several limitations of the study deserve mention. First, the results are based on respondents' lifetime recall of events and the symptoms associated with them. As noted by others (McFarlane, 1988; Southwick et al., 1997), persons with more elevated PTSD symptoms tend to have better recall of traumatic events, thus inflating the associations between the two. These findings suggest a need for longitudinal, prospective studies to confirm the relationship between traumatic exposures (which were not well-defined with respect to duration, frequency, or specific circumstances of the exposure in the NCS) and the onset of PTSD symptomatology observed in this cross-sectional, retrospective study. Furthermore, the stigma associated with such outcomes as being physically abusive to one's wife suggests that these events may have been underreported. Future studies using objective records of spousal abuse (*e.g.*, police reports) would help to validate the findings presented in this report.

In addition, PTSD was assessed with respect to a single trauma. For respondents who had multiple traumas, PTSD was assessed for the "most upsetting" traumatic event. Because respondents were forced to select only their most disturbing trauma, this resulted in an underestimate of the potential number of cases of PTSD; that is, cases of PTSD from traumas not nominated as worst by those with multiple traumas were not included. Selection of the most upsetting trauma also implied an overestimate for the associations between each traumatic event and the likelihood of PTSD. Consequently, the rates of PTSD reported for each trauma in this report would be inflated relative to the average or "typical" experience of each of these traumas. As Kessler et al. (1995) note: "The only way to obtain unbiased estimates of the extent to which traumas of particular types are likely to lead to PTSD is to obtain data on 'typical' traumas rather than 'most upsetting' traumas. . . . A complete assessment of trauma history and whether PTSD occurred after each lifetime trauma would provide much better information. However, this would be a substantial task. . . This should be a goal of future epidemiologic research on PTSD" (p. 1058).

Still, there is no reason to suspect that an inflated association between combat trauma and PTSD was any greater than that between the other most upsetting traumas and PTSD. The present study provides an examination of the *relative* influence of the worst traumas on PTSD and other outcomes. It is not intended to be an epidemiologic study of the prevalence rates of adverse outcomes associated with typical traumatic exposures in the general population. Rather, it is a study designed to *compare* the negative consequences among the most disturbing traumas to determine how those who have been most upset by combat exposure fare relative to men whose most upsetting life experience was another type of event.

As a further consideration, we acknowledge that community-based surveys such as the NCS cannot adequately account for the effects of treatment. The NCS provided little information on the type or duration of treatment ever received for any emotional disorder occurring in the respondent's lifetime. Bremner et.al. (1996) have reported no significant effect of treatment on the course of PTSD in their sample of veteran patients being treated for combat-related PTSD. Similarly, Kessler et al. (1995), in addition to noting a potential error in recall of symptom duration associated with treatment, found that over one-third of those who met criteria for PTSD never fully remitted regardless of whether they received some form of treatment. In recognition of the problems inherent in evaluating the impact of non-uniformly administered treatment in a cross-sectional survey, and the marginal efficacy of treatment noted above, the effects of treatment were not factored into our models. Future research will need to determine whether the response of PTSD to particular treatments varies significantly according to trauma type.

In contrast with studies like the National Vietnam Veterans Readjustment Study (Kulka et al., 1990) that was designed to examine the long-term functioning of veterans after war exposure, NCS respondents were not encouraged to elaborate upon their war experiences. Thus, the results indicating that

combat trauma, when nominated as the most upsetting lifetime experience, ranks highest in both absolute and relative terms with respect to risk of PTSD, unemployment, being fired, divorce, and being physically abusive to one's spouse appear particularly impressive. Nevertheless, these findings will need to be replicated in prospective, longitudinal studies that provide more information about the traumatic exposure, which permit an examination of the potential influence of treatment, and which allow for greater precision in the causal connections that may be drawn between traumatic events and the incidence and course of PTSD and related disabilities.

References

Beckham JC, Feldman ME, Kirby AC (1998) Atrocities exposure in Vietnam combat veterans with chronic posttraumatic stress disorder: Relationship to combat exposure, symptom severity, guilt and interpersonal violence. *J Traumatic Stress* 11:777–785.

Bremner JD, Southwick SM, Brett E, Fontana A, Rosenheck R, Charney DS (1992) Dissociation and posttraumatic stress disorder in Vietnam combat veterans. *Am J Psychiatry* 149:328b–333b.

Bremner JD, Southwick SM, Darnell A, Charney DS (1996) Chronic PTSD in Vietnam combat veterans: Course of illness and substance abuse. *Am J Psychiatry* 153:369–375.

Breslau N, Davis GC, Andreski P, Peterson E (1991) Traumatic events and posttraumatic stress disorder in an urban population of young adults. *Arch Gen Psychiatry* 48:216–222.

Breslau N, Davis GC (1987) Posttraumatic Stress Disorder: The etiologic specificity of wartime stressors. *Am J Psychiatry* 144:578–583.

Breslau N, Kessler RC, Chilcoat HD, Schultz LR, Davis GC, Andreski P (1998) Trauma and Posttraumatic Stress Disorder in the Community: The 1996 Detroit Area Survey of Trauma. *Arch Gen Psychiatry* 55:626–632.

Byrne CA, Riggs DS (1996) The cycle of trauma: Relationship aggression in male Vietnam veterans with symptoms of posttraumatic stress disorder. *Violence & Victims* 11:213–225.

Davidson JR, Hughes D, Blazer DG, George LK (1991) Posttraumatic stress disorder in the community: An epidemiological study. *Psychol Med* 21:713–721.

Engel CC, Ursano R, Magruder C, Tartaglione R, Jing Z, Labbate LA, Debakey S (1999) Psychological conditions diagnosed among veterans seeking Department of Defense Care for Gulf-War-related health concerns. *J Occup Environ Med* 4:384–392.

Fontana A, Rosenheck R (1994) Posttraumatic stress disorder among Vietnam theater veterans: A causal model of etiology in a community sample. *J Nerv Ment Dis* 182:677–684.

Foy DW, Sipprelle RC, Rueger DB, Carroll EM (1984) Etiology of Posttraumatic Stress Disorder in Vietnam veterans: Analysis of premilitary, military, and combat exposure influences. *J Consult Clin Psychol* 52:79–87.

Green BL, Grace MC, Lindy JD, Gleser GC (1990) War stressors and symptom persistence in posttraumatic stress disorder. *J Anxiety Disord* 4:31–39.

Helzer JE, Robins LN, McEvoy L (1987) Post-traumatic stress disorder in the general population: Findings of the epidemiologic catchment area survey. *N Engl J Med* 317:1630–1634.

Jordan BK, Schlenger WE, Hough R, Kulka RA, Weiss D, Fairbank JA, Marmar CF (1991) Lifetime and current prevalence of specific psychiatric disorders among Vietnam veterans and controls. *Arch Gen Psychiatry* 48:207–215.

Kessler RC, McGonagle KA, Zhao S, Nelson CB, Hughes M, Eshleman S, Wittchen H-U, Kendler KS (1994) Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States: Results from the National Comorbidity Survey. *Arch Gen Psychiatry* 51:8–19.

Kessler RC, Sonnega A, Bromet E, Hughes M, Nelson CB (1995) Posttraumatic Stress Disorder in the National Comorbidity Survey. *Arch Gen Psychiatry* 52:1048–1060.

Kilpatrick DG, Resnick HS (1992) Posttraumatic stress disorder associated with exposure to criminal victimization in clinical and community populations. In JRT Davidson, EB Foa (Eds), *Posttraumatic Stress Disorder: DSM-IV and Beyond* (pp 113–143) Washington, DC: American Psychiatric Press.

Kluznik, JC, Speed N, Van Valkenburg C, Magraw R (1986) Forty-year follow-up of United States prisoners of war. *Am J Psychiatry* 143:1443–1446.

Kolb LC, Mutalipassi LR (1982) The conditioned emotional response: A sub-class of the chronic and delayed post-traumatic stress disorder. *Psychiatr Ann* 12:979–987.

Kulka R, Schlenger W, Fairbank J, Hough R, Jordan BK, Marmar C, Weiss D (1990) *Trauma and the Vietnam War Generation.* New York: Brunner/Mazel.

March JS (1992) What constitutes a stressor? The 'criterion A' issue. In JRT Davidson, EB Foa (Eds), *Posttraumatic Stress Disorder: DSM-IV and Beyond* (pp 37–54) Washington, DC: American Psychiatric Press.

Marmar CR, Weiss DS, Schlenger WE, Fairbank JA, Jordan K, Kulka RA, Hough RL (1994) Peritraumatic dissociation and post-traumatic stress in male Vietnam theater veterans. *Am J Psychiatry* 151:902–907.

McFarlane AC (1988) The longitudinal course of posttraumatic morbidity: The range of outcomes and their predictors. *J Nerv Ment Dis* 176:30–39.

Mellman TA, Randolph CA, Brawman-Mintzer O, Flores LP, Milanes FJ (1992) Phenomenology and course of psychiatric disorders associated with combat-related posttraumatic stress disorder. *Am J Psychiatry* 149:1568–1574.

Pomerantz AS (1991) Delayed onset of PTSD: Delayed recognition or latent disorder? *Am J Psychiatry* 148:1609.

Robins LN, Wing J, Wittchen H-U, Helzer JE (1988) The Composite International Diagnostic Interview: An epidemiologic instrument suitable for use in conjunction with different diagnostic systems and in different cultures. *Arch Gen Psychiatry* 45:1069–1077.

Sierles FS, Chen J-J, McFarland RE, Taylor MA (1983) Posttraumatic stress disorder and concurrent psychiatric illness: A preliminary report. *Am J Psychiatry* 140:1177–1179.

Solomon Z, Kotler M, Shalev A, Lin R (1989) Delayed onset PTSD among Israeli veterans of the 1982 Lebanon War. *Psychiatry* 52:428–436.

Southwick SM, Morgan CA, Nicolaou AL, Charney DS (1997) Consistency of memory for combat-related traumatic events in veterans of Operation Desert Storm. *Am J Psychiatry* 154: 173–177.

SAS Institute (1996) SAS 6.12. Cary, NC: SAS Institute Inc.

True WR, Goldberg J, Eisen SA (1988) Stress symptomatology among Vietnam veterans: Analysis of the Veterans Administration survey of veterans, II. *Am J Epidemiol* 177:154–159.

U.S. Department of Health and Human Services (1992) National Health Interview Survey, 1989. Hyattsville, MD: National Center for Health Statistics. Computer file.

Wittchen H-U (1994) Reliability and validity studies of the WHO-Composite International Diagnostic Interview (CIDI): A critical review. *J Psychiatr Res* 28:57–84.

World Health Organization (1990a) Composite International Diagnostic Interview. Version 1.0. Geneva, Switzerland: World Health Organization.

World Health Organization (1990b) Composite International Diagnostic Interview Computer Programs. Version 1.1. Geneva, Switzerland: World Health Organization.

Zlotnick C, Warshaw M, Shea MT, Allsworth J, Pearlstein T, Keller MB (1999) Chronicity in posttraumatic stress disorder (PTSD) and predictors of course of comorbid PTSD in patients with anxiety disorders. *J Traumatic Stress* 12:89–100.