



Risk Factors for DSM-III-R Posttraumatic Stress Disorder: Findings from the National Comorbidity Survey

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The present study examined the association of childhood risk factors with exposure to traumas and posttraumatic stress disorder (PTSD). PTSD is a unique symptom configuration after exposure to an unusual, extreme event. Data come from the US National Comorbidity Study of 5,877 respondents aged 15–54 years conducted between September 1990 and February 1992. The risk factors examined were preexposure affective, anxiety, and substance use disorders; parental mental and substance use disorders; parental aggression toward the respondent and toward the other parent; and a nonconfiding relationship with the mother during childhood. Analyses were stratified by gender and adjusted for demographic variables and traumatic experiences prior to the index trauma. The occurrence of trauma was associated with many risk factors in women but few in men. Similarly, more risk factors predicted PTSD in women than in men. Overall, when respondents were grouped into broad trauma categories, an increase in the number of risk factors was associated with higher rates of PTSD. However, in analyses of the trauma subsample that adjusted for individual type of trauma (e.g., rape, physical attack), only one risk factor (history of affective disorder) predicted PTSD in women, and two (history of anxiety disorder and parental mental disorder) predicted PTSD in men. The results thus indicate that although these risk factors have an important association with PTSD, they operate largely by predicting trauma exposure rather than by predicting the onset of disorder after exposure. *Am J Epidemiol* 1998;147:353–61.

affective disorders; aggression; anxiety disorders; mental disorders; stress disorders, post-traumatic; substance use disorder; trauma

Posttraumatic stress disorder (PTSD) entails a unique set of symptoms after exposure to a traumatic event that is outside the “range of usual human experience” (*Diagnostic and Statistical Manual of Mental Disorders, Third Edition-Revised (DSM-III-R)*) (1, p. 250). The clinical response includes symptoms lasting at least 1 month that are associated with reliving the traumatic experience, avoidance of stimuli associated with the trauma or psychic numbing, and hyperarousal and physiologic reactivity to events resembling the trauma. Recent epidemiologic studies of PTSD defined under DSM-III-R (1) report lifetime prevalence

rates ranging from 7.8 percent in the National Comorbidity Survey (NCS) (2), to 9.2 percent in young adult Health Maintenance Organization enrollees (3), to 12.3 percent in a national telephone survey of women (4). The variability in rates is attributable to differences in assessment procedures, age and gender distributions of the samples, and the types of traumatic experiences to which the populations were exposed. The latter issue is especially important. Although, on average, 25 percent of individuals who experience a traumatic event will develop PTSD (5), the rates are considerably higher for life-threatening events than for those that are of lower impact. In the NCS, the rate of PTSD was 65.0 percent among women who reported rape as their most upsetting event compared with 3.7 percent for natural disasters (2).

Besides the type of event, the most consistently reported risk factors for PTSD are female gender, preexisting psychiatric disorders, childhood adversities, social disadvantage (e.g., poverty), and genetic predisposition (family history of psychopathology and/or substance abuse) (5, 6). However, except for reports from two Epidemiologic Catchment Area sites based on DSM-III (7, 8), the findings on risk factors

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Abbreviations: CI, confidence interval; DSM-III-R, *Diagnostic and Statistical Manual of Mental Disorders, Third Edition Revised*; NCS, National Comorbidity Survey; OR, odds ratio; PTSD, posttraumatic stress disorder.

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come mainly from research on veterans (9) or from samples with a restricted age range (3) or disaster-related PTSD (10).

To our knowledge, the NCS is the only face-to-face epidemiologic study that permits an examination of a range of risk factors in a nationally representative sample of adults in the early and middle years of life. In this paper, we examine nine psychosocial risk factors for PTSD. Because of the recognized scarcity of epidemiologic data on traumatic events and PTSD (11), our focus on psychosocial risk factors is conceptualized as a first step in the development of a multifactorial model predicting the occurrence of this complex and often chronic disorder. The nine risk factors are preexposure affective, anxiety, and substance use disorders; parental history of mental and substance use disorders; and four indicators of childhood social adversity, namely, parental aggression toward the respondent, aggression between parents, lack of a confiding relationship with the mother, and parental separation or divorce. Findings are presented separately for men and women because of the widely reported gender differences in types of traumatic exposures and rates of PTSD (12). The paper examines separately whether these risk factors predict exposure to trauma and the conditional probability of developing PTSD once exposed to a trauma.

MATERIALS AND METHODS

Sample

The NCS was conducted between September 1990 and February 1992 to determine the distribution, correlates, and consequences of psychiatric disorders in the United States. Details about the design and methods are presented elsewhere (13). Briefly, the survey was based on a stratified, multistage area probability sample aged 15–54 years in the noninstitutionalized, civilian population of the 48 conterminous states, including a supplemental sample of students living in campus group housing. The final response rate was 82.4 percent. A special nonresponse survey was performed to ascertain and statistically adjust for nonresponse bias.

The NCS interview was composed of two parts. Part 1, administered to 8,098 respondents, included the core diagnostic interview (a modified version of the Composite International Diagnostic Interview) (14), a brief risk factor battery, and sociodemographic information (13). Part 2 contained a more detailed assessment of risk factors and ancillary diagnoses, including PTSD. Because of budgetary constraints, part 2 was administered to a subsample of 5,877 respondents, including respondents aged 15–24 years (99.4 percent

of whom completed part 2), all others who screened positive for any lifetime diagnosis (98.1 percent of whom completed part 2), and a random subsample of other respondents (99 percent of whom completed part 2).

Measures

For a diagnosis of PTSD, as noted above, the DSM-III-R requires 1) exposure to a traumatic event “outside the range of usual human experience” (1, p. 250); 2) at least one symptom associated with persistently reexperiencing the event, e.g., intrusive or recurrent distressing recollections, recurrent distressing dreams, sudden feelings that the event was recurring (including flashbacks), and intense psychologic distress at exposure to things that symbolize or resemble the event; 3) at least three symptoms indicative of persistent avoidance of trauma-related stimuli or psychic numbing; and 4) two or more symptoms of hyperarousal (e.g., sleep difficulty, irritability, hypervigilance). Symptoms must persist for at least 1 month to qualify for a diagnosis. In the NCS, the revised Diagnostic Interview Schedule’s PTSD module (3) was used with the following modifications. First, we developed a list of 12 questions (figure 1) in an effort to focus memory search. The first 11 questions were about specific traumatic events, while the twelfth was an open-ended question subsequently coded as either qualifying under the exposure criterion (e.g., discovering a dead body) or not (e.g., divorce). Second, to maximize disclosure of potentially embarrassing or stigmatizing events, the list was presented in a booklet, and interviewers asked about each experience by number rather than by name. Third, the symptom criteria were evaluated for one event per respondent because of time and budget constraints. Respondents who named multiple traumas were asked to nominate their “most upsetting” event for purposes of this evaluation. In this paper, we refer to the trauma for which PTSD was evaluated as the “index trauma.” A comparison of NCS diagnoses with a diagnostic reinterview of a subsample of 29 respondents yielded an estimated kappa of 0.75 (standard error = 0.11), a positive predictive value of 1.0, and a negative predictive value of 0.88.

From the modified Composite International Diagnostic Interview administered during part 1 (13), information on affective disorder (major depressive disorder, dysthymia, and mania), anxiety disorder (generalized anxiety disorder, panic disorder, simple phobia, social phobia, and agoraphobia), and substance use disorder (alcohol or drug use) was elicited. A series of variables was constructed, indicating whether the age of onset of each disorder occurred before the index trauma.

Did any of these events ever happen to you?

1.	You had direct combat experience in a war.
2.	You were involved in a life-threatening accident.
3.	You were involved in a fire, flood, or natural disaster.
4.	You witnessed someone being badly injured or killed.
5.	You were raped. (Someone had sexual intercourse with you when you did not want to by threatening you or using some degree of force.)
6.	You were sexually molested. (Someone touched or felt your genitals when you did not want them to.)
7.	You were seriously physically attacked or assaulted.
8.	You were threatened with a weapon, held captive, or kidnapped.
9.	You were physically abused as a child.
10.	You were seriously neglected as a child.
11.	You suffered a great shock because one of the events on this list happened to someone close to you.
12.	Have you ever had any other terrible experience that most people never go through?

FIGURE 1. List of events presented to NCS respondents interviewed in 1990–1992, US national sample.

Measures of parental psychopathology and substance use disorders were based on separate assessments about respondents' mothers and fathers regarding depression, generalized anxiety disorder, alcohol or drug abuse, and antisocial personality disorder when the respondent was a child. These were assessed by the Family History Research Diagnostic Criteria Interview (15), except for generalized anxiety disorder, which was measured by a similar, previously validated instrument (16).

A modification of the Conflict Tactics Scales (17) was administered to evaluate the extent to which family members exhibited verbal or physical aggression toward respondents when they were growing up. To encourage disclosure, respondents were asked to look at three lists (A-C) of behaviors and to indicate on a four-point scale (1 = never; 4 = often) how often someone in their household exhibited any of those behaviors toward them. Household members included parents, stepparents, siblings, and anyone else living with the family. List A was composed of verbal behaviors and threats of physical aggression (insulted or swore; sulked or refused to talk; did or said something to spite; threatened to hit; smashed or kicked something in anger). List B assessed mild physical aggression (pushed, grabbed, or shoved; threw something; slapped or spanked). List C assessed severe physical aggression (kicked, bit, or hit with a fist; hit or tried to

hit with something; beat up; choked; burned or scalded). For each list and each person mentioned, a variable was created with a 1–4 range. A standardized summed score was then created (Cronbach's alpha (α) = 0.78), and a cutpoint of one standard deviation above the mean was used to indicate a high degree of familial aggression toward the respondent.

A modified Conflict Tactics Scale was used to assess aggression between the respondent's parents. Respondents were given the same three lists of behaviors and asked how often their parents (or the people who raised them) exhibited any of those behaviors toward each other. As above, a summary variable was constructed (α = 0.72), and a cutoff of one standard deviation above the mean was used to indicate a high degree of aggression between parents.

To determine the quality of the relationship between respondents and their mothers during childhood, respondents were asked two questions rated on a four-point scale (1 = not at all; 4 = a lot) about their natural mother or the woman who spent the most time raising them: 1) "How much did she understand your problems and worries?" 2) "How much could you confide in her about things that were bothering you?" These items were summed and standardized (α = 0.78), and a cutoff of one standard deviation below the mean was used to indicate a nonconfiding relationship with the mother.

Parental separation and parental divorce were also determined. On the basis of the respondent's age at first such occurrence, a variable was created to indicate if the respondents' parents were separated for more than 6 months or divorced during their childhoods (birth to age 11 years).

Statistical analyses

The weighting procedures used for the NCS analysis have been described elsewhere (13). Briefly, because of the complex sample design, estimates of standard errors of means were obtained using the Taylor series linearization method (18). The PSRATIO program in the OSIRIS software package (19) was used to make these calculations. Estimates of standard errors of logistic regression coefficients were obtained by using the method of Balanced Repeated Replication (20, 21) in 44 design-based subsamples. The LOGISTIC program in the SAS software package version 6.03 (22) was used to estimate the parameters in each replicate, and an SAS macro was used to calculate the balanced repeated replication estimates of the variances of these parameter estimates across replicates.

Two of the eleven types of traumatic experiences on the NCS list, being physically abused as a child and being seriously neglected as a child, have been conceptualized as precursors of PTSD (23). Because such early victimization experiences overlap conceptually with the risk factors under investigation here, we present a separate comparison of respondents who reported these events as their "worst" or only trauma with the remainder of the sample.

We estimated logistic regression models to predict report of the index trauma and diagnosis of PTSD for women and men. In the analyses predicting PTSD and predicting trauma in the full sample, we converted a person-level data file into a person-year file. In this file, separate observational records were created for each year of a person's life, up to and including the year of the outcome. In predicting PTSD, a dichotomous outcome variable was created to discriminate the year of PTSD onset (coded 1) from years prior to PTSD onset (coded 0). In the analyses predicting trauma, a dichotomous outcome variable was created to discriminate the year of the index trauma (coded 1) from years prior to this trauma (coded 0). The logits from these analyses can be interpreted as discrete-time survival coefficients (24). These discrete-time analyses controlled for age (interval or person-year), cohort (age at interview), time-varying measures of marital status (currently married or previously married with never married as the referent) and educational status (years of education, whether or not the respondent was a student, and an interaction of these two variables),

and a dichotomous variable to indicate whether the respondent reported two or more previous traumas (versus the omitted category of none or one). The demographic variables were included because previous findings support the statistical importance of these variables as predictors of PTSD. Since PTSD was assessed for only one trauma, experience of previous trauma was used for adjustment purposes but cannot be regarded as a separate risk factor.

We next tested the effects of the risk factors among those exposed to the index trauma. Adjusted odds ratios were obtained from multivariate logistic regression (person-level), where the odds ratio represents an exponentiated logit. We estimated separate logistic regression models for women and men with and without controlling for type of trauma. In the latter analyses, separate dummy variables were created for each trauma, with natural disaster serving as the referent. These analyses also controlled for the same demographic variables as in earlier analyses.

RESULTS

Factors associated with neglect and abuse

Because of the conceptual overlap between childhood neglect and abuse and the putative risk factors, we compared the 84 women and 62 men who nominated these traumas as their index experience with the remainder of the sample. We found no significant differences in race, educational attainment, or parental socioeconomic status for either sex. However, women and men who cited neglect or physical abuse were significantly more likely than others to report a family history of mental and substance use disorders, aggression between parents, a nonconfiding relationship with the mother, and early parental separation or divorce. In addition, these women were significantly more likely than others in the study to report a personal psychiatric history and aggression between parents, while men were less likely than others in the study to report a substance abuse history. These 146 respondents were excluded from all subsequent analyses.

The remaining analyses were based on 2,981 women and 2,750 men. The lifetime prevalences of PTSD in the women and men were 10.1 and 4.9 percent, respectively. The rates of PTSD among women and men exposed to trauma were 19.4 and 7.6 percent, respectively.

Risk factors for exposure to trauma and PTSD

Separate logistic regression analyses for women and men, with all risk variables entered simultaneously, were carried out to describe the associations of the risk factors with exposure to trauma and PTSD, adjusting

for demographic characteristics and previous traumas (table 1). We note that the intercorrelations among the risk factors for both sexes were modest in size (range, 0.04–0.34). Among women, preexposure episodes of affective and anxiety disorders, parental history of mental illness, parental aggression toward the respondent, and a nonconfiding relationship with the mother were significant predictors of PTSD. Among the control variables, only younger age and prior trauma exposure were significant predictors. With regard to exposure to trauma among women, six risk factors were statistically significant, namely, preexposure affective, anxiety, and substance abuse disorders; parental mental illness and substance abuse; and parental aggression toward the respondent. Significant control variables were younger age, being married at the time of the trauma, having been married previously, and years of education.

Among men, the three risk factors that significantly predicted PTSD were affective and anxiety disorders and parental mental disorder. The only demographic variables that were significantly related to PTSD were being married at the time of the index trauma and having fewer years of schooling. Three risk factors were significant predictors of exposure to the index trauma—preexposure history of anxiety disorder, parental substance abuse history, and parental divorce. In addition, the majority of the control variables were significant predictors of trauma exposure in the expected direction.

Table 2 focuses on NCS respondents who reported trauma exposure and presents the relations of the risk factors to PTSD before (left odds ratio columns for both women and men) and after (right odds ratio columns) controlling for type of trauma. Without controlling for trauma type, three risk factors were signif-

TABLE 1. Adjusted odds ratios for PTSD* and exposure to trauma among National Comorbidity Survey respondents, by sex, United States national sample, 1990–1992

Risk factors	Women (n = 2,981)				Men (n = 2,750)			
	Risk of PTSD		Risk of trauma		Risk of PTSD		Risk of trauma	
	OR*,†	95% CI*	OR	95% CI	OR	95% CI	OR	95% CI
Prior psychiatric disorders								
Affective	3.03	2.17–4.23	1.60	1.28–2.00	4.54	2.13–9.68	1.30	0.99–1.89
Anxiety	1.56	1.09–2.24	1.23	1.04–1.44	2.22	1.27–3.89	1.18	1.01–1.38
Substance use	1.33	0.89–1.98	1.46	1.20–1.77	1.61	0.88–2.96	1.75	1.44–2.13
Parental psychiatric disorders								
Mental	1.92	1.14–3.24	1.28	1.06–1.56	1.92	1.14–3.23	1.20	0.95–1.50
Substance use	1.43	0.87–2.35	1.26	1.05–1.52	0.94	0.44–2.01	0.99	0.78–1.25
Childhood family stress								
Parental aggression toward respondent	1.82	1.05–3.15	1.52	1.14–2.07	2.14	0.95–4.81	1.13	0.87–1.46
Aggression between parents	0.99	0.63–1.54	1.07	0.87–1.31	1.22	0.54–2.74	1.22	0.86–1.74
Nonconfiding relationship with mother	1.45	1.00–2.10	1.20	0.94–1.52	1.63	0.40–6.85	0.95	0.61–1.47
Parental divorce	1.26	0.80–1.98	1.20	0.95–1.51	1.60	0.60–4.26	1.30	1.04–1.61
Background characteristics								
Age (years)								
15–24	2.30	1.02–5.14	3.18	2.05–4.89	1.01	0.31–3.27	3.32	2.07–5.31
25–34	1.45	0.85–2.48	1.78	1.25–2.52	0.74	0.32–1.69	1.62	1.16–2.26
35–44	1.27	0.65–2.46	1.42	1.05–1.91	0.71	0.28–1.79	1.64	0.91–1.87
45–54	1.00	—‡	1.00	—	1.00	—	1.00	—
Marital status								
Married	1.45	0.84–2.61	2.32	1.88–2.85	1.86	1.01–3.35	1.83	1.47–2.26
Previously married	1.05	0.43–2.54	1.62	1.86–2.07	0.89	0.23–3.50	1.15	0.96–1.38
Never married	1.00	—	1.00	—	1.00	—	1.00	—
Years of education	1.04	0.98–1.09	1.05	1.00–1.09	1.11	1.01–1.22	1.14	1.09–1.18
Education status								
Student	0.60	0.19–1.85	0.95	0.60–1.51	0.11	0.00–0.53	0.68	0.39–1.15
Not a student	1.00	—	1.00	—	1.00	—	1.00	—
Years of education x student	1.08	0.98–1.20	1.03	0.98–1.08	1.19	0.86–1.63	1.07	1.03–1.12
Previous trauma exposure								
0–1	1.00	—	1.00	—	1.00	—	1.00	—
≥2	2.89	1.47–5.68	1.06	0.68–1.64	1.88	0.90–3.93	1.41	1.11–1.78

* PTSD, posttraumatic stress disorder; OR, odds ratio; CI, confidence interval.

† Odds ratios are exponentiated logits from a discrete-time model.

‡ —, reference group.

TABLE 2. Adjusted odds ratios for PTSD* among National Comorbidity Survey respondents exposed to a trauma with and without controlling for trauma type, by sex, United States national sample, 1990–1992

Risk factors	Women exposed to trauma (n = 1,488)				Men exposed to trauma (n = 1,645)			
	Risk of PTSD		Risk of PTSD controlling for trauma type		Risk of PTSD		Risk of PTSD controlling for trauma type	
	OR*,†	95% CI*	OR	95% CI	OR	95% CI	OR	95% CI
Prior psychiatric disorders								
Affective	1.70	1.04–2.77	1.84	1.02–3.32	3.08	1.21–7.91	2.26	0.89–5.75
Anxiety	1.35	0.83–2.22	1.25	0.72–2.17	1.88	0.96–3.57	2.42	1.19–4.94
Substance use	1.27	0.80–2.04	1.24	0.75–2.03	1.24	0.59–2.61	1.35	0.60–3.05
Parental psychiatric disorders								
Mental	2.01	1.13–3.58	1.88	0.96–4.05	1.90	1.08–3.33	1.96	1.18–3.30
Substance use	1.34	0.76–2.39	1.43	0.78–2.61	0.98	0.43–2.22	1.55	0.68–3.64
Childhood family stress								
Parental aggression toward respondent	1.59	0.91–2.77	1.17	0.57–2.42	2.06	0.86–4.90	2.29	0.91–5.79
Aggression between parents	0.93	0.55–1.56	1.04	0.57–1.88	0.94	0.37–2.34	0.69	0.26–1.64
Nonconfiding relationship with mother	1.71	1.07–2.73	1.36	0.78–2.32	1.83	0.31–11.97	2.70	0.54–13.51
Parental divorce	1.19	0.72–1.99	1.09	0.64–1.87	1.43	0.49–4.15	1.41	0.58–3.43
Background characteristics								
Age (years)								
15–24	1.21	0.56–2.62	1.44	0.69–3.02	0.35	0.13–0.96	1.11	0.32–3.87
25–34	1.18	0.70–2.00	1.34	0.74–2.41	0.59	0.28–1.26	1.34	0.52–3.43
35–44	1.17	0.58–2.35	1.20	0.54–2.67	0.73	0.25–2.12	0.78	0.26–2.33
45–54	1.00	—‡	1.00	—	1.00	—	1.00	—
Marital status								
Married	1.12	0.55–2.27	1.79	0.81–3.94	0.99	0.52–1.88	1.34	0.71–2.54
Previously married	0.97	0.43–2.21	0.83	0.33–2.09	0.70	0.12–4.17	0.95	0.21–4.40
Never married	1.00	—	1.00	—	1.00	—	1.00	—
Years of education	0.91	0.85–0.97	0.90	0.83–0.97	0.89	0.83–0.97	0.90	0.81–1.00
Education status								
Student	0.96	0.09–10.34	0.54	0.04–7.75	0.01	0.00–0.32	0.06	0.00–3.13
Not a student	1.00	—	1.00	—	1.00	—	1.00	—
Years of education × student	1.00	0.83–1.21	1.04	0.84–1.28	1.39	1.07–1.80	1.20	0.87–1.68
Previous trauma exposure								
0–1	1.00	—	1.00	—	1.00	—	1.00	—
≥2	5.65	2.66–11.99	5.64	2.15–14.79	1.67	0.65–4.25	1.53	0.46–5.10

* PTSD, posttraumatic stress disorder; OR, odds ratio; CI, confidence interval.

† Odds ratios are exponentiated logits from a discrete-time model.

‡ —, reference group.

icant predictors of PTSD in the exposed women—preexposure affective disorder, parental mental history, and a nonconfiding relationship with the mother. Experiencing other traumatic events before the index trauma was also significant. Among men, without controlling for trauma type, only two risk factors were significant—preexposure affective disorder and parental mental history.

When type of trauma was added, only preexposure affective disorder remained a significant predictor among women (although the coefficient for parental mental disorder changed only slightly). The traumas that had significant associations were physical attack, rape, molestation, other qualifying trauma, and being threatened with a weapon. Among men, preexposure anxiety disorder and parental mental disorder were the only significant risk factors after controlling for type of trauma. The traumas that were significantly associ-

ated with PTSD were sex trauma (rape or molestation), war, and the “other” qualifying trauma.

Number of risk factors

Finally, we created a four-level variable based on the total number of risk factors (0, 1, 2, and ≥3). We then grouped the index traumas into broad categories: sex traumas (rape or molestation; $n = 439$ females and 33 males); other physical traumas (physical attack, threatened with a weapon, kidnapped; $n = 164$ females and 288 males); and other traumas (accident, fire, witness, shock, and other qualifying trauma; $n = 883$ females and 1,221 males). Men had an additional category for war-related traumas ($n = 103$). In all cases, the greater the number of risk factors, the higher the rate of PTSD. For example, in women exposed to sex traumas, the rates of PTSD were: no risk factor,

11.7 percent; one risk factor, 29.4 percent; two risk factors, 41.6 percent; and three or more risk factors, 50.3 percent. The odds ratios and 95 percent confidence intervals, with no risk factor serving as the reference for comparison, were: one risk factor, odds ratio (OR) = 3.13, 95 percent confidence interval (CI) 0.62–15.86; two risk factors, OR = 5.36, 95 percent CI 1.18–24.32; three or more risk factors, OR = 7.63, 95 percent CI 1.67–34.84. Although the numbers were small, men exposed to a sex trauma had similar rates of PTSD (no risk factor, 5.1 percent; one risk factor, 31.9 percent; two risk factors, 37.5 percent; three or more risk factors, 49.5 percent). To test the significance of the trends indicating a progressive association between the number of risk factors and rate of PTSD, we estimated a series of logistic regression models. The trend was statistically significant for sex traumas (OR = 1.79, 95 percent CI 1.34–2.40) and other traumas (OR = 1.67, 95 percent CI 1.28–2.17) among women and for other traumas (OR = 2.00, 95 percent CI 1.53–2.61) and war (OR = 3.54, 95 percent CI 1.53–8.15) among men.

DISCUSSION

The major focus of this study was on the identification of risk factors that increased vulnerability to exposure to traumas and to the development of PTSD. The findings are based on retrospective reports about trauma, PTSD, and childhood vulnerability factors. As Breslau et al. (25) note, data of this sort are potentially subject to recall bias, and the causal relations among the variables cannot be definitively disentangled. Nevertheless, our findings are consistent with previous studies of PTSD in community samples in finding that early signs of personal and familial dysfunction and genetic predisposition are associated with increased chances of trauma exposure and, once exposed, of developing PTSD (5). However, when we examined the exposure subgroup and took the additional step of controlling for the types of trauma they reported, very few of the risk factors significantly predicted the occurrence of PTSD, suggesting that type of trauma overrides the importance of these risk factors among both women and men.

The risk factors investigated here are indisputably important for psychiatric disorder in general, not just for PTSD per se. Lifetime PTSD is often comorbid with other mental and substance use disorders (26), and major life stressors are known to increase the risk of depressive and anxiety disorders (27). On an individual level and in analyses that considered the number of previous traumas but not the type of trauma for which PTSD was assessed, the risk factors we investigated were important and significant predictors of

PTSD. Moreover, all of the relations were in the predicted direction, namely, that the presence of the vulnerability factor increased the likelihood of exposure and of PTSD onset. The fact that only a small number of risk factors remained significant after trauma type was controlled could be because certain types of events, such as rape and combat, are so severe that preexisting vulnerability characteristics are overshadowed as predictors of onset of disorder. For example, although Green (5) estimated that PTSD occurs, on average, to 25 percent of individuals exposed to traumatic events, we previously reported that 65 percent of men and 46 percent of women who reported rape as their only or most upsetting trauma met criteria for PTSD (2). In addition, 39 percent of men for whom combat was their only or most upsetting experience and 33 percent of women who were threatened with a weapon also met criteria for PTSD (2). On the other hand, the fact that certain risk factors, especially pre-exposure affective disorder in women and pre-exposure anxiety disorder and parental history of mental disorder in men, were significantly associated with exposure to trauma and remained statistically significant after controlling for type of trauma supports the fundamental importance of these variables. In addition, within broad trauma groupings, the rate of PTSD increased progressively with the total number of risk factors.

Another formulation that is consistent with the pattern of our findings is attachment theory. As noted by Henderson et al. (27), adversity in the childhood environment is often associated with inadequate development of bonds with parents. In turn, this disruption in normal attachment can profoundly alter adult mental health, specifically by increasing vulnerability to stress, rates of mood disorders, and perhaps PTSD after exposure to extreme events.

Our findings on the significance for women of a nonconfiding relationship with their mother mirror prospective findings on the importance of a trusting and confiding relationship in childhood for adult mental health (28). In addition, the 40-year follow-up data from the Lundby study (29) showed that several indicators of a positive childhood family environment, including "trusting relationships with a parent," were associated with symptomatology.

Our measures of parental psychopathology and substance abuse probably underestimated the true rate of psychopathology among family members, since they were not assessed directly. Nevertheless, these indicators were important predictors of exposure to trauma and of PTSD onset. While we have conceptualized them as "genetic" risk factors, it is equally likely that they reflect environmental adversities in the early lives

of these respondents. Moreover, as Garmezy and Rutter (30) noted, this array of chronic environmental adversities is undoubtedly greater than the sum of its parts.

Breslau et al. commented that their ability "to predict PTSD among those who were exposed was greater than [their] ability to predict exposure to traumatic events" (3, p. 222). We found a different pattern, especially for men. That is, there were many more significant risk factors associated with exposure to trauma (table 1) compared with the onset of PTSD in the trauma subsamples. There are a number of methodological and analytic differences between the study by Breslau et al. and ours, making it difficult to draw inferences about the somewhat different results across the two studies. For example, Breslau et al. did not present findings separately by gender (a major risk factor for PTSD (2, 5)) or control for trauma type when examining predictors of PTSD.

As expected, respondents who reported childhood abuse or neglect also acknowledged other childhood adversities, such as parental aggression and divorce. Vandeven and Newberger (31) commented that abused children usually come from families with a constellation of social and emotional deviancy. Thus, the specific effects of abuse and neglect cannot be disentangled from other familial adversities. While evidence is accumulating that abuse and neglect in childhood are predictive of subsequent antisocial personality disorder (32), teen pregnancy and drug use (31), depressive symptoms (33), and poor mental health generally (30), our findings suggest that abuse and neglect are also risk factors for PTSD, with 38.6 percent of abused women and 22.6 percent of abused men meeting diagnostic criteria.

Our conclusions must be tempered by the methodological limitations of our study and of the diagnosis of PTSD. With respect to our study, we only assessed PTSD for a single trauma. Therefore, we probably underestimated the true rate of PTSD and may also have underestimated the effects of the risk factors we evaluated. As a disorder, PTSD is highly comorbid with many other psychiatric disorders, including substance abuse, depression, and anxiety disorders (6). In some samples, the overlap exceeds 80 percent. In our analysis, respondents could have developed other new lifetime disorders after the index trauma. Thus, while in theory, one would propose to disentangle pure PTSD from comorbid PTSD, in reality, PTSD rarely occurs in the absence of other conditions. In the full NCS sample, only 21 percent of women with PTSD and 12 percent of men with PTSD had no other disorder (2). Thus, the risk factors identified here and in previous studies are not unique to PTSD. Neverthe-

less, our results reinforce the finding that PTSD is not randomly distributed throughout the population. The fact that the data were gathered from a national probability sample with a wide age range underscores the importance of the present findings.

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