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Assaultive violence and the risk of posttraumatic stress disorder following a subsequent trauma

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Abstract

Breslau, Peterson, and Shultz (2008) reported that prior trauma alone, in the absence of PTSD, did not predict an increased PTSD risk, relative to no prior trauma. Only prior trauma that resulted in PTSD predicted an increased PTSD risk following a subsequent trauma. Recently, Cougle, Resnick and Kilpatrick (2009) proposed that the effect of prior trauma might vary by type of prior trauma, a possibility not considered in Breslau et al. They report that childhood sexual or physical assault, in the absence of PTSD, increased the PTSD risk following a subsequent trauma. This report examines the PTSD effects of prior assaultive violence, using data from Breslau et al (1998). The study assessed PTSD in relation to up to three events. Analysis was performed on the subset with PTSD assessment for two distinct events, the earliest trauma and a subsequent trauma (n=967), using as reference persons with no prior trauma (n=972). Neither prior assaultive violence nor other prior traumas, in the absence of PTSD, influenced the subsequent risk of PTSD. In contrast, prior PTSD increased considerably the PTSD risk of a subsequent trauma. The limitations in Cougle et al (2009) and in this study and future research directions are discussed.

Keywords

Posttraumatic stress disorder; PTSD; prior assaultive violence

Elevated rates of prior trauma have been reported by Vietnam veterans and civilians with posttraumatic stress disorder (PTSD) (Bremner, Southwick, Johnson, Yehuda, & Charney, 1993; Breslau, Chilcoat, Kessler, & Davis, 1999; King, King, Foy, & Gudanowski, 1996; Kulka, Fairbank, Hough, Jordan, & Marmar, 1990; Zaidi & Foy, 1994), leading to the generalization that prior trauma increases the risk of (“sensitizes to”) PTSD following a subsequent trauma. Breslau, Peterson, and Shultz (2008) pointed out that studies on prior trauma suffer a serious limitation. They have not obtained information on the psychiatric response to the prior trauma, specifically, whether or not the prior trauma had resulted in PTSD. In the absence of that information, there is no way to evaluate the effect of prior trauma alone, in the absence of PTSD, on the subsequent risk of PTSD. That evaluation is critical for interpreting the reported higher rates of prior trauma in persons with PTSD. Evidence that previously exposed persons are at increased risk of subsequent PTSD *only* if they had

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developed PTSD following the prior trauma would not support the notion that trauma per se increases the PTSD risk of a subsequent trauma. Such evidence would suggest that trauma precipitates PTSD in persons with preexisting susceptibility. A predisposition to a pathological response to stressors (that had already been present before the prior trauma occurred) might account for the PTSD response to the prior trauma as well as to the subsequent trauma. Breslau et al. (2008) presented results on the PTSD risk of a subsequent trauma associated with prior trauma, based on data from a longitudinal study that included information on the PTSD response to the prior trauma. They reported that when prior trauma was classified according to whether or not it had resulted in PTSD, only prior PTSD predicted an increased PTSD risk following a subsequent trauma; prior trauma alone, in the absence of PTSD, did not predict an increased PTSD risk following a subsequent trauma, relative to no prior trauma.

Recently, Cougle, Resnick, and Kilpatrick (2009) have raised the possibility that the effect of prior trauma might vary by the type of the prior trauma. They proposed that prior interpersonal assault might be more potent than a traumatic event of lesser magnitude in “sensitizing” victims to the PTSD effect of a subsequent trauma, a possibility not considered in Breslau et al. (2008). Cougle et al. examined this question in a study of adolescents, re-interviewed eight years after baseline. They reported that prior exposure to sexual/physical assault in childhood (as reported at baseline by the 12–17 years old respondents) increased the PTSD risk from a subsequent assault or witnessing violence. The ascertainment of PTSD in Cougle et al., described in an earlier article that the authors cite for a detailed account of their assessment (Kilpatrick et al., 2000), departs from the DSM definition that requires an identified event and a link between the criterion symptoms and the event. In their study, respondents were first queried about a list of events and then about PTSD symptoms with no specific referent event. As a result, it is unclear which event resulted in PTSD or even whether the required criterion features resulted from a single traumatic event (Breslau, Chase, & Anthony, 2002; Tolin & Foa, 2006). A connection with a specified event, required in the DSM definition of PTSD, is at the heart of the question raised by Cougle et al., that is, does prior interpersonal assault *specifically* increase the risk of PTSD from a subsequent trauma? Although they include witnessing violence as a covariate in their model, the analysis does not overcome the assessment problem. Moreover, there is no decisive information in their analysis on prior assault per se as a “sensitizing” event that increases the PTSD risk of a subsequent event.

Theoretical or empirical basis for a differential effect by type of prior trauma has not been articulated by Cougle et al. They cite a meta-analysis of risk factors for PTSD by Ozer, Best, and Lipsey (2002) for finding that prior traumatic event exposure was more strongly predictive of subsequent PTSD “when it involved interpersonal violence than an accident” (Cougle et al. page 1013). But an examination of the report by Ozer et al. reveals that in fact it contradicts what Cougle et al. take it to have found. Ozer et al. did not identify any characteristic of prior trauma as a modifier of the PTSD effect of a subsequent trauma. What Ozer et al. found is that the effect of prior trauma (unspecified with regard to type) varied according to type of *target* (i.e. subsequent) *event*, specifically, whether the subsequent event was non-combat interpersonal violence vs. an accident (page 57). Although assaultive violence has been associated in previous research with a higher PTSD risk than other event types, the finding does not imply that prior assault *in the absence of PTSD* would be more potent than other prior events in increasing victims’ susceptibility to PTSD following subsequent events.

In this report, we present new findings on the effects of prior assault on the PTSD risk of a subsequent trauma. Data come from a cross-sectional epidemiologic study that evaluated the PTSD effects of up to three traumatic events :1) an event singled out by the respondent as the worst; 2) a randomly selected event from the entire list of events experienced by each respondent; 3) respondent’s earliest traumatic event (Breslau et al., 1998). In this analysis, we use the randomly selected event as the target (subsequent) event, and evaluate the effect of the

prior event (earliest event) on the PTSD effect of the target event. The random event method provides an estimate of PTSD associated with a representative sample of the entire pool of traumatic events experienced in the community and is free of the potential bias associated with the “worst event” method (Kessler et al 1999; Breslau et al., 1998), as we describe under Methods..

Methods

Sample

The 1996 Detroit Area Survey of Trauma is a representative sample of 2181 persons 18 to 45 years of age in the Detroit primary metropolitan statistical area (PMSA). Detailed information on the sample and data appears elsewhere (Breslau et al., 1998). A random-digit dialing method was used to select the sample. A total of 6110 households were contacted. Screening for age eligibility was completed in 76.2% of households, of which 64.1% contained an age-eligible respondent. In households with more than 1 age-eligible respondent, a random respondent was selected. Cooperation rate in eligible households was 86.8%.

Assessment of traumatic events and PTSD

Trained interviewers administered a computer-assisted telephone interview, averaging 30 minutes. The interview began with a complete enumeration of traumatic events, using a list of 19 types of traumatic events, which operationalized the DSM-IV definition as explicated in its accompanying text. An endorsement of an event type was followed by questions on the number of times an event of that type had occurred and the respondent's age at each time.

A computer-assembled list of all the events reported by the respondent was read by the interviewer and the respondent was asked to identify the one event that was most upsetting, *the worst trauma*. First, PTSD was evaluated in connection with this event, using the PTSD section of the World Health Organization Composite International Diagnostic Interview (CIDI), Version 2.1. The CIDI is a fully structured diagnostic interview designed to be administered by experienced interviewers without clinical training (World Health Organization, 1997). Second, a *computer-selected random event* from the complete list of events reported by each respondent was then evaluated with respect to PTSD. Third, PTSD was evaluated for the *earliest event* reported by each respondent. Respondents could have met PTSD criteria in connection with up to three events. The responses were used to diagnose PTSD based on DSM-IV criteria.

A note on the random event method is in order. Because the vast majority of community residents report multiple qualifying events, a complete assessment of PTSD for each reported event would impose a heavy respondent's burden. The standard short-cut has been to assess PTSD in relation to the event identified by the respondents as the worst of all the traumatic events they had experienced. The worst event is the event most likely to cause PTSD. However, the worst events represent the extreme end of the distribution, in terms of objective features or psychological distress in the aftermath. It is reasonable to assume that traumas resulting in marked distress would be more likely to be selected as the worst. A contamination of the selection of traumas with their psychological sequelae would spuriously strengthen the association between trauma and PTSD and potentially bias the association between PTSD and risk factors of interest, including prior trauma (Kessler et al 1999). Evidence of a bias with respect to other risk factors has been reported. An unbiased estimate is obtained by eliciting complete account of all the events experienced by each respondent and assessing PTSD for an event randomly selected from each respondent's list.

Statistical analysis

The analysis is based on data from 1939 respondents (89% of the sample) who reported having experienced one or more traumatic events. For 967 respondents (49.9%), the random event occurred subsequent to the earliest event. For these respondents, the earliest event is the *prior event* and the randomly selected event is the *target event* in this analysis. The remainder of those exposed to traumatic events reported either only one event ($n=601$) or two or more events with their earliest event being the same event as the computer-selected random event by chance ($n=371$). The latter subset had no prior events up to the time of the random event, because the random event was their earliest event. The subset with no prior event ($n=972$) serves as the reference group in logistic regression that estimates the PTSD risk associated with the target trauma in relation to prior trauma, classified by type (assaultive violence vs. other) and by the presence vs. absence of prior PTSD. We then repeat the analysis, stratifying the sample by age of earliest trauma, <18 years of age vs. 18 and over.

The category of assaultive violence includes the following events: military combat, rape, held captive/ tortured/ kidnapped, shot/ stabbed, sexual assault other than rape, mugged/ threatened with a weapon, badly beaten-up. Non- assaultive events were direct personal experiences not involving assaultive violence (e.g., serious accidents, disaster), learning about traumatic events experienced by a close relative/friend, and sudden unexpected death of a close relative/friend.

Results

Prior traumatic events and prior PTSD

Before presenting the results on the effects of earliest trauma on the PTSD risk following the target trauma, we summarize the findings on the PTSD outcomes of the earliest traumas among the 967 respondents with earliest trauma preceding the randomly selected trauma. The mean age of the earliest trauma in this subset was 13.4 (± 6.6) and the random trauma, 23.0 (± 7.8). The overall PTSD risk following the the earliest events was 7.0%. Of the 967 respondents, 172 (17.8%) experienced assaultive violence as their earliest event; the PTSD risk following assaultive violence was 16.9%. The PTSD risk following events that did not involve assaultive violence ($n=795$) was considerably lower, 4.9%.

Prior assaultive violence and the PTSD risk following a subsequent event

Table 1 presents the conditional risk of PTSD (in percentages) following the target event in four categories: 1) prior PTSD, 2) prior assaultive event/no PTSD, 3) prior non-assaultive event/no PTSD, and 4) no prior event. The conditional risk of PTSD in persons with prior PTSD was 27.9%. The estimates in persons with no prior PTSD, those with prior assaultive violence and those with prior events that do not involve assaultive violence, were considerably lower, 9.1% and 7.8 %, respectively. The table also presents estimates of the risk of PTSD following the target event, according to prior PTSD and event type. It presents sex-adjusted odds ratios and 95% confidence intervals (CI), with persons with no prior event serving as reference. Only prior PTSD was associated with a significantly increased risk of subsequent PTSD (sex- adjusted OR = 5.57 (95% CI 3.07, 10.13) ($p=0.001$). The estimate for prior assaultive violence/ no PTSD was small and not significant, using no prior event as reference. Neither was it significantly different from the estimate of prior non- assaultive event ($p=0.727$). OR for females vs. males in this analysis was 2.19 (95% CI 1.53, 3.13).

Age of prior trauma <18 and 18 and over

Of the 967 respondents with earliest event preceding the randomly selected event, 738 (76.3%) were <18 years of age when the earliest event occurred. In Table 2, we present results of a logistic regression, stratified by age of prior event, <18 years of age vs. 18 and over. The

conditional risk of PTSD across the prior event categories varied little by age of prior trauma. In each stratum, prior PTSD predicted a robust increase in subsequent PTSD, sex-adjusted OR for <18=4.96 (95% CI 2.52, 9.76) ($p=0.001$) and for 18 and over, 5.69 (95% CI 1.43, 22.60) (0.014), compared to no prior event. Odds ratios for subsequent PTSD associated with prior assaultive violence alone, without PTSD, were not significant either before age 18 or later.

In additional analysis, we examined the possibility that PTSD resulting from the target trauma among respondents with prior PTSD might have been a continuation of an unremitted prior PTSD. In 4 of the 19 respondents (21%) with prior PTSD who developed PTSD following a subsequent trauma, prior PTSD did not remit before the subsequent trauma. Re-analysis of Table 1, excluding these 4 respondents, did not materially alter the results. Odds ratio for subsequent PTSD associated with prior PTSD was 4.29 (95% CI, 2.26, 8.15) ($p=0.001$). Similarly, the results presented in Table 2 were only slightly changed. Odds ratio for subsequent PTSD among 52 respondents whose prior PTSD occurred before age 18 (all 4 with unremitted PTSD are in this age subset) was 3.59 (95% CI, 1.72, 7.49) ($p=0.001$).

Discussion

In this epidemiologic study, we found that prior exposure to assaultive violence in the absence of PTSD did not increase the PTSD effects of a subsequent trauma, relative to no prior trauma. There is no support in these data for the proposition that type of prior trauma, assaultive vs. non-assaultive, matters. Neither prior trauma type, in the absence of PTSD, increased the likelihood that a subsequent trauma would lead to PTSD. The PTSD effects of subsequent traumas did not vary by age of prior assaultive violence, <18 years of age vs. 18 and over. In contrast, prior PTSD, resulting from either type of trauma, occurring either < age 18 or later, predicted a significantly increased risk of PTSD following a subsequent trauma.

The prospective study by Breslau et al. (2008) that reported that prior exposure in the absence of PTSD did not increase the PTSD risk following a subsequent trauma did not consider type of prior trauma. The sample size in that study does not permit re-analysis by prior trauma type. The larger study on which this report is based (Breslau et al., 1998) allows us to address this question. Although it is cross-sectional, the study's methodology has provided a subset of the sample with PTSD assessments in relation to the respondents' earliest trauma as well as a later trauma, as described above. The limitations of the cross-sectional design of this study should be taken into account in interpreting the results. However, these limitations also should be weighed against the problem of attrition in longitudinal studies. The high follow-up completion in Breslau et al. 2008 was achieved through multiple re-assessments over the 10 year follow-up period. The eight-year follow-up completion in Cougle et al. was only 54.5%, raising concerns about potential bias.

The possibility suggested by the findings of Cougle et al. that childhood assault -- sexual, physical or both -- might "sensitize" victims to the PTSD-effects of a subsequent trauma, should be interpreted in light of previous research on childhood trauma. That research has demonstrated that childhood assault is correlated with other childhood adversities, including parental psychiatric and substance use disorders, disrupted home environment, and poverty, factors that contribute to a wide range of adverse outcomes. Without adjusting for these possible confounding effects, the reported increased PTSD risk of a subsequent trauma associated with childhood assault is likely to be biased.

The results of this analysis extend our previous results on prior trauma reported in Breslau et al (2008). That report presented evidence that previously exposed persons are at increased risk for PTSD only if their prior trauma resulted in PTSD. The new study indicates that that observation need not be qualified in regard to the type of the prior trauma. The results, taken

together, do not support the hypothesis that exposure to traumatic events increases the risk of ('sensitizes' to) the PTSD-effects of a subsequent trauma, transforming persons with 'normal' reactions to stressors into persons susceptible to PTSD. They suggest that trauma precipitates PTSD in persons with preexisting susceptibility that had already been present before the prior trauma occurred. Evidence that personal vulnerabilities, chiefly neuroticism, history of major depression and anxiety disorders and family history of psychiatric disorders, increase the risk for PTSD has been consistently reported.

An important implication for future research is that information about the PTSD response to prior trauma is crucial for understanding the role of prior trauma. An unanswered question remains for future inquiry, apart from the need for replication. It might be the case that pathological responses to prior trauma other than PTSD, including severe and prolonged distress symptoms, predict an increased PTSD risk following a subsequent trauma.

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Table 1

Percentages and Sex-adjusted Odds Ratios for Subsequent PTSD by Type of Prior Event and Prior PTSD (n=1939)

	n	%	aOR (95% CI)	p=
Prior PTSD	68	27.9	5.57 (3.07, 10.13)	0.001
Prior Assault/No PTSD	143	9.1	1.54 (0.82, 2.88)	0.183
Prior Non-Assault/No PTSD	756	7.8	1.37 (0.94, 1.99)	0.102
No Prior Event	972	6.2	Reference	

aOR = sex-adjusted odds ratios; 95% confidence interval (CI) in parentheses estimated in a multivariable logistic regression

The difference in aOR of the second and third category is not significant (p=0.727).

Females vs males aOR=2.19 (95% CI 1.54, 3.13).

Table 2

Percentages and Sex Adjusted Odds Ratios for Subsequent PTSD: Age of Earliest Event <18 and 18 and Over

Prior Event <18	n	%	aOR (95% CI)	p=
Prior PTSD	56	28.6	4.96 (2.52, 9.76)	0.001
Prior Assault	101	8.9	1.27 (0.59, 2.73)	0.543
Prior Non-assault	581	8.1	1.24 (0.79, 1.94)	0.354
No Prior	535	6.9	Reference	
Prior Event ≥18	n	%	aOR (95% CI)	p=
Prior PTSD	12	25.0	5.69 (1.43, 22.60)	0.014
Prior Assault	42	9.5	2.03 (0.66, 6.21)	0.216
Prior Non-Assault	175	6.9	1.40 (0.69, 2.90)	0.360
No Prior	437	5.3	Reference	

aOR = sex-adjusted odds ratios; 95% confidence interval (CI) in parentheses estimated in a multivariable logistic regression