

Sex Differences in Trauma and Posttraumatic Stress Disorder: A Quantitative Review of 25 Years of Research

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Meta-analyses of studies yielding sex-specific risk of potentially traumatic events (PTEs) and posttraumatic stress disorder (PTSD) indicated that female participants were more likely than male participants to meet criteria for PTSD, although they were less likely to experience PTEs. Female participants were more likely than male participants to experience sexual assault and child sexual abuse, but less likely to experience accidents, nonsexual assaults, witnessing death or injury, disaster or fire, and combat or war. Among victims of specific PTEs (excluding sexual assault or abuse), female participants exhibited greater PTSD. Thus, sex differences in risk of exposure to particular types of PTE can only partially account for the differential PTSD risk in male and female participants.

Keywords: posttraumatic stress disorder, PTSD, trauma, sex differences, gender

The *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev., or *DSM-IV-TR*; American Psychiatric Association, 2000) defines posttraumatic stress disorder (PTSD) as an anxiety disorder precipitated by a traumatic event and characterized by symptoms of reexperiencing the trauma, avoidance and numbing, and hyperarousal. The codification of posttrauma symptoms into the *DSM* was originally prompted by the high prevalence of male Vietnam veterans seeking treatment (American Psychiatric Association, 1980). However, subsequent epidemiological studies have suggested that PTSD may be more prevalent among women and girls than among men and boys (Breslau & Davis, 1992; Breslau et al., 1998; Davidson, Hughes, Blazer, & George, 1991; Helzer, Robins, & McEvoy, 1987; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995).

The primary aim of this article is to investigate sex¹ differences in vulnerability to PTSD and to investigate contributing factors to the observed differences through a critical review of the extant literature. If, as has been suggested in previous studies, a greater risk of PTSD is observed among female participants than among male participants, it will be necessary to examine possible reasons for this difference. The first possible reason is that women and

girls may be more likely than men and boys to experience potentially traumatic events (PTEs), in which case the higher risk of PTSD might be an artifact of a higher risk of traumatization. However, epidemiological and survey data on this issue are mixed. Some studies (e.g., Cuffe et al., 1998) are consistent with this hypothesis, others (e.g., Giaconia et al., 1995) found no sex differences in PTE risk, and still others (Breslau et al., 1998; Kessler et al., 1995; Norris, 1992) have suggested that men and boys are more likely than women and girls to experience PTEs.

A slightly modified potential explanation for the apparently higher frequency of PTSD is that women and girls tend to experience different kinds of traumatic events (perhaps more severe or pathogenic events) than do men and boys. Judging the relative severity of different types of PTE is problematic, but severity might be surmised from the frequency of PTSD among both male participants and female participants experiencing the event. Large-scale studies have suggested that rape and sexual assault (e.g., Kessler et al., 1995) and combat (e.g., Weiss et al., 1992) are associated with higher risk of PTSD among both sexes than are other types of PTE; hence, a higher prevalence of these experiences among female participants than among male participants might reasonably be interpreted as a contributor to sex differences in PTSD frequency.

However, differences in traumatic experience may not fully account for the observed sex differences in PTSD frequency. To clarify this issue, it is necessary to examine the frequency and severity of PTSD for male and female participants while controlling for the type of PTE experienced (i.e., examining sex differences for male and female participants who report experiencing the same kind of event). If previously obtained sex differences are no

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¹ Throughout this article, we use the term *sex* rather than *gender*. Whereas *sex* represents biological characteristics of male participants and female participants, *gender* represents a much more complex set of social and psychological constructs (Lott & Maluso, 1993), which are beyond the scope of this article.

longer evident within the different types of PTE, one might conclude that different traumatic experience is the primary contributor to PTSD risk. If sex differences remain, however, then other sources of the sex differences must be sought.

A secondary aim of this article is to examine whether key methodological differences between studies might influence any obtained sex differences in traumatic experience and PTSD. One such factor is the age of participants. It is potentially noteworthy that studies of adults (Breslau et al., 1998; Kessler et al., 1995; Norris, 1992) appear to show a higher risk of traumatic experience among male participants, whereas a large study of adolescents (Cuffe et al., 1998) found the opposite. It is not clear, however, whether these findings are applicable to the entire body of research or whether sex differences in PTSD vary according to age. Similarly, the age at which the PTE took place, regardless of the age of participants, may also be a meaningful variable, particularly in the context of sex-specific risks for developing PTSD.

Another potential contributor is whether a given study was conducted using a random, epidemiological sample or a convenience sample such as college students. One potential concern is that convenience samples might be biased in ways that influence perceived sex differences in PTEs and PTSD. One striking example of this possibility comes from Duncan (2000), who found that victims of child abuse are more likely to drop out of college. If girls are more likely to be abused than are boys, then it might follow that college samples would underestimate the true number of women who had been abused; the abused women who did not drop out might also differ from the larger population in terms of PTSD severity. Similarly, we sought to examine whether the use of certain convenience samples (e.g., help-seeking participants, prisoners, homeless participants) influences obtained sex differences.

The form of measurement is another potentially important variable. Many studies assessed traumatic experiences and PTSD using some form of semistructured interview. However, many others used self-report questionnaires for the same purpose. It is possible that men are less likely to report traumatic events (perhaps sexual or nonsexual assault in particular) as well as emotional distress in an interview, where social demand characteristics are likely greater, than they are in a more anonymous written questionnaire.

Categorizing a stressful life event as "traumatic" has proved difficult. The third edition of the *DSM*, the *DSM-III* (American Psychiatric Association, 1980), and the third revised edition, or *DSM-III-R* (American Psychiatric Association, 1987), defined an event as traumatic on the basis of features of the event itself. The fourth edition, or *DSM-IV* (American Psychiatric Association, 1994), however, introduced two new criteria that must be met for a diagnosis of PTSD to be assigned. Criterion A1 specifies that the event involved actual or threatened death or serious injury or a threat to the physical integrity of self or others. Criterion A2 specifies that the person's peritraumatic response involved intense fear, helplessness, or horror. Whether these criteria influence sex-specific reports of PTEs (and subsequent PTSD) remains unclear.

Some studies have assessed the experience of PTEs and PTSD over the participant's entire lifetime, whereas others have asked only about a specific period of time or (in the case of PTSD assessments) current symptoms. In cases where only current PTSD is assessed (which is the case in most studies of PTSD), the likelihood of the disorder is inevitably confounded with the course of the disorder (e.g., remitted

cases of PTSD will be underrepresented, and hence more chronic cases of PTSD will be overrepresented).

Studies also vary with regard to their identification of the index event used in PTSD assessments. In many studies, there is no reference to any specific PTE; for example, a participant might first be queried about a range of different events and then be asked to respond to PTSD questions that have no clear referent. Thus, even if the participant had previously endorsed one or more PTEs, it is not clear which of these events is associated with PTSD symptoms (e.g., a participant who endorsed both an assault and an accident would be asked about the occurrence of nightmares about "a traumatic event" rather than about either event in particular). The possibility thus exists that partial PTSD symptoms secondary to multiple PTEs could be combined to render a diagnosis of PTSD, even if no single PTE was associated with the full range of PTSD symptoms. In other studies, participants who endorsed a range of traumatic experiences selected their "worst-ever" event and described any PTSD symptoms that followed that experience. This is somewhat clearer in that participants are asked to describe PTSD secondary to a specific event, although the event in question is not always reported. Still other studies examined PTSD symptoms related to a specific, named event. In this case, the participant might be asked about nightmares about an assault as well as nightmares about an accident. Alternatively, one of the PTEs could be chosen at random by the experimenter, and PTSD symptoms associated with only that PTE would be assessed. The PTSD diagnosis would be made only if the full range of symptoms could be attributed to a specific PTE. With regard to sex differences in PTSD following specific types of PTE, it would be important to examine whether different strategies of identifying the index event influence any obtained sex differences.

The prospective versus retrospective nature of studies also merits investigation. Although some studies (particularly those investigating PTSD secondary to discrete injury) have followed participants longitudinally from the event onward, this kind of research is difficult to conduct, and most researchers have conducted retrospective analyses. However, retrospective recall of traumatic events, particularly those that occurred many years ago, may be unreliable (Roemer, Litz, Orsillo, Ehlich, & Friedman, 1998; Wessely et al., 2003), and it is not clear whether retrospective recall of events and symptoms affects male and female participants equally.

In this article, we apply meta-analytic procedures (e.g., Glass, McGaw, & Smith, 1981) to address four key questions:

1. Are women and girls more likely than men and boys to meet diagnostic criteria for PTSD?
2. Are women and girls more likely than men and boys to experience a traumatic event?
3. Do male and female participants differ in terms of the type of traumatic experience?
4. Do sex differences in PTSD remain when controlling for type of PTE?

For each of these four questions, we examine the influence of the key demographic and methodological variables described earlier on the derived results.

Method

Study Selection

We identified articles investigating the prevalence of PTEs as well as the prevalence and severity of PTSD among male and female participants through searches of the Medline and PsycINFO electronic databases, reference lists from published literature reviews, and an issue-by-issue search of relevant scientific journals from 1980 (the year of publication of the *DSM-III* and the first official definition of PTSD) through July 2005. Search words for the computerized literature searches were the following: *PTSD*, *posttraumatic stress disorder*, *post-traumatic stress disorder*, *trauma*, *disaster*, *accident*, *combat*, *war*, *abuse*, *assault*, *rape*, and *crime*. We then selected only those articles that were published (journal, book, or book chapter) in English since 1980 that contained both male and female participants, and that were not treatment outcome studies. We also conducted an issue-by-issue search of journals that commonly publish articles on trauma and PTSD; these included *Journal of Traumatic Stress*, *Journal of the American Academy of Child & Adolescent Psychiatry*, *Journal of Anxiety Disorders*, *Behaviour Research and Therapy*, *Journal of Clinical and Consulting Psychology*, and *Journal of Clinical Child Psychology*.

This literature search yielded 2,477 articles, which were then examined for inclusion. From this original pool, 2,187 articles were excluded from analysis. Reasons for study exclusion included the following:

1. The sample consisted of individuals seeking or receiving mental health treatment ($n = 454$). We did, however, include studies with participants who were seeking or receiving nonpsychiatric services such as medical treatment, social services, and the like.
2. The primary aim of the study was to develop or test the psychometric properties of a new assessment instrument ($n = 228$).
3. The study did not provide sex-specific data, and such data could not be obtained from the study author ($n = 383$). For articles that did not provide sex-specific data, the primary author was sent a letter requesting this information.²
4. The article was a review that did not present new data or that only presented qualitative analysis ($n = 173$).
5. The sample consisted solely of PTSD patients (for PTSD studies) or trauma survivors (for trauma studies) and therefore was unsuitable for ascertaining the frequencies of these phenomena ($n = 62$).
6. The sample was all male or all female ($n = 51$).
7. The primary aim of the study was to examine biological factors (e.g., MRI, genetics), psychophysiology, or information processing in PTSD ($n = 143$).
8. The data in the article largely overlapped with data presented in another article ($n = 229$), in which case only one study (the larger one, in cases of partial overlap) was included.
9. The primary aim of the study was to investigate the efficacy of treatment ($n = 95$).

Other exclusions ($n = 369$) included studies in which the traumatic event was not described sufficiently for categorization (e.g., "critical incident at work"), studies (e.g., chart review) that did not involve any formal assessment of PTEs or PTSD, studies in which PTSD symptoms were assessed less than 1 month after the traumatic event, studies in which the trauma clearly would not meet criteria under any *DSM* criteria (e.g., failing

an examination), and studies that included contradictory descriptions of results that could not be resolved by contacting the study author.

We note that some studies met more than one exclusion criterion; each study listed was counted only once and is listed under the first exclusion criterion noted (i.e., once it was clear that a study would be excluded, no further analysis of the study was conducted for additional exclusion criteria). After exclusion, 290 articles representing independent samples were retained; they appear in the reference list of this article.³

Study Coding

Each article was coded for the following variables:

1. The study author and year
2. The number of male and female participants in the sample
3. The number of male and female participants who had experienced any traumatic event
4. The number of male and female participants who had experienced each of a range of types of traumatic events. Because of the difficulty inherent in classifying traumatic experiences by category, we clarify our categorization rules. When the PTE was explicitly labeled using one of the descriptor labels below, it was coded as such unless there was clear evidence that it was inconsistent with our definitions. In such cases, or in cases where the PTE labels were ambiguous, we coded PTEs according to the following criteria: *Sexual assaults* contained all unwanted contact (or attempted contact) of a sexual nature. *Child sexual abuse* included adults' reports of unwanted sexual contact, or any sexual contact with an adult or caregiver, that occurred during childhood or adolescence. Any forcible sexual assault (regardless of perpetrator) reported by children or adolescents was included in this category. An exception was in mixed samples of adolescents and young adults, when sexual assault was specifically identified as having occurred during adulthood. Experts have disagreed about the proper definition of child sexual abuse (e.g., Cutler & Nolen-Hoeksema, 1991); for the present purposes we opted to err on the side of inclusion. *Accidents* contained all nondeliberate forms of injury or property damage, including motor vehicle accidents and industrial accidents, but not including fires. *Disasters* included natural disasters, manmade disasters, and fires. *Nonsexual assaults*

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³ Space limitations preclude a detailed description of every study used in the meta-analysis. A list of the specific studies and the coded variables, as well as a list of the studies not selected for this article, is available from David F. Tolin.

included all acts, attempts, or threats of interpersonal violence that were not of a clearly sexual nature. *Nonsexual child abuse or neglect* included physical abuse or neglect by an adult or caregiver. Unlike our definition of child sexual abuse, we opted not to include physical assaults reported by children and adolescents when the perpetrator was not an adult or caregiver or was not specified. In such cases, the PTE was coded as a nonsexual assault rather than as child abuse. *Combat, war, or terrorism* included the war-related experiences of military personnel or civilians, including acts of terrorism. War refugees were included in this group. *Witnessing death or injury* included witnessing the assault, sudden death, or serious injury of another person. *Illness or unspecified injury* included any PTEs in which the victim was seriously injured or became severely ill (broadly consistent, in our opinion, with *DSM*-based trauma criteria, although this may not have been specified explicitly) and in which the cause of the illness or injury was not specified. Thus, a sample of people injured by motor vehicle accidents would be coded under accidents, rather than under illness or injury. Two independent raters coded type of PTE; initial interrater agreement was high ($\kappa = .94$), and discrepancies were resolved via mutual review of each study by the two raters.

5. The number of male and female participants in the sample (or PTE subsample) diagnosed with PTSD. In most cases, PTSD was diagnosed according to *DSM* criteria. However, some studies diagnosed PTSD according to a cutoff score on a standardized measure of PTSD symptoms. These were included as well, although it should be noted that this may introduce variability into the results, as exceeding a cutoff score on a continuous measure may not necessarily imply "caseness." Some studies used more than one measure of PTSD. To prevent these studies from exerting disproportionate influence, the mean effect size for all PTSD measures within a single study was used. In the case of prospective studies that measured PTSD at more than one time point, a single data point was obtained by taking the mean of each time point beyond 1 month post-PTE (the minimum for the PTSD diagnosis).
6. The mean and standard deviation score on a continuous measure of PTSD for male and female participants. Some studies used modifications of standardized instruments (e.g., to include additional symptoms) that called their psychometric properties into question; these were included in the present analysis. Some studies used the Impact of Events Scale (Horowitz, Wilner, & Alvarez, 1979), which does not map precisely onto the symptoms of PTSD and has been shown to inflate estimates of symptom severity under certain conditions (Lees-Haley, Price, Williams, & Betz, 2001). However, because of its widespread use and because there was no reason to believe that the Impact of Events Scale would show increased or decreased sex differences compared with other measures, we included these studies.
7. In studies that assessed PTSD, whether the sample was or was not selected specifically for having experienced a PTE.
8. Age range of participants (i.e., adult, adolescent, or child). For age coding, samples of young adults and samples of college students were coded as adults. Samples that combined adolescents and young adults were coded as adolescents. Predominantly adult samples that included a small number of adolescents were coded as adults.
9. Whether the study was epidemiological or a convenience sample. Studies were identified as epidemiological if they were

large-scale studies that used some method of ensuring representativeness of the population, for example, random-digit dialing or stratified random sampling.

10. Whether an interview or a questionnaire was used to ascertain the presence of traumatic experience and PTSD symptoms
11. In studies that assessed PTSD, if and how the PTSD questions were linked to the traumatic event. In some studies, the PTSD questions were asked with no specific reference to any PTE. In a typical study of this kind, participants would be asked about a number of traumatic events and would then complete a PTSD measure that did not refer to any specific event; therefore, for participants who had experienced more than one traumatic event, it was not clear which event the person referred to. Other studies asked the PTSD questions with a clear reference to one specific PTE (e.g., "Since your accident, have you had nightmares?"). Still others examined a range of traumatic events and then asked participants to identify their worst-ever or most distressing event; the PTSD questions were then linked explicitly to that event. In studies where this was not discussed (and no clarification could be obtained from the authors or by examining the study measures), it was assumed that the PTSD assessment was not linked to any specific PTE.
12. Whether the assessment covered the person's lifetime or a specific period of time (for assessments of PTE) or current functioning (for assessments of PTSD)
13. Whether the sample represented a special population (e.g., homeless persons, prisoners) that might differ markedly from the overall population
14. When known, whether the traumatic event took place during childhood (prior to age 18) or adulthood (age 18 or older)
15. Whether the sample was seeking some form of nonpsychiatric help, such as medical care or social services
16. Whether *DSM-IV* Criteria A1 (perceived life threat) and A2 (extreme fear) were required to code the event
17. For studies of PTSD, whether the study was prospective (i.e., assessing participants prior to or immediately after the traumatic event, then following them for repeated assessments) or retrospective
18. For samples that reported experiencing combat, war, or terrorism, whether the sample consisted of veterans or civilians

Data Analysis

Data were analyzed using Comprehensive Meta-Analysis (version 2.2) software. For studies reporting dichotomous outcomes (i.e., the presence or absence of a traumatic event or the presence or absence of PTSD), we calculated the DerSimonian-Laird pooled odds ratio (OR) and 95% confidence interval (CI). An OR of 1.0 indicates equal likelihood of observing the event among male and female participants. For continuous data (i.e., mean and standard deviation on a measure of PTSD symptoms), we calculated Cohen's *d*. A *d* value of 0.0 indicates no difference between male and female participants; conventionally, 0.2, 0.5, and 0.8 are taken to represent small, medium, and large effects, respectively (J. Cohen, 1988). For studies investigating the frequency or severity of PTSD symptoms, we looked at these two indices separately (using OR and *d*), as well as together (using *d* as a common effect-size estimate across all studies).

Studies varied greatly according to sample size; this creates a risk that a small, outlying sample will exert disproportionate influence over the mean effect size. To minimize this risk, we weighted effect-size estimates by sample size (Rosenthal, 1991). In this review, all effect-size estimates are for female sex. Therefore, positive effect sizes indicate a greater prevalence of PTSD among female participants; negative effect sizes indicate a greater prevalence among male participants.

To test the so-called “file-drawer effect” (the probability that unpublished null results would eliminate the obtained results), for each significant result we computed the “fail-safe N ” (FSN), or the number of null results that would be needed to overturn a significant result. For the present analyses, we examined the number of studies that would make $p > .05$. Generally, if the FSN is greater than or equal to five times the number of studies in the analysis plus 10 ($x \geq 5k + 10$), the obtained results are considered to be robust against the file-drawer effect (Rosenthal, 1991).

Results

Question 1: Are Women and Girls More Likely Than Men and Boys to Meet Diagnostic Criteria for PTSD?

To address this question, we selected studies that inquired about response to a range of traumatic events rather than to a single type of event. Thus, we included studies in which participants were asked about their experiences with several different types of PTE (e.g., assaults, accidents, and disasters) rather than with only one kind of PTE (e.g., accidents). Single-event studies such as these are discussed later in this section. We note that the PTSD diagnosis has changed somewhat since its introduction to the diagnostic nomenclature, and measures of PTSD have changed as well. Thus, earlier studies using the Diagnostic Interview Schedule for *DSM-III* (American Psychiatric Association, 1980) may have yielded spuriously low estimates of PTSD (see Norris, Foster, & Weishaar, 2002). However, in the absence of any compelling reason to believe that the earlier measures would have over- or underrepre-

sented sex differences in PTSD, these were included in the present analysis.

We obtained 52 separate male–female comparisons representing 40 nonoverlapping studies. The results of this meta-analysis are depicted at the top of Table 1. For each analysis in this section (and in all subsequent sections), a Mantel-Haenzel chi-square was significant ($p < .05$), indicating heterogeneity of variance among the samples. Thus, random effects models were used for all analyses. When all independent samples were combined, a significant mean OR of 1.98 was obtained, indicating that the odds of meeting criteria for PTSD were approximately twice as high among female participants as among male participants. The FSN was 3,883, indicating that the finding was unlikely to be overturned by unpublished null results.

The observed twofold risk of PTSD among female participants compared with male participants may be affected by demographic and methodological variables that we addressed in subsequent analyses, the results of which are also shown in Table 1. As can be seen in the table, regardless of the methodological variable isolated, the higher frequency of PTSD among female participants remained statistically significant and robust against the file-drawer effect. Examining different levels of each methodological variable, none of the identified variables appeared to influence the finding of elevated risk of PTSD among female participants, as evidenced by overlapping 95% CIs.

Question 2: Are Women and Girls More Likely Than Men and Boys to Experience a Traumatic Event?

We obtained 22 sex comparisons from 19 separate articles that addressed this question. Criteria for inclusion in this analysis were similar to those used for the previous question, except that studies were required to provide an overall number or percentage of male and female participants reporting PTEs rather than PTSD. Studies

Table 1
Sex Differences in the Prevalence of PTSD

Analysis	k	OR	95% CI	p	FSN ^a
All samples	52	1.98	1.76–2.22	<.001	3,883
Sample not selected for PTE	39	1.89	1.66–2.15	<.001	1,871
PTE survivors	9	2.51	1.74–3.62	<.001	188
Lifetime	21	2.27	1.88–2.74	<.001	913
Current	31	1.79	1.54–2.08	<.001	1,004
Adults	27	1.85	1.61–2.14	<.001	1,082
Adolescents and children	21	2.30	1.80–2.93	<.001	576
Interview	32	2.11	1.82–2.45	<.001	1,990
Questionnaire	16	1.64	1.34–2.03	<.001	147
PTSD assessment did not reference a specific PTE	29	1.80	1.56–2.08	<.001	827
PTSD assessment referenced a specific PTE	3	4.08	1.64–10.17	.003	29
PTSD assessment referenced the “worst ever” PTE	16	2.06	1.66–2.55	<.001	508
Specific or “worst ever” PTE	19	2.23	1.80–2.77	<.001	792
Epidemiological sample	26	2.22	1.88–2.62	<.001	1,325
Convenience sample	22	1.71	1.43–2.06	<.001	418
Prisoner/homeless	6	2.16	1.81–2.56	<.001	117
Not prisoner/homeless	42	1.95	1.69–2.26	<.001	2,136

Note. OR values greater than 1.0 indicate a greater probability of PTSD among female participants than among male participants. k = number of studies; OR = mean DerSimonian-Laird odds ratio; CI = confidence interval; FSN = fail-safe N ; PTE = potentially traumatic event; PTSD = posttraumatic stress disorder.

^a All FSNs were robust against the file-drawer effect ($FSN > 5k + 10$).

that assessed specific forms of PTEs but did not provide overall PTE rates were excluded, as some participants may have experienced more than one event. Such studies are addressed later in this article.

One study examined both the lifetime incidence of PTEs and the incidence of PTEs within a specified time frame; for pooled comparisons, to preserve sample independence and to balance the period variance as much as possible, we examined only the lifetime data. Two studies assessed the frequency of trauma both with and without *DSM-IV* Criterion A2 (extreme fear); to maintain consistency with the other studies, only the results that did not use Criterion A2 were used for the pooled comparisons (although, as in the previous analyses, both results were used when examining the impact of Criterion A2).

The first row of Table 2 shows the results of meta-analysis of sex differences in the prevalence of PTEs. To adhere to the assumption of independence of samples, we first analyzed only one comparison (as described above) from each of the 19 studies that had independent samples; this yielded a significant mean OR of 0.77 (95% CI = 0.65–0.91, FSN = 475). Thus, across studies, male participants were significantly more likely to report a PTE (broadly defined) than were female participants.

Table 2 also shows the impact of potential moderator variables on the obtained sex difference in the prevalence of PTEs. Unlike the results for Question 1, the results for Question 2 do not appear fully independent of the study methodology. Although male participants were in most cases more likely than female participants to report experiencing a PTE, no significant sex difference was found for studies that might be considered methodologically less strong,

Table 2
Overall Sex Differences in the Prevalence of Potentially Traumatic Events

Analysis	<i>k</i>	OR	95% CI	<i>p</i>	FSN
All samples	19	0.77	0.65–0.91	.002	475 ^a
Adults	11	0.64	0.61–0.68	<.001	321 ^a
Adolescents	8	0.74	0.65–0.84	<.001	9
Children	0	—	—	—	—
Life threat	5	0.56	0.52–0.60	<.001	241 ^a
Life threat and extreme fear	4	0.60	0.56–0.64	<.001	113 ^a
Neither threat nor fear	14	0.79	0.74–0.85	<.001	29
Interview	14	0.67	0.59–0.76	<.001	544 ^a
Questionnaire	5	1.11	0.71–1.73	.662	—
Lifetime	17	0.65	0.62–0.68	<.001	503 ^a
Specific period	3	0.88	0.72–1.07	.192	—
Epidemiological sample	12	0.73	0.63–0.84	<.001	407 ^a
Convenience sample	7	0.83	0.50–1.38	.480	—
Prisoner/homeless	2	1.24	0.67–22.35	.890	—
Not prisoner/homeless	17	0.79	0.67–0.94	.007	414 ^a
Seeking nonpsychiatric help	4	0.83	0.31–2.19	.702	—
Not seeking nonpsychiatric help	15	0.74	0.65–0.86	<.001	461 ^a
PTE during adulthood	1	0.60	0.43–0.83	.002	—
PTE during childhood	4	0.88	0.50–1.55	.066	—
Unknown or mixed time of PTE	14	0.76	0.63–0.92	.004	356 ^a

Note. OR values less than 1.0 indicate a greater probability of potentially traumatic events (PTEs) among male participants than among female participants. *k* = number of studies; OR = mean DerSimonian-Laird odds ratio; CI = confidence interval; FSN = fail-safe *N*.

^a Finding is robust against the file-drawer effect (FSN > 5*k* + 10).

such as those that used questionnaires, assessed PTE only over a specific time period, used convenience samples, used prisoner or homeless samples, or assessed help-seeking individuals—although, in each of these cases, the number of studies was rather small. No sex difference was found in studies that specifically examined PTEs occurring during childhood. A significant (non-overlapping 95% CI) difference was obtained between studies that did not use *DSM-IV* Criteria A1 (perceived threat) or A2 (extreme fear) versus those that used Criterion A1 and those that used both Criteria A1 and A2 (we found no studies that used A2 but not A1); thus, the sex difference is greater (favoring male participants) when Criterion A1 (and perhaps A2) is used, although it does not disappear when those criteria are not used. We also found a significantly greater sex difference for studies that assessed traumatic events over one's lifetime as compared with those that only examined PTEs within a specified time period. Examination of the latter group (three studies) suggested that the difference was largely due to one study of adolescent students (Hoffmann, 2002) in which traumatic events were assessed over a single year; female participants reported a greater incidence of PTEs due largely to a higher incidence of sexual assault.

In summary, across studies, adult male participants were significantly more likely to report a traumatic experience than were adult female participants (although the findings are not replicated in all studies). The observed relative risk of exposure to PTE in male participants and female participants suggests that the twofold risk of PTSD found for female participants (see Question 1) is not due to an increased overall risk of trauma. Indeed, the higher PTSD prevalence among female participants appears to occur despite a significantly lower overall probability of exposure to PTE. An alternative explanation is that compared with male participants, female participants are more likely to experience certain types of PTE that are disproportionately likely to lead to PTSD. In the next section, we examine sex differences in the prevalence of these and other types of traumatic experience.

Question 3: Do Male and Female Participants Differ in Terms of the Type of Traumatic Experience?

Sixty-four separate articles, containing 482 independent comparisons of the frequency of different types of PTE among male participants and female participants, were identified for this question. Criteria for inclusion in this analysis were similar to those used in the previous questions, except that studies were required to provide a number or percentage of male participants and female participants reporting specific types of PTE rather than the prevalence of trauma in general. In most cases, the studies were broad based, asking participants about a range of different experiences and providing sex-specific frequencies of each. In other cases, the studies were more narrowly focused, examining the frequency of only one or two specific traumatic events.

Three studies provided estimates of both current and lifetime PTSD. As with Question 1, both types of data were included in the comparison of current versus lifetime PTSD; for pooled comparisons, to preserve sample independence and to balance the period variance as much as possible, only the lifetime PTSD data were used. Results for each PTE type are shown in Table 3.

Adult sexual assault. Meta-analysis of the 41 comparisons indicated a significantly higher frequency of adult sexual assault

Table 3
Sex Differences in the Prevalence of Specific Types of Potentially Traumatic Event (PTE)

Analysis	<i>k</i>	OR	95% CI	<i>p</i>	FSN
Adult sexual assault					
All samples	41	5.99	4.42–8.93	<.001	12,751 ^a
Interview	16	7.46	4.93–11.30	<.001	2,621 ^a
Questionnaire	25	5.20	3.32–8.13	<.001	3,788 ^a
Life threat and extreme fear	6	5.94	3.09–11.42	<.001	307 ^a
Neither threat nor fear	35	5.97	4.22–8.43	<.001	9,073 ^a
Lifetime	41	5.99	4.42–8.93	<.001	12,751 ^a
Specific period	1	0.09	0.01–1.58	.099	—
Epidemiological sample	13	5.70	3.58–9.09	<.001	1,763 ^a
Convenience sample	28	6.12	4.03–9.29	<.001	5,008 ^a
Prisoner/homeless	3	12.62	6.54–24.35	<.001	78 ^a
Not prisoner/homeless	40	5.63	4.11–7.71	<.001	10,909 ^a
Seeking nonpsychiatric help	4	12.60	7.31–21.74	<.001	93 ^a
Not seeking nonpsychiatric help	37	5.60	4.07–7.70	<.001	10,625 ^a
Child sexual abuse					
All samples	35	2.66	2.05–3.44	<.001	3,910 ^a
Adults	8	2.94	1.87–4.63	<.001	364 ^a
Adolescents	23	2.65	1.86–3.79	<.001	1,435 ^a
Children	4	2.66	2.02–3.52	<.001	25
Adolescents and children	27	2.60	1.89–3.58	<.001	1,869 ^a
Interview	9	3.06	1.84–5.08	<.001	406 ^a
Questionnaire	26	2.56	1.87–3.49	<.001	1,776 ^a
Life threat and extreme fear	3	3.62	1.35–9.76	.011	31 ^a
Neither threat nor fear	32	2.60	1.98–3.40	<.001	3,220 ^a
Lifetime	34	2.70	2.04–3.57	<.001	3,426 ^a
Specific period	2	2.56	1.73–3.81	<.001	—
Epidemiological sample	15	2.53	2.00–3.21	<.001	1,032 ^a
Convenience sample	20	2.90	1.84–4.57	<.001	908 ^a
Prisoner/homeless	2	16.27	9.50–27.87	<.001	—
Not prisoner/homeless	39	2.71	2.18–3.37	<.001	6,932 ^a
Seeking nonpsychiatric help	3	15.61	9.19–26.52	<.001	51 ^a
Not seeking nonpsychiatric help	32	2.37	1.85–3.04	<.001	3,046 ^a
Nonsexual child abuse or neglect					
All samples	30	1.16	0.98–1.39	.090	—
Adults	13	1.19	0.88–1.60	.250	—
Adolescents	15	1.09	0.92–1.29	.336	—
Children	2	2.13	0.90–5.06	.086	—
Adolescents and children	17	1.16	0.96–1.37	.120	—
Interview	4	1.59	1.12–2.25	.009	18
Questionnaire	26	1.10	0.90–1.33	.357	—
Life threat and extreme fear	1	1.19	0.79–1.80	.400	—
Neither threat nor fear	29	1.16	0.97–1.40	.101	—
Lifetime	30	1.16	0.98–1.39	.090	—
Specific period	2	1.31	0.58–2.99	.516	—
Epidemiological sample	12	1.18	0.91–1.54	.215	—
Convenience sample	18	1.15	0.90–1.48	.271	—
Prisoner/homeless	0	—	—	—	—
Not prisoner/homeless	30	1.16	0.98–1.39	.090	—
Seeking nonpsychiatric help	3	1.40	0.81–2.42	.230	—
Not seeking nonpsychiatric help	27	1.12	0.94–1.33	.198	—
Accidents					
All samples	34	0.67	0.57–0.79	<.001	2,186 ^a
Adults	20	0.66	0.53–0.82	<.001	1,232 ^a
Adolescents	13	0.68	0.58–0.80	<.001	119 ^a
Children	1	0.83	0.40–1.71	.612	—
Adolescents and children	14	0.69	0.59–0.81	<.001	124 ^a
Interview	18	0.64	0.50–0.81	<.001	1,153 ^a
Questionnaire	16	0.71	0.63–0.81	<.001	151 ^a
Life threat and extreme fear	6	0.61	0.39–0.97	.035	270 ^a
Neither threat nor fear	28	0.68	0.59–0.80	<.001	904 ^a
Lifetime	33	0.66	0.56–0.78	<.001	2,189 ^a
Specific period	3	1.01	0.72–1.41	.986	—
Epidemiological sample	18	0.70	0.55–0.90	.004	889 ^a
Convenience sample	16	0.67	0.60–0.74	<.001	274 ^a
Prisoner/homeless	3	0.53	0.42–0.68	<.001	16
Not prisoner/homeless	31	0.68	0.58–0.81	<.001	1,803 ^a

(table continues)

Table 3 (continued)

Analysis	<i>k</i>	OR	95% CI	<i>p</i>	FSN
Seeking nonpsychiatric help	3	0.53	0.42–0.68	<.001	16
Not seeking nonpsychiatric help	31	0.68	0.58–0.81	<.001	1,803 ^a
Event occurred after age 18	1	0.74	0.58–0.95	.016	—
Event occurred before age 18	8	0.76	0.59–0.97	.030	19
Unknown or mixed age at time of event	25	0.64	0.53–0.78	<.001	1,634 ^a
Nonsexual assault					
All samples	114	0.62	0.56–0.69	<.001	23,491 ^a
Adults	56	0.60	0.52–0.68	<.001	7,159 ^a
Adolescents	47	0.59	0.49–0.70	<.001	4,228 ^a
Children	11	0.97	0.57–1.67	.924	—
Adolescents and children	58	0.64	0.54–0.76	<.001	4,662 ^a
Interview	47	0.67	0.57–0.78	<.001	4,484 ^a
Questionnaire	67	0.59	0.51–0.69	<.001	7,386 ^a
Life threat and extreme fear	13	0.52	0.41–0.67	<.001	896 ^a
Neither threat nor fear	101	0.64	0.56–0.71	<.001	15,149 ^a
Lifetime	101	0.61	0.55–0.68	<.001	15,971 ^a
Specific period	21	0.68	0.51–0.90	.008	907 ^a
Epidemiological sample	32	0.64	0.54–0.76	<.001	3,659 ^a
Convenience sample	82	0.61	0.53–0.70	<.001	8,546 ^a
Prisoner/homeless	8	0.74	0.53–1.05	.091	—
Not prisoner/homeless	106	0.61	0.55–0.69	<.001	21,856 ^a
Seeking nonpsychiatric help	17	0.64	0.46–0.90	.010	106 ^a
Not seeking nonpsychiatric help	97	0.62	0.55–0.69	<.001	20,226 ^a
Event occurred after age 18	4	0.63	0.40–0.98	.042	74 ^a
Event occurred before age 18	39	0.62	0.52–0.74	<.001	1,833 ^a
Unknown or mixed age at time of event	71	0.62	0.54–0.72	<.001	10,250 ^a
Combat, war, or terrorism					
All samples	25	0.28	0.18–0.43	<.001	2,641 ^a
Adults	19	0.28	0.18–0.43	<.001	1,777 ^a
Adolescents	4	0.32	0.05–2.19	.248	—
Children	2	0.44	0.13–1.56	.205	—
Adolescents and children	6	0.37	0.08–1.69	.201	—
Interview	12	0.20	0.08–0.47	<.001	252 ^a
Questionnaire	13	0.32	0.19–0.53	<.001	1,241 ^a
Life threat and extreme fear	5	0.34	0.08–1.39	.133	—
Neither threat nor fear	20	0.27	0.17–0.42	<.001	1,861 ^a
Lifetime	25	0.28	0.18–0.43	<.001	2,641 ^a
Specific period	0	—	—	—	—
Epidemiological sample	14	0.25	0.15–0.41	<.001	1,564 ^a
Convenience sample	11	0.37	0.12–1.09	.072	—
Prisoner/homeless	3	0.50	0.06–3.85	.504	—
Not prisoner/homeless	22	0.26	0.16–0.40	<.001	2,567 ^a
Seeking nonpsychiatric help	3	0.50	0.06–3.85	.504	—
Not seeking nonpsychiatric help	22	0.26	0.16–0.40	<.001	2,567 ^a
Event occurred after age 18	1	1.00	0.25–3.96	1.000	—
Event occurred before age 18	2	0.44	0.13–1.56	0.205	—
Unknown or mixed age at time of event	22	0.26	0.16–0.40	<.001	2,565 ^a
Disaster or fire					
All samples	33	0.80	0.72–0.88	<.001	403 ^a
Adults	22	0.79	0.71–0.89	<.001	216 ^a
Adolescents	9	0.77	0.62–0.97	.024	20
Children	2	0.91	0.51–1.64	.757	—
Adolescents and children	11	0.80	0.66–0.97	.022	19
Interview	18	0.81	0.70–0.94	.005	132 ^a
Questionnaire	15	0.80	0.72–0.90	<.001	60
Life threat and extreme fear	4	0.76	0.56–1.05	.097	—
Neither threat nor fear	29	0.81	0.75–0.87	<.001	183 ^a
Lifetime	32	0.79	0.72–0.88	<.001	414 ^a
Specific period	4	1.11	0.32–3.80	.869	—
Epidemiological sample	14	0.79	0.67–0.94	.006	119 ^a
Convenience sample	19	0.82	0.74–0.90	<.001	69
Prisoner/homeless	2	0.95	0.65–1.38	.777	—
Not prisoner/homeless	31	0.79	0.71–0.87	<.001	392 ^a
Seeking nonpsychiatric help	4	0.92	0.66–1.27	.604	—
Not seeking nonpsychiatric help	29	0.79	0.71–0.88	<.001	378 ^a
Event occurred after age 18	1	0.85	0.67–1.08	.179	—
Event occurred before age 18	7	0.84	0.67–1.05	.121	—
Unknown or mixed age at time of event	25	0.78	0.70–0.88	<.001	274 ^a

Table 3 (continued)

Analysis	<i>k</i>	OR	95% CI	<i>p</i>	FSN
Witnessing death or injury					
All samples	105	0.80	0.72–0.90	<.001	7,831 ^a
Adults	40	0.76	0.62–0.94	.009	3,203 ^a
Adolescents	54	0.82	0.73–0.91	<.001	939 ^a
Children	11	0.96	0.78–1.19	.725	—
Adolescents and children	65	0.83	0.75–0.92	<.001	969 ^a
Interview	37	0.77	0.63–0.93	.007	2,024 ^a
Questionnaire	68	0.82	0.73–0.93	.002	1,842 ^a
Life threat and extreme fear	19	0.76	0.57–1.01	.061	—
Neither threat nor fear	86	0.81	0.72–0.91	<.001	3,847 ^a
Lifetime	94	0.79	0.70–0.90	<.001	5,880 ^a
Specific period	13	0.90	0.74–1.10	.288	—
Epidemiological sample	27	0.68	0.54–0.85	.001	3,502 ^a
Convenience sample	78	0.86	0.78–0.94	.001	804 ^a
Prisoner/homeless	8	0.65	0.54–0.79	<.001	18
Not prisoner/homeless	97	0.81	0.72–0.91	<.001	6,965 ^a
Seeking nonpsychiatric help	15	0.80	0.62–1.02	.076	—
Not seeking nonpsychiatric help	90	0.80	0.71–0.90	<.001	7,095 ^a
Event occurred after age 18	4	0.97	0.68–1.38	.877	—
Event occurred before age 18	46	0.81	0.71–0.93	.002	229
Unknown or mixed age at time of event	55	0.79	0.67–0.91	.002	5,122 ^a
Illness or unspecified injury					
All samples	17	0.68	0.54–0.86	.001	217 ^a
Adults	12	0.65	0.50–0.85	.001	164 ^a
Adolescents	3	0.78	0.33–1.83	.565	—
Children	2	0.90	0.48–1.69	.743	—
Adolescents and children	5	0.83	0.46–1.50	.529	—
Interview	8	0.76	0.42–1.38	.374	—
Questionnaire	9	0.64	0.51–0.80	<.001	103 ^a
Life threat and extreme fear	3	0.90	0.33–2.50	.839	—
Neither threat nor fear	14	0.63	0.52–0.78	<.001	191 ^a
Lifetime	17	0.68	0.54–0.86	.001	217 ^a
Specific period	0	—	—	—	—
Epidemiological sample	6	0.83	0.52–1.34	.447	—
Convenience sample	11	0.61	0.48–0.78	<.001	102 ^a
Prisoner/homeless	0	—	—	—	—
Not prisoner/homeless	17	0.68	0.54–0.86	.001	217 ^a
Seeking nonpsychiatric help	4	0.73	0.44–1.24	.245	—
Not seeking nonpsychiatric help	13	0.68	0.53–0.88	.003	176 ^a
Event occurred after age 18	1	0.51	0.36–0.72	<.001	—
Event occurred before age 18	3	0.98	0.64–1.52	.940	—
Unknown or mixed age at time of event	13	0.66	0.50–0.87	.003	166 ^a

Note. OR values less than 1.0 indicate a greater probability of PTE among male participants than among female participants; OR values greater than 1.0 indicate a greater probability of PTE among female participants than among male participants. *k* = number of studies; OR = mean DerSimonian–Laird odds ratio; CI = confidence interval; FSN = fail-safe *N*.

^a Finding is robust against the file-drawer effect (FSN > 5*k* + 10).

among female participants than among male participants (OR = 5.99, 95% CI = 4.42–8.93). As shown in Table 3, this finding was significant and robust against the file-drawer effect in all cases except for a single study that examined the incidence of adult sexual assault with a discrete period of time. This study yielded a significantly lower OR than did those assessing lifetime (entire adulthood) frequency of adult sexual assault. Because male participants are usually presumed to be reluctant to report sexual trauma (Finkelhor, 1984; Groth & Burgess, 1980; Pino & Meier, 1999), one might expect that the sex difference would diminish when anonymous questionnaires were used rather than individual interviews; although the OR was somewhat lower, this was not significant, and a clearly higher frequency of reported sexual assault was evident among female participants regardless of how the data were gathered.

Child sexual abuse. Across 35 comparisons of the frequency of child sexual abuse in male versus female participants, a significantly greater frequency was found for female participants (OR = 2.66, 95% CI = 2.05–3.44). As shown in Table 3, this sex difference was evident across the entire range of methodological variables, although it was not robust against the file-drawer effect for samples of children and FSN could not be calculated for studies that assessed child sexual abuse within a specific time period or that used prisoner or homeless samples, owing to the small number of studies. The sex difference was significantly greater among prisoner, homeless, and help-seeking samples than among other samples.

Nonsexual child abuse or neglect. Across 30 comparisons of sex differences in the frequency of nonsexual child abuse or neglect, no difference was found between male and female partic-

ipants (OR = 1.16, 95% CI = 0.98–1.39). This null finding repeated across all methodological variables; the only exception was that for the four studies assessing PTE via interview, female participants were more likely than male participants to report nonsexual child abuse or neglect. However, this finding was not robust against the file-drawer effect.

Accidents. We identified 34 comparisons of the frequency of accidents for male and female participants. These studies indicated that male participants were significantly more likely to report accidents than were female participants (OR = 0.67, 95% CI = 0.57–0.79). This finding was repeated across most methodological variations, although it was not significant in the lone study of children or across three studies that assessed the incidence of accidents within a discrete period of time. The effect was significant, but not robust, across three studies that had both help-seeking and prisoner or homeless samples, as well as across eight studies in which the accident clearly took place before age 18 (we note that for most studies, regardless of the type of PTE, participants' age at the time of the event was not clearly specified and therefore the studies were coded as "unknown or mixed age at time of event").

Nonsexual assault. One hundred fourteen comparisons indicated that male participants were significantly more likely to report experiencing nonsexual assault than were female participants (OR = 0.62, 95% CI = 0.56–0.69). As shown in Table 3, the age of the sample may have affected this finding; the sex difference was not significant among children, although adults, adolescents, and children did not differ significantly from one another in terms of sex differences in nonsexual assault. The sex difference was also not significant across eight prisoner or homeless samples.

Combat, war, or terrorism. We found 25 comparisons of male and female participants' reports of combat, war, or terrorism. Overall, male participants were significantly more likely than female participants to report this form of PTE (OR = 0.28, 95% CI = 0.18–0.43). However, as shown in Table 3, this finding was true only for adults; adolescent and child samples did not show a significant sex difference, possibly due to the small number of studies. The difference was also not significant when *DSM-IV* Criteria A1 and A2 were employed in the PTE definition; when convenience samples, prisoner or homeless samples, or help-seeking samples were used; or when the age of the participant at the time of the PTE was specified. In each of these cases, the small number of studies per group may have obscured any actual sex differences.

Disaster or fire. Across 33 comparisons, male participants were more likely to endorse a history of serious accidents than were female participants (OR = 0.80, 95% CI = 0.72–0.88). This finding was significant and robust only for adult samples, however. The finding was significant regardless of the method of assessment but was robust only in studies employing interviews rather than questionnaires. The sex difference was not significant when *DSM-IV* Criteria A1 and A2 were employed in the trauma definition, when the incidence of disaster or fire was assessed over a discrete time period; when prisoner, homeless, or help-seeking samples were used; or when participants' age at the time of the event was specified.

Witnessing death or injury. Examination of 105 separate comparisons of male versus female participants' reports of witnessing death or injury indicated that male participants were more likely to

report this PTE than were female participants (OR = 0.80, 95% CI = 0.72–0.90). This finding was significant and robust for adult and adolescent but not child samples. The sex difference was not different when *DSM-IV* Criteria A1 and A2 were employed in the trauma definition, when the incidence of the PTE was assessed over a discrete time period, when help-seeking samples were used, or when it was clearly specified that the PTE took place after age 18.

Illness or unspecified injury. We obtained 17 comparisons that address the frequency of serious illness or unspecified (i.e., not captured in the above categories) injury among male and female participants. Across studies, male participants were more likely to report this event than were female participants (OR = 0.68, 95% CI = 0.54–0.86). Due to the relatively small number of studies, examination of several methodological variables was not possible. Adolescent and child samples did not show a significant sex difference. The difference was not significant when PTE history was assessed via interview, when *DSM-IV* Criteria A1 and A2 were used, among epidemiological samples, among help-seeking samples, or when the event clearly occurred during childhood.

In summary, the finding (Question 2) that male participants are more likely than female participants to report a history of trauma appears to be true only for certain event categories. Male participants are more likely to report experiencing accidents, nonsexual assault, combat or war, disaster or fire, serious illness or unspecified injury, and witnessing death or injury than are female participants. On the other hand, sexual assault or abuse, whether occurring in childhood or in adulthood, is reported more frequently by female participants. It is possible that these sex differences in the frequency of specific PTEs (e.g., sexual assault) contribute to the obtained sex differences in the overall prevalence of PTSD. However, to examine this hypothesis more fully, it is necessary to examine PTSD prevalence for male versus female participants who have experienced the same type of traumatic event. If sex differences in PTSD are not evident within the different PTE categories, one might conclude that PTE type is the primary contributor to sex differences in PTSD risk. If sex differences remain within PTE categories, however, then other factors may account for the overall sex difference. Below, we examine the sex-specific risk of PTSD when controlling for type of traumatic experience.

Question 4: Do Sex Differences in PTSD Remain When Controlling for Type of Trauma?

To address this question, we identified 321 comparisons from 216 separate articles that compared either the frequency (227 comparisons) or severity (94 comparisons) of PTSD for male versus female participants. In the studies of PTSD frequency, the PTSD variable was nominal (coded simply as present or absent). In studies of PTSD severity, PTSD was reported on a continuum (on a standardized instrument). We analyzed studies using dichotomous and continual data separately as well as together, given the potential differences in outcomes for diagnoses versus indices (Mirowsky, 1994). For the examination of PTSD frequency by sex, we used OR, weighted by sample size. For studies employing continuous measures of PTSD severity, we calculated the effect-size estimate *d* (J. Cohen, 1988), weighted according to sample size. For the combined analysis (in which dichotomous and con-

tinuous measures were pooled), we used d as a standard estimate of effect size. As in previous analyses, all statistics are for female sex. Therefore, OR values greater than 1.00 and d values greater than 0.00 indicate a higher frequency or severity of PTSD among female participants; OR values less than 1.00 and d values less than 0.00 indicate a greater prevalence or severity of PTSD among male participants. Table 4 shows sex differences in the prevalence and severity of PTSD within PTE categories.

Adult sexual assault. Quantitative data on the sex-specific effects of sexual assault occurring during adulthood are sparse; only four independent comparisons of the prevalence of PTSD were available. No studies were available examining the severity of PTSD secondary to adult sexual assault for male and female participants. The limited available data indicate no overall sex difference in PTSD frequency for male versus female survivors of adult sexual assault (OR = 1.10, 95% CI = 0.46–2.59). None of the identified methodological variables altered this finding, although the small number of studies may have obscured actual differences.

Child sexual abuse. Only 10 comparisons of PTSD in male versus female child sexual abuse victims were identified. This was rather surprising, given the widespread interest in child sexual abuse as a potential etiological factor in psychopathology. However, most studies of child sexual abuse survivors assessed constructs other than PTSD, such as general anxiety, depression, or self-esteem. Many sampled only male participants or female participants, making sex comparisons impossible. Some studies sampled only individuals who were seeking or receiving inpatient or outpatient psychiatric services, thus producing a high risk of sampling bias. The seven sampled studies of PTSD prevalence indicated no significant difference between male and female child sexual abuse victims (OR = 1.71, 95% CI = 0.91–3.21); the three studies of the severity of PTSD also did not reveal a sex difference ($d = -1.02$, 95% CI = -3.99 – 1.95). As can be seen in Table 4, the null findings greatly outnumber the significant findings of sex differences. Although there are some variations according to methodological variables (largely the result of a small number of studies), the combined studies (Table 4, right columns) indicate greater PTSD frequency or severity among female participants only among adults (although child samples just missed significance, $p = .058$), when diagnostic interviews were employed, when *DSM-IV* Criteria A1 and A2 were used, when lifetime PTSD was assessed, and when help-seeking samples were used. One study, in which the PTSD assessment required that child sexual abuse be labeled the worst-ever event, showed a significantly greater severity of PTSD symptoms among male participants than among female participants. None of the significant results were robust against the file-drawer effect.

Nonsexual child abuse or neglect. There were only eight studies that provided sex-specific information about the frequency or severity of PTSD among victims of nonsexual child abuse or neglect. The seven studies of PTSD frequency yielded no significant difference between male and female participants (OR = 1.43, 95% CI = 0.62–3.26). Similarly, the single study of PTSD severity did not show a sex difference ($d = -0.04$, 95% CI = -0.78 – 0.70). As shown in Table 4, the sole exception to this null result was the finding, in one study of a help-seeking sample, showing a higher frequency of PTSD among male participants than among female participants.

Accidents. We identified 44 comparisons of PTSD in male versus female accident victims. The 40 diagnostic studies showed a significant and robust effect, with female participants exhibiting a higher frequency of PTSD than did male participants (OR = 1.81, 95% CI = 1.51–2.17). The 4 studies of PTSD severity also showed significantly greater severity of symptoms among female participants ($d = 0.29$, 95% CI = 0.12–0.47), although this effect was not robust against the file-drawer effect. When pooled, the 44 studies showed a small but significant and robust effect, with greater frequency or severity of PTSD among female participants ($d = 0.32$, 95% CI = 0.23–0.42). As shown in Table 4, the finding of greater PTSD among female versus male accident victims was generally consistent across methodological variables, although it just missed significance ($p = .057$) in the only prisoner or homeless sample. In several instances, the effect was not robust against the file-drawer effect, likely due to the small number of studies in each group.

Nonsexual assault. Twenty-five comparisons described PTSD following nonsexual assault for male and female participants. Most of these ($n = 19$) reported the frequency of PTSD diagnosis; these showed significantly and robustly higher risk of PTSD among female participants than among male participants (OR = 4.11, 95% CI = 2.37–7.13). The 6 severity comparisons also showed a significantly greater severity of PTSD symptoms among female participants ($d = 0.30$, 95% CI = 0.03–0.57), although this finding was not robust. When pooled, the 25 combined studies showed significantly and robustly greater PTSD among female participants than among male participants ($d = 0.65$, 95% CI = 0.41–0.90). Table 4 shows that the finding of higher PTSD frequency among female participants emerged across most conditions, although the finding was less consistent among the smaller number of severity studies. When studies were pooled, the higher frequency of PTSD among female participants was significant across all conditions except for child samples and prospective studies.

Combat, war, or terrorism. We identified 96 comparisons of PTSD in male and female participants who reported experiencing combat, war, or terrorism. The 60 comparisons of PTSD frequency showed a significantly and robustly greater likelihood of PTSD among female participants than among male participants (OR = 1.33, 95% CI = 1.16–1.53). The 36 continuous-measure comparisons also suggested a significantly and robustly greater severity of PTSD symptoms among female participants ($d = 0.20$, 95% CI = 0.12–0.28); the pooled frequency and severity studies were thus also significant and robust ($d = 0.18$, 95% CI = 0.12–0.23). We did find, however, that the obtained sex differences were true across studies of civilians (e.g., victims of terrorism, war refugees, and people exposed to bombing raids), but not across studies of combat veterans. The pooled studies (Table 4, right columns) showed a significant difference according to the method of data collection, with a significantly greater sex difference for questionnaire studies (which showed more PTSD among female participants) than for interview studies (which showed no sex difference in PTSD). There was no sex difference in PTSD across studies that assessed lifetime prevalence of PTSD; when the PTSD assessment was not specifically linked to the experience of combat, war, or terrorism; in prospective studies; or when the age at the time of the event was not known. Furthermore, although both epidemiological
(text continues on page 975)

Table 4
Sex Differences in the Prevalence of PTSD Within Specific Types of PTEs

Analysis	Diagnosis					Severity					Combined				
	<i>k</i>	OR	95% CI	<i>p</i>	FSN	<i>k</i>	<i>d</i>	95% CI	<i>p</i>	FSN	<i>k</i>	<i>d</i>	95% CI	<i>p</i>	FSN
<i>Adult sexual assault</i>															
All samples	4	1.10	0.46–2.59	.832	—	0	—	—	—	—	4	0.05	−0.42–0.52	.832	—
Interview	4	1.10	0.46–2.59	.832	—	0	—	—	—	—	4	0.05	−0.42–0.52	.832	—
Questionnaire	0	—	—	—	—	0	—	—	—	—	0	—	—	—	—
Life threat and extreme fear	0	—	—	—	—	0	—	—	—	—	0	—	—	—	—
Neither threat nor fear	4	1.10	0.46–2.59	.832	—	0	—	—	—	—	4	0.05	−0.42–0.52	.832	—
Lifetime	2	0.90	0.24–3.34	.880	—	0	—	—	—	—	2	−0.06	−0.78–0.66	.880	—
Current	2	1.76	0.40–7.71	.451	—	0	—	—	—	—	2	0.31	−0.50–1.13	.451	—
Seeking nonpsychiatric help	1	1.29	0.23–7.22	.769	—	0	—	—	—	—	1	0.14	−0.80–1.09	.769	—
Not seeking nonpsychiatric help	3	1.10	0.35–3.50	.869	—	0	—	—	—	—	3	0.05	−0.58–0.69	.869	—
PTSD assessment did not reference a specific PTE	0	—	—	—	—	0	—	—	—	—	0	—	—	—	—
PTSD assessment referenced this specific PTE	2	1.87	0.80–4.35	.146	—	0	—	—	—	—	2	0.34	−0.12–0.81	.146	—
PTSD assessment referenced the worst-ever PTE	2	0.60	0.24–1.46	.260	—	0	—	—	—	—	2	−0.28	−0.78–0.21	.260	—
Prospective	0	—	—	—	—	0	—	—	—	—	0	—	—	—	—
Retrospective	4	1.10	0.46–2.59	.832	—	0	—	—	—	—	4	0.05	−0.42–0.52	.832	—
Epidemiological sample	3	1.10	0.35–3.50	.869	—	0	—	—	—	—	3	0.05	−0.58–0.69	.869	—
Convenience sample	1	1.29	0.23–7.22	.769	—	0	—	—	—	—	1	0.14	−0.80–1.09	.769	—
Prisoner/homeless	1	1.29	0.23–7.22	.769	—	0	—	—	—	—	1	0.14	−0.80–1.09	.769	—
Not Prisoner/homeless	3	1.10	0.35–3.50	.869	—	0	—	—	—	—	3	0.05	−0.58–0.69	.869	—
<i>Child sexual abuse</i>															
All samples	7	1.71	0.91–3.21	.093	—	3	−1.02	−3.99–1.95	.502	—	10	−0.17	−1.43–1.09	.791	—
Adults	1	2.59	1.27–5.30	.009	—	0	—	—	—	—	1	0.52	0.13–0.92	.009	—
Adolescents	4	1.23	0.51–2.95	.650	—	1	−3.68	−3.95–−3.48	<.001	—	5	−0.88	−3.04–1.28	.424	—
Children	2	2.72	0.75–9.87	.128	—	2	0.29	−0.26–0.85	.300	—	4	0.32	−0.01–0.65	.058	—
Adolescents and children	6	1.46	0.73–2.94	.287	—	3	−1.02	−3.99–1.95	.502	—	9	−0.25	−1.65–1.15	.725	—
Interview	4	2.73	1.59–4.68	<.001	9	2	0.29	−0.26–0.85	.300	—	6	0.43	0.20–0.66	<.001	16
Questionnaire	3	0.89	0.58–1.37	.592	—	1	−3.68	−3.95–−3.48	<.001	—	4	−1.28	−3.82–1.27	.326	—
Life threat and extreme fear	0	—	—	—	—	1	0.61	0.02–1.20	.043	—	1	0.61	0.02–1.20	.043	—
Neither threat nor fear	7	1.71	0.91–3.21	.093	—	2	−1.82	−5.47–1.82	.327	—	9	−0.26	−1.62–1.10	.707	—
Lifetime	1	2.59	1.27–5.30	.009	—	0	—	—	—	—	1	0.52	0.13–0.92	.009	—
Current	6	1.46	0.73–2.94	.287	—	3	−1.02	−3.99–1.95	.502	—	9	−0.25	−1.65–1.15	.725	—
Seeking nonpsychiatric help	3	2.92	1.29–6.62	.010	2	0	—	—	—	—	3	0.59	0.14–1.04	.010	2
Not seeking nonpsychiatric help	4	1.26	0.54–2.94	.597	—	3	−1.02	−3.99–1.95	.502	—	7	−0.54	−2.10–1.03	.503	—
PTSD assessment did not reference a specific PTE	0	—	—	—	—	0	—	—	—	—	0	—	—	—	—
PTSD assessment referenced this specific PTE	4	1.75	0.76–4.03	.191	—	2	0.29	−0.26–0.85	.300	—	6	0.27	−0.03–0.58	.081	—
PTSD assessment referenced the worst-ever PTE	3	1.72	0.52–5.64	.371	—	1	−3.68	−3.95–−3.41	<.001	—	4	−1.11	−4.00–1.77	.449	—
Prospective	0	—	—	—	—	1	0.04	−0.42–0.50	.864	—	1	0.04	−0.42–0.50	.864	—
Retrospective	7	1.71	0.91–3.21	.093	—	2	−1.54	−5.75–2.66	.472	—	9	−0.19	−1.61–1.22	.789	—
Epidemiological sample	3	1.72	0.52–5.64	.371	—	1	0.04	−0.42–0.50	.864	—	4	0.23	−0.18–0.64	.274	—
Convenience sample	4	1.75	0.76–4.03	.191	—	2	−1.54	−5.75–2.66	.472	—	6	−0.20	−2.04–1.64	.833	—
Prisoner/homeless	0	—	—	—	—	0	—	—	—	—	0	—	—	—	—
Not prisoner/homeless	7	1.71	0.91–3.21	.093	—	3	−1.02	−3.99–1.95	.502	—	10	−0.17	−1.43–1.09	.791	—

Table 4 (continued)

Analysis	Diagnosis					Severity					Combined				
	<i>k</i>	OR	95% CI	<i>p</i>	FSN	<i>k</i>	<i>d</i>	95% CI	<i>p</i>	FSN	<i>k</i>	<i>d</i>	95% CI	<i>p</i>	FSN
<i>Nonsexual child abuse or neglect</i>															
All samples	7	1.43	0.62–3.26	.400	—	1	−0.04	−0.78–0.70	.916	—	8	0.16	−0.24–0.56	.443	—
Adults	3	2.08	0.62–6.99	.239	—	0	—	—	—	—	3	0.40	−0.27–1.07	.239	—
Adolescents	2	3.65	0.48–27.62	.209	—	0	—	—	—	—	2	0.71	−0.40–1.83	.209	—
Children	2	0.59	0.30–1.15	.118	—	1	−0.04	−0.78–0.70	.916	—	3	−0.25	−0.57–0.06	.115	—
Adolescents and children	4	0.80	0.35–1.81	.592	—	1	−0.04	−0.78–0.70	.916	—	5	−0.17	−0.49–0.16	.311	—
Interview	3	1.08	0.31–3.69	.907	—	1	−0.04	−0.78–0.70	.916	—	4	0.03	−0.53–0.58	.926	—
Questionnaire	4	1.62	0.66–3.97	.292	—	0	—	—	—	—	4	0.27	−0.23–0.76	.292	—
Life threat and extreme fear	0	—	—	—	—	0	—	—	—	—	0	—	—	—	—
Neither threat nor fear	7	1.43	0.62–3.26	.400	—	1	−0.04	−0.78–0.70	.916	—	8	0.16	−0.24–0.56	.443	—
Lifetime	3	2.08	0.62–6.99	.239	—	0	—	—	—	—	3	0.40	−0.27–1.07	.239	—
Current	4	0.80	0.35–1.81	.592	—	1	−0.04	−0.78–0.70	.916	—	5	−0.17	−0.49–0.16	.311	—
Seeking nonpsychiatric help	1	0.46	0.21–0.99	.047	—	0	—	—	—	—	1	−0.43	−0.86–0.01	.047	—
Not seeking nonpsychiatric help	6	1.83	0.83–4.04	.134	—	1	−0.04	−0.78–0.70	.916	—	7	0.27	−0.11–0.65	.160	—
PTSD assessment did not reference a specific PTE	1	0.94	0.31–2.83	.911	—	0	—	—	—	—	1	−0.03	−0.64–0.57	.911	—
PTSD assessment referenced this specific PTE	2	1.35	0.10–17.50	.818	—	1	−0.04	−0.78–0.70	.916	—	3	−0.03	−0.70–0.64	.926	—
PTSD assessment referenced the worst-ever PTE	4	1.96	0.68–5.61	.212	—	0	—	—	—	—	3	0.37	−0.21–0.95	.212	—
Prospective	1	6.52	0.61–69.21	.120	—	1	−0.04	−0.78–0.70	.916	—	2	0.36	−0.66–1.37	.490	—
Retrospective	6	1.24	0.53–2.94	.617	—	0	—	—	—	—	6	0.12	−0.35–0.60	.617	—
Epidemiological sample	4	1.96	0.68–5.61	.212	—	1	−0.04	−0.78–0.70	.916	—	5	0.28	−0.20–0.76	.249	—
Convenience sample	3	0.92	0.30–2.82	.886	—	0	—	—	—	—	3	−0.04	−0.66–0.57	.886	—
Prisoner/homeless	0	—	—	—	—	0	—	—	—	—	0	—	—	—	—
Not prisoner/homeless	7	1.43	0.62–3.26	.400	—	1	−0.04	−0.78–0.70	.916	—	8	0.16	−0.24–0.56	.443	—
<i>Accidents</i>															
All samples	40	1.81	1.51–2.17	<.001	873 ^a	4	0.29	0.12–0.47	.001	9	44	0.32	0.23–0.42	<.001	1094 ^a
Adults	31	1.71	1.40–2.09	<.001	505 ^a	2	0.20	−0.02–0.41	.080	—	33	0.29	0.18–0.39	<.001	565 ^a
Adolescents	4	2.34	1.09–5.01	.028	5	1	0.64	−0.17–1.45	.121	—	5	0.52	0.18–0.85	.003	9
Children	5	2.49	1.61–3.86	<.001	13	1	0.44	0.13–0.75	.005	—	6	0.48	0.29–0.67	<.001	26
Adolescents and children	9	2.53	1.77–3.60	<.001	41	2	0.46	0.18–0.75	.002	—	11	0.50	0.34–0.66	<.001	76 ^a
Interview	30	2.04	1.65–2.54	<.001	564 ^a	2	0.20	−0.02–0.41	.080	—	32	0.38	0.26–0.48	<.001	627 ^a
Questionnaire	10	1.36	0.98–1.90	.068	—	2	0.46	0.18–0.75	.002	—	12	0.22	0.05–0.38	.011	54
Life threat and extreme fear	1	3.09	1.21–7.89	.018	—	0	—	—	—	—	1	0.62	0.11–1.14	.018	—
Neither threat nor fear	37	1.83	1.50–2.24	<.001	701 ^a	4	0.29	0.12–0.47	.001	9	41	0.33	0.23–0.43	<.001	901 ^a
Lifetime	4	2.21	1.44–3.39	<.001	22	0	—	—	—	—	4	0.44	0.20–0.67	<.001	22
Current	36	1.76	1.44–2.14	<.001	598 ^a	4	0.29	0.12–0.47	.001	9	40	0.31	0.21–0.41	<.001	784 ^a
Seeking nonpsychiatric help	29	1.74	1.40–2.18	<.001	424 ^a	3	0.22	0.01–0.44	.036	2	32	0.30	0.19–0.41	<.001	514 ^a
Not seeking nonpsychiatric help	11	2.05	1.56–2.70	<.001	69 ^a	1	0.44	0.13–0.75	.005	—	12	0.40	0.27–0.53	<.001	96 ^a
PTSD assessment did not reference a specific PTE	0	—	—	—	—	0	—	—	—	—	0	—	—	—	—
PTSD assessment referenced this specific PTE	35	1.80	1.47–2.21	<.001	661 ^a	4	0.29	0.12–0.47	.001	9	39	0.32	0.22–0.42	<.001	855 ^a
PTSD assessment referenced the worst-ever PTE	5	1.81	1.30–2.51	<.001	10	0	—	—	—	—	5	0.33	0.14–0.51	<.001	10
Prospective	23	1.73	1.34–2.23	<.001	276 ^a	3	0.28	0.10–0.45	.002	5	26	0.30	0.17–0.42	<.001	375 ^a
Retrospective	17	1.91	1.50–2.42	<.001	151 ^a	1	0.64	−0.17–1.45	.121	—	18	0.36	0.23–0.49	<.001	171 ^a

(table continues)

Table 4 (continued)

Analysis	Diagnosis					Severity					Combined				
	<i>k</i>	OR	95% CI	<i>p</i>	FSN	<i>k</i>	<i>d</i>	95% CI	<i>p</i>	FSN	<i>k</i>	<i>d</i>	95% CI	<i>p</i>	FSN
<i>Epidemiological sample</i>															
sample	8	1.96	1.50–4.92	<.001	39	0	—	—	—	—	8	0.37	0.22–0.52	<.001	39
Convenience sample	32	1.77	1.43–2.20	<.001	517 ^a	4	0.29	0.12–0.47	.001	9	36	0.31	0.21–0.42	<.001	690 ^a
Prisoner/homeless	1	2.61	0.97–7.02	.057	—	0	—	—	—	—	1	0.53	–0.02–1.07	.057	—
Not prisoner/homeless	39	1.80	1.49–2.16	<.001	816 ^a	4	0.29	0.12–0.47	.001	9	43	0.32	0.23–0.41	<.001	1,030 ^a
<i>Event occurred after age 18</i>															
Event occurred after age 18	26	1.61	1.28–2.03	<.001	271 ^a	2	0.20	–0.02–0.41	.080	—	28	0.26	0.14–0.37	<.001	316 ^a
<i>Event occurred before age 18</i>															
Event occurred before age 18	11	2.62	1.96–3.52	<.001	84 ^a	2	0.46	0.18–0.75	.002	—	13	0.51	0.38–0.66	<.001	130 ^a
<i>Unknown or mixed age at time of event</i>															
Unknown or mixed age at time of event	3	1.90	1.25–2.87	.002	8	0	—	—	—	—	3	0.35	0.12–0.58	.002	8
<i>Nonsexual assault</i>															
<i>All samples</i>															
All samples	19	4.11	2.37–7.13	<.001	661 ^a	6	0.30	0.03–0.57	.031	16	25	0.65	0.41–0.90	<.001	916 ^a
Adults	15	4.72	2.47–9.02	<.001	484 ^a	1	0.30	0.06–0.54	.014	—	16	0.81	0.46–1.16	<.001	540 ^a
Adolescents	3	2.89	1.19–6.98	.019	1	1	0.85	0.32–1.38	.002	—	4	0.71	0.35–1.06	<.001	8
Children	1	1.95	1.38–2.76	<.001	—	4	0.17	–0.21–0.55	.374	—	5	0.23	–0.02–0.48	.073	—
<i>Adolescents and children</i>															
Adolescents and children	4	2.05	1.49–2.84	<.001	11	5	0.31	–0.08–0.71	.124	—	9	0.35	0.13–0.58	.002	42
Interview	14	4.79	2.37–9.70	<.001	416 ^a	3	0.21	–0.51–0.93	.564	—	17	0.74	0.38–1.11	<.001	458 ^a
Questionnaire	5	2.22	1.65–3.00	<.001	24	3	0.33	0.03–0.63	.031	10	8	0.40	0.22–0.58	<.001	72 ^a
<i>Life threat and extreme fear</i>															
Life threat and extreme fear	1	2.20	0.62–7.79	.221	—	2	0.31	0.08–0.54	.009	—	3	0.32	0.10–0.54	.004	3
<i>Neither threat nor fear</i>															
Neither threat nor fear	22	4.25	2.39–7.56	<.001	630 ^a	4	0.85	–0.15–0.73	.195	—	26	0.69	0.41–0.97	<.001	781 ^a
<i>Lifetime</i>															
Lifetime	6	13.07	5.80–29.45	<.001	226 ^a	0	—	—	—	—	6	1.42	0.97–1.86	<.001	226 ^a
<i>Current</i>															
Current	13	2.22	1.75–2.83	<.001	105 ^a	6	0.30	0.03–0.57	.031	16	19	0.39	0.25–0.53	<.001	221 ^a
<i>Seeking nonpsychiatric help</i>															
Seeking nonpsychiatric help	2	2.34	1.24–4.42	.008	—	0	—	—	—	—	2	0.47	0.12–0.82	.008	—
<i>Not seeking nonpsychiatric help</i>															
Not seeking nonpsychiatric help	17	4.43	2.38–8.22	<.001	571 ^a	6	0.30	0.03–0.57	.031	16	23	0.67	0.41–0.93	<.001	810 ^a
<i>PTSD assessment did not reference a specific PTE</i>															
PTSD assessment did not reference a specific PTE	0	—	—	—	—	0	—	—	—	—	0	—	—	—	—
<i>PTSD assessment referenced this specific PTE</i>															
PTSD assessment referenced this specific PTE	12	3.62	1.79–7.32	<.001	168 ^a	5	0.36	–0.01–0.74	.057	—	17	0.60	0.30–0.89	<.001	283 ^a
<i>PTSD assessment referenced the worst-ever PTE</i>															
PTSD assessment referenced the worst-ever PTE	7	4.91	1.84–13.13	.002	154 ^a	1	0.12	–0.05–0.29	.168	—	8	0.76	0.31–1.22	.001	171 ^a
Prospective	4	2.37	1.32–4.22	.004	7	2	0.12	–0.87–1.11	.815	—	6	0.37	–0.01–0.75	.056	—
Retrospective	15	4.48	2.33–8.64	<.001	505 ^a	4	0.33	0.06–0.60	.017	13	19	0.73	0.44–1.02	<.001	701 ^a
<i>Epidemiological sample</i>															
sample	9	8.76	4.14–18.50	<.001	282 ^a	2	0.12	–0.87–1.11	.815	—	11	0.92	0.43–1.40	<.001	300 ^a
Convenience sample	10	2.17	1.69–2.79	<.001	72 ^a	4	0.33	0.06–0.60	.017	13	14	0.39	0.24–0.53	<.001	157 ^a
Prisoner/homeless	1	2.40	1.15–4.98	.019	—	0	—	—	—	—	1	0.48	0.08–0.88	.019	—
Not prisoner/homeless	18	4.26	2.36–7.69	<.001	601 ^a	6	0.30	0.03–0.57	.031	16	24	0.66	0.41–0.92	<.001	846 ^a
<i>Event occurred after age 18</i>															
Event occurred after age 18	8	4.06	1.65–10.03	.002	107 ^a	1	0.30	0.06–0.54	.014	—	9	0.70	0.25–1.16	.002	135 ^a
<i>Event occurred before age 18</i>															
Event occurred before age 18	4	2.05	1.49–2.84	<.001	11	5	0.31	–0.08–0.71	.124	—	9	0.35	0.13–0.58	.002	42
<i>Unknown or mixed age at time of event</i>															
Unknown or mixed age at time of event	7	5.55	1.99–15.45	.001	128 ^a	0	—	—	—	—	7	0.94	0.38–1.51	.001	128 ^a
<i>Combat, war, or terrorism</i>															
<i>All samples</i>															
All samples	60	1.33	1.16–1.53	<.001	734 ^a	36	0.20	0.12–0.28	<.001	905 ^a	96	0.18	0.12–0.23	<.001	3,367 ^a
Veterans	11	1.14	0.82–1.61	.435	—	7	0.27	–0.08–0.62	.134	—	18	0.16	–0.01–0.32	.059	—
Civilians	48	1.38	1.17–1.63	<.001	519 ^a	29	0.19	0.11–0.27	<.001	577 ^a	77	0.18	0.12–0.24	<.001	2,267 ^a
Adults	39	1.36	1.13–1.64	.001	277 ^a	20	0.17	–0.01–0.35	.068	—	59	0.18	0.09–0.27	<.001	774 ^a
Adolescents	12	1.55	1.21–1.98	<.001	65	10	0.22	0.10–0.34	<.001	67 ^a	22	0.23	0.14–0.32	<.001	284 ^a
Children	9	1.11	0.83–1.49	.473	—	6	0.23	0.14–0.32	<.001	112 ^a	15	0.16	0.08–0.25	<.001	142 ^a
<i>Adolescents and children</i>															
Adolescents and children	21	1.33	1.08–1.63	.006	88	16	0.23	0.16–0.30	<.001	368 ^a	37	0.20	0.14–0.26	<.001	863 ^a
Interview	25	1.08	0.87–1.32	.501	—	5	–0.05	–0.37–0.26	.743	—	30	0.03	–0.08–0.13	.627	—
Questionnaire	35	1.54	1.32–1.18	<.001	667 ^a	31	0.23	0.14–0.31	<.001	947 ^a	66	0.24	0.18–0.30	<.001	3,269 ^a
<i>Life threat and extreme fear</i>															
Life threat and extreme fear	4	1.67	0.70–3.94	.244	—	2	0.30	0.22–0.36	<.001	—	6	0.31	0.08–0.53	.008	46 ^a

Table 4 (continued)

Analysis	Diagnosis					Severity					Combined				
	<i>k</i>	OR	95% CI	<i>p</i>	FSN	<i>k</i>	<i>d</i>	95% CI	<i>p</i>	FSN	<i>k</i>	<i>d</i>	95% CI	<i>p</i>	FSN
Neither threat nor fear	53	1.34	1.15–1.55	<.001	657 ^a	34	0.18	0.09–0.28	<.001	618 ^a	87	0.17	0.11–0.23	<.001	2,634 ^a
Lifetime	5	0.98	0.80–1.20	.841	—	2	0.00	–0.21–0.22	.960	—	7	0.00	–0.08–0.67	.895	—
Current	56	1.37	1.18–1.59	<.001	715 ^a	34	0.21	0.12–0.29	<.001	900 ^a	90	0.19	0.13–0.25	<.001	3,309 ^a
Seeking nonpsychiatric help	13	1.32	0.81–2.14	.267	—	6	0.32	0.09–0.54	.007	123 ^a	19	0.22	0.05–0.39	.013	186 ^a
Not seeking nonpsychiatric help	47	1.35	1.16–1.56	<.001	588 ^a	30	0.17	0.08–0.26	<.001	345 ^a	44	0.16	0.10–0.22	<.001	1,907 ^a
PTSD assessment did not reference a specific PTE	10	1.14	0.75–1.73	.538	—	7	0.17	–0.01–0.36	.064	—	17	0.12	–0.01–0.26	.071	—
PTSD assessment referenced this specific PTE	50	1.37	1.17–1.60	<.001	645 ^a	29	0.20	0.10–0.30	<.001	546 ^a	79	0.19	0.12–0.25	<.001	2,454 ^a
PTSD assessment referenced the worst-ever PTE	0	—	—	—	—	0	—	—	—	—	0	—	—	—	—
Prospective	9	1.27	0.73–2.23	.401	—	3	–0.14	–0.39–0.11	.276	—	12	0.01	–0.20–0.22	.927	—
Retrospective	51	1.34	1.16–1.55	<.001	652 ^a	33	0.23	0.14–0.31	<.001	977 ^a	84	0.19	0.13–0.25	<.001	3,312 ^a
Epidemiological sample	9	1.59	1.29–1.97	<.001	224 ^a	4	0.43	0.23–0.64	<.001	130 ^a	13	0.32	0.22–0.42	<.001	707 ^a
Convenience sample	51	1.26	1.05–1.50	.013	116 ^a	32	0.15	0.06–0.24	.001	333 ^a	83	0.13	0.06–0.20	<.001	942 ^a
Prisoner/homeless	0	—	—	—	—	0	—	—	—	—	0	—	—	—	—
Not prisoner/homeless	60	1.33	1.16–1.53	<.001	734 ^a	36	0.20	0.12–0.28	<.001	905 ^a	96	0.18	0.12–0.23	<.001	3,367 ^a
Event occurred after age 18	31	1.42	1.17–1.72	<.001	251 ^a	18	0.18	0.00–0.36	.054	—	49	0.20	0.10–0.29	<.001	661 ^a
Event occurred before age 18	22	1.22	0.94–1.59	.128	—	15	0.25	0.18–0.32	<.001	408 ^a	37	0.18	0.10–0.25	<.001	803 ^a
Unknown or mixed age at time of event	7	1.37	0.83–2.26	.218	—	3	–0.26	–1.12–0.59	.544	—	10	0.09	–0.14–0.33	.453	—
<i>Disaster or fire</i>															
All samples	37	2.11	1.79–2.50	<.001	1,324 ^a	24	0.40	0.07–0.72	.018	669 ^a	61	0.42	0.28–0.56	<.001	3,935 ^a
Adults	31	2.09	1.70–2.57	<.001	784 ^a	6	0.45	0.20–0.70	<.001	50 ^a	37	0.42	0.31–0.52	<.001	1,258 ^a
Adolescents	5	1.97	1.61–2.42	<.001	45 ^a	12	0.52	–0.15–1.20	.128	—	17	0.53	0.10–0.95	.014	551 ^a
Children	1	2.49	1.21–5.12	.013	—	6	0.12	–0.16–0.40	.414	—	7	0.18	–0.07–0.44	.164	—
Adolescents and children	6	2.01	1.65–2.44	<.001	64 ^a	18	0.37	–0.06–0.81	.093	—	24	0.41	0.11–0.72	.008	718 ^a
Children															
Interview	19	1.88	1.41–2.51	<.001	167 ^a	9	0.46	–0.56–1.48	.372	—	28	0.40	0.07–0.73	.018	668 ^a
Questionnaire	18	2.31	2.01–2.65	<.001	523 ^a	15	0.32	0.16–0.49	<.001	170 ^a	33	0.40	0.30–0.50	<.001	1,324 ^a
Life threat and extreme fear	3	2.59	1.18–5.70	.018	4	2	1.92	–0.82–4.68	.170	—	5	1.13	–0.35–2.61	.134	—
Neither threat nor fear	32	2.05	1.71–2.46	<.001	931 ^a	18	0.31	0.15–0.46	<.001	181 ^a	50	0.36	0.28–0.45	<.001	1,985 ^a
Lifetime	4	1.54	0.43–5.51	.510	—	0	—	—	—	—	4	0.24	–0.47–0.94	.510	—
Current	33	2.13	1.81–2.52	<.001	1,224 ^a	24	0.40	0.07–0.72	.018	669 ^a	57	0.42	0.28–0.57	<.001	3,759 ^a
Seeking nonpsychiatric help	5	1.60	0.84–3.01	.150	—	2	0.38	–0.32–1.09	.286	—	7	0.30	0.01–0.58	.040	8
Not seeking nonpsychiatric help	32	2.17	1.82–2.58	<.001	1,152 ^a	22	0.40	0.05–0.74	.025	604 ^a	54	0.43	0.28–0.58	<.001	3,476 ^a
PTSD assessment did not reference a specific PTE	2	1.61	0.80–3.23	.182	—	0	—	—	—	—	2	0.26	–0.12–0.65	.182	—
PTSD assessment referenced this specific PTE	33	2.14	1.79–2.56	<.001	1,102 ^a	24	0.40	0.07–0.72	.018	669 ^a	57	0.41	0.27–0.56	<.001	3,545 ^a
PTSD assessment referenced the worst-ever PTE	2	2.53	0.71–0.90	.154	—	0	—	—	—	—	2	0.51	–0.19–1.21	.154	—
Prospective	6	2.16	1.57–2.98	<.001	24	2	0.09	–0.11–0.28	.389	—	8	0.28	0.09–0.46	.003	29
Retrospective	31	2.12	1.76–2.56	<.001	960 ^a	22	0.43	0.06–0.80	.025	640 ^a	53	0.43	0.27–0.59	<.001	3,217 ^a
Epidemiological sample	15	2.03	1.46–2.83	<.001	165 ^a	7	0.66	–0.39–1.71	.216	—	22	0.46	0.10–0.83	.013	818 ^a
Convenience sample	22	2.17	1.89–2.48	<.001	529 ^a	17	0.24	0.10–0.38	.001	99 ^a	39	0.34	0.25–0.43	<.001	1,134 ^a
Prisoner/homeless	0	—	—	—	—	0	—	—	—	—	0	—	—	—	—
Not prisoner/homeless	37	2.11	1.79–2.50	<.001	1,324 ^a	24	0.40	0.07–0.72	.018	669 ^a	61	0.42	0.28–0.56	<.001	3,935 ^a

(table continues)

Table 4 (continued)

Analysis	Diagnosis					Severity					Combined				
	<i>k</i>	OR	95% CI	<i>p</i>	FSN	<i>k</i>	<i>d</i>	95% CI	<i>p</i>	FSN	<i>k</i>	<i>d</i>	95% CI	<i>p</i>	FSN
Event occurred after age 18	25	2.05	1.60–2.61	<.001	469 ^a	6	0.45	0.20–0.70	<.001	50 ^a	31	0.41	0.29–0.52	<.001	848 ^a
Event occurred before age 18	10	2.06	1.74–2.45	<.001	157 ^a	18	0.37	–0.06–0.81	.093	—	28	0.44	0.17–0.70	.001	982 ^a
Unknown or mixed age at time of event	2	2.40	0.68–8.54	.176	—	0	—	—	—	—	2	0.48	–0.22–1.18	.176	—
<i>Witnessing death or injury</i>															
All samples	5	1.51	1.22–1.88	<.001	167 ^a	10	0.29	0.19–0.38	<.001	84 ^a	35	0.25	0.17–0.34	<.001	517 ^a
Adults	16	1.39	1.06–1.84	.018	46	5	0.30	0.18–0.43	<.001	28	21	0.22	0.11–0.34	<.001	163 ^a
Adolescents	3	3.28	1.55–6.96	.002	6	3	0.42	0.14–0.70	.003	5	6	0.49	0.26–0.72	<.001	27
Children	6	1.55	1.10–2.18	.011	3	2	0.18	–0.03–0.38	.092	—	8	0.21	0.07–0.35	.003	11
Adolescents and children	9	1.76	1.29–2.40	<.001	27	5	0.26	0.10–0.43	.002	11	14	0.29	0.17–0.40	<.001	85 ^a
Interview	15	1.25	0.94–1.66	.133	—	0	—	—	—	—	15	0.12	–0.04–0.28	.133	—
Questionnaire	10	1.95	1.46–2.59	<.001	75 ^a	10	0.29	0.19–0.38	<.001	84 ^a	20	0.32	0.23–0.40	<.001	337 ^a
Life threat and extreme fear	0	—	—	—	—	0	—	—	—	—	0	—	—	—	—
Neither threat nor fear	23	1.54	1.20–1.97	.001	127 ^a	10	0.29	0.19–0.38	<.001	84 ^a	33	0.26	0.17–0.35	<.001	446 ^a
Lifetime	10	1.22	0.82–1.82	.334	—	0	—	—	—	—	10	0.11	–0.11–0.33	.334	—
Current	15	1.70	1.35–2.14	<.001	98 ^a	10	0.29	0.19–0.38	<.001	84 ^a	25	0.29	0.21–0.36	<.001	385 ^a
Seeking nonpsychiatric help	5	1.45	1.05–2.00	.023	1	3	0.28	0.10–0.45	.002	10	8	0.25	0.15–0.36	<.001	28
Not seeking nonpsychiatric help	20	1.55	1.18–2.04	.002	111 ^a	7	0.30	0.16–0.44	<.001	30	27	0.27	0.15–0.38	<.001	280 ^a
PTSD assessment did not reference a specific PTE	1	2.34	0.84–6.50	.104	—	2	0.34	0.08–0.61	.011	—	3	0.37	0.13–0.60	.003	4
PTSD assessment referenced this specific PTE	22	1.52	1.18–1.98	.001	115 ^a	7	0.31	0.20–0.43	<.001	46	29	0.26	0.16–0.37	<.001	331 ^a
PTSD assessment referenced the worst-ever PTE	2	1.33	0.97–1.83	.076	—	1	0.15	–0.08–0.38	.201	—	3	0.16	0.02–0.29	.029	1
Prospective	4	1.93	1.20–3.11	.007	14	3	0.38	0.21–0.56	<.001	9	7	0.36	0.21–0.52	<.001	50 ^a
Retrospective	21	1.42	1.11–1.80	.005	74	7	0.25	0.14–0.36	<.001	33	28	0.22	0.12–0.31	<.001	227 ^a
Epidemiological sample	10	1.14	0.76–1.71	.518	—	0	—	—	—	—	10	0.07	–0.15–0.29	.518	—
Convenience sample	15	1.77	1.45–2.16	<.001	115 ^a	10	0.29	0.19–0.38	<.001	84 ^a	25	0.30	0.23–0.37	<.001	417 ^a
Prisoner/homeless	0	—	—	—	—	0	—	—	—	—	0	—	—	—	—
Not prisoner/homeless	25	1.51	1.22–1.88	<.001	167 ^a	10	0.29	0.19–0.38	<.001	84 ^a	35	0.25	0.17–0.34	<.001	517 ^a
Event occurred after age 18	16	1.43	1.06–1.91	.018	47	5	0.30	0.18–0.43	<.001	28	21	0.24	0.12–0.35	<.001	164 ^a
Event occurred before age 18	8	1.76	1.48–2.42	.001	23	5	0.26	0.10–0.43	.002	11	13	0.28	0.16–0.41	<.001	78 ^a
Unknown or mixed age at time of event	1	1.19	0.77–1.83	.441	—	0	—	—	—	—	1	0.09	–0.14–0.33	.441	—
<i>Illness or unspecified injury</i>															
All samples	26	1.46	1.11–1.91	.007	56	9	0.30	0.09–0.51	.005	20	35	0.24	0.12–0.36	<.001	170
Adults	20	1.44	1.05–1.98	.023	24	9	0.30	0.09–0.51	.005	20	29	0.24	0.11–0.38	<.001	113
Adolescents	2	3.32	1.05–10.52	.041	—	0	—	—	—	—	2	0.66	0.03–1.30	.041	—
Children	4	1.10	0.66–1.85	.717	—	0	—	—	—	—	4	0.05	–0.23–0.34	.717	—
Adolescents and children	6	1.49	0.82–2.70	.185	—	0	—	—	—	—	6	0.22	–0.11–0.55	.185	—
Interview	16	1.57	1.10–2.24	.013	20	1	–0.87	–2.16–0.42	.187	—	17	0.23	0.02–0.43	.028	11
Questionnaire	10	1.35	0.86–2.13	.193	—	8	0.33	0.14–0.52	.001	28	18	0.25	0.09–0.41	.002	65
Life threat and extreme fear	4	1.47	0.72–3.03	.290	—	0	—	—	—	—	4	0.21	–0.18–0.61	.290	—
Neither threat nor fear	22	1.46	1.08–1.99	.015	33	9	0.30	0.09–0.51	.005	20	31	0.25	0.12–0.38	<.001	131
Lifetime	1	0.83	0.02–36.30	.924	—	0	—	—	—	—	1	–0.10	–2.18–1.98	.924	—
Current	25	1.47	1.11–1.93	.007	58	9	0.30	0.09–0.51	.005	20	34	0.24	0.12–0.37	<.001	173
Seeking nonpsychiatric help	23	1.52	1.18–1.96	.001	67	9	0.30	0.09–0.51	.005	20	32	0.26	0.15–0.38	<.001	186

Table 4 (continued)

Analysis	Diagnosis					Severity					Combined				
	<i>k</i>	OR	95% CI	<i>p</i>	FSN	<i>k</i>	<i>d</i>	95% CI	<i>p</i>	FSN	<i>k</i>	<i>d</i>	95% CI	<i>p</i>	FSN
Not seeking nonpsychiatric help	3	0.91	0.22–3.77	.896	—	0	—	—	—	—	3	−0.05	−0.84–0.73	.896	—
PTSD assessment did not reference a specific PTE	0	—	—	—	—	0	—	—	—	—	0	—	—	—	—
PTSD assessment referenced this specific PTE	24	1.49	1.11–2.01	.008	47	9	0.30	0.09–0.51	.005	20	33	0.25	0.12–0.38	<.001	156
PTSD assessment referenced the worst-ever PTE	2	1.29	0.50–3.30	.595	—	0	—	—	—	—	2	0.14	−0.38–0.66	.595	—
Prospective	18	1.79	1.27–2.52	.001	57	6	0.43	0.21–0.65	<.001	24	24	0.36	0.21–0.51	<.001	176
Retrospective	8	0.97	0.68–1.37	.850	—	3	0.05	−0.25–0.36	.736	—	11	0.01	−0.14–0.16	.924	—
Epidemiological sample	2	2.32	0.58–9.29	.235	—	0	—	—	—	—	2	0.46	−0.30–1.23	.235	—
Convenience sample	24	1.44	1.09–1.91	.011	47	9	0.30	0.09–0.51	.005	20	33	0.24	0.11–0.36	<.001	155
Prisoner/homeless	0	—	—	—	—	0	—	—	—	—	0	—	—	—	—
Not prisoner/homeless	26	1.46	1.11–1.91	.007	56	9	0.30	0.09–0.51	.005	20	35	0.24	0.12–0.36	<.001	170
Event occurred after age 18	16	1.53	1.03–2.26	.034	19	9	0.30	0.09–0.51	.005	20	25	0.26	0.11–0.41	.001	100
Event occurred before age 18	8	1.31	0.85–2.04	.223	—	0	—	—	—	—	8	0.15	−0.09–0.39	.223	—
Unknown or mixed age at time of event	2	1.11	0.62–2.01	.727	—	0	—	—	—	—	2	0.06	−0.27–0.38	.727	—

Note. Mean DerSimonian–Laird odds ratio (OR) values less than 1.0 indicate a greater probability of PTSD among male participants than among female participants; OR values greater than 1.0 indicate a greater probability of PTSD among female participants than among male participants. Effect size (*d*) values less than 0.0 indicate a greater severity of PTSD symptoms among male participants than among female participants; *d* values greater than 0.0 indicate a greater severity of PTSD symptoms among female participants than among male participants. PTSD = posttraumatic stress disorder; PTE = potentially traumatic event; *k* = number of studies; CI = confidence interval; FSN = fail-safe *N*.

^a Finding is robust against the file-drawer effect (FSN > 5*k* + 10).

and convenience-sample studies showed a significant sex difference (with more PTSD among female participants), the sex difference was significantly greater in epidemiological samples.

Disaster or fire. Sixty-one comparisons reported PTSD in male and female participants who reported experiencing disaster or fire. As shown in Table 4, a significantly and robustly higher frequency of PTSD was found for female participants than for male participants across 37 dichotomous studies (OR = 2.11, 95% CI = 1.79–2.50) and a higher severity of PTSD was found for female participants across 24 continuous-measure studies (*d* = 0.40, 95% CI = 0.07–0.72). The pooled studies, similarly, were consistent with significantly and robustly greater PTSD among female participants (*d* = 0.42, 95% CI = 0.28–0.56). Table 4 shows that for the pooled studies (right columns), the sex difference favoring female participants was significant across most methodological variables; it was not significant in samples of children, when *DSM-IV* Criteria A1 and A2 were used, for studies of lifetime PTSD, when the PTSD assessment was not linked to any specific PTE or was linked to the worst-ever event, or when participants' age at the time of the event was not specified. In each of these cases, however, we note that the number of studies was small, with a wide confidence interval.

Witnessing death or injury. We obtained 35 comparisons reporting PTSD among male and female participants who witnessed the death or injury of another person. Twenty-five studies showed a higher frequency of PTSD among female participants than among male participants (OR = 1.51, 95% CI = 1.22–1.88), and

10 additional studies showed a greater severity of PTSD symptoms among female participants (*d* = 0.29, 95% CI = 0.19–0.38). The 35 pooled studies also showed a similar effect (*d* = 0.25, 95% CI = 0.17–0.34). Table 4 shows that among the pooled studies, this sex difference remained significant and robust in most cases; no significant sex difference was found, however, when an interview was used, when lifetime PTSD was assessed, in epidemiological samples, or when the age at the time of the event was not known. Furthermore, among help-seeking samples and when the PTSD assessment was not linked to any specific PTE, the sex difference was significant but not robust against the file-drawer effect.

Illness or unspecified injury. Thirty-five comparisons described PTSD secondary to illness or unspecified injury. As described earlier, injuries were included in this category only if the cause of the injury (e.g., motor vehicle accident, disaster, or assault) was not specified. The 26 comparisons of the frequency of PTSD yielded a significantly higher risk of PTSD among female participants than among male participants (OR = 1.46, 95% CI = 1.11–1.91), and the 9 severity studies showed a significantly greater severity of PTSD among female participants (*d* = 0.30, 95% CI = 0.09–0.51). The 35 pooled studies similarly showed a sex difference (*d* = 0.24, 95% CI = 0.12–0.36). In none of these cases, however, was the effect robust against the file-drawer effect. Table 4 shows that this basic pattern of findings was repeated across most methodological variables.

Summary. Figure 1 shows the aforementioned categorical and continuous data in summary form, using *d* as a common metric of effect size. Dashed lines in the figure denote commonly accepted values for small (*d* = 0.2) and medium effects (*d* = 0.5). Across all studies, when male and female participants experienced the same category of traumatic event, there was a small to moderate effect indicating greater frequency or severity of PTSD among

female participants compared with male participants (*d* = 0.29, 95% CI = 0.23–0.34). Visual inspection of the figure yields several points of note. First, there is substantial uniformity across the different methodological variables, with most effect-size estimates in the small to moderate range. Second, the effect for higher frequency of PTSD in female participants appears strongest (with effects in the moderate to large range) when *DSM-IV* Criteria A1

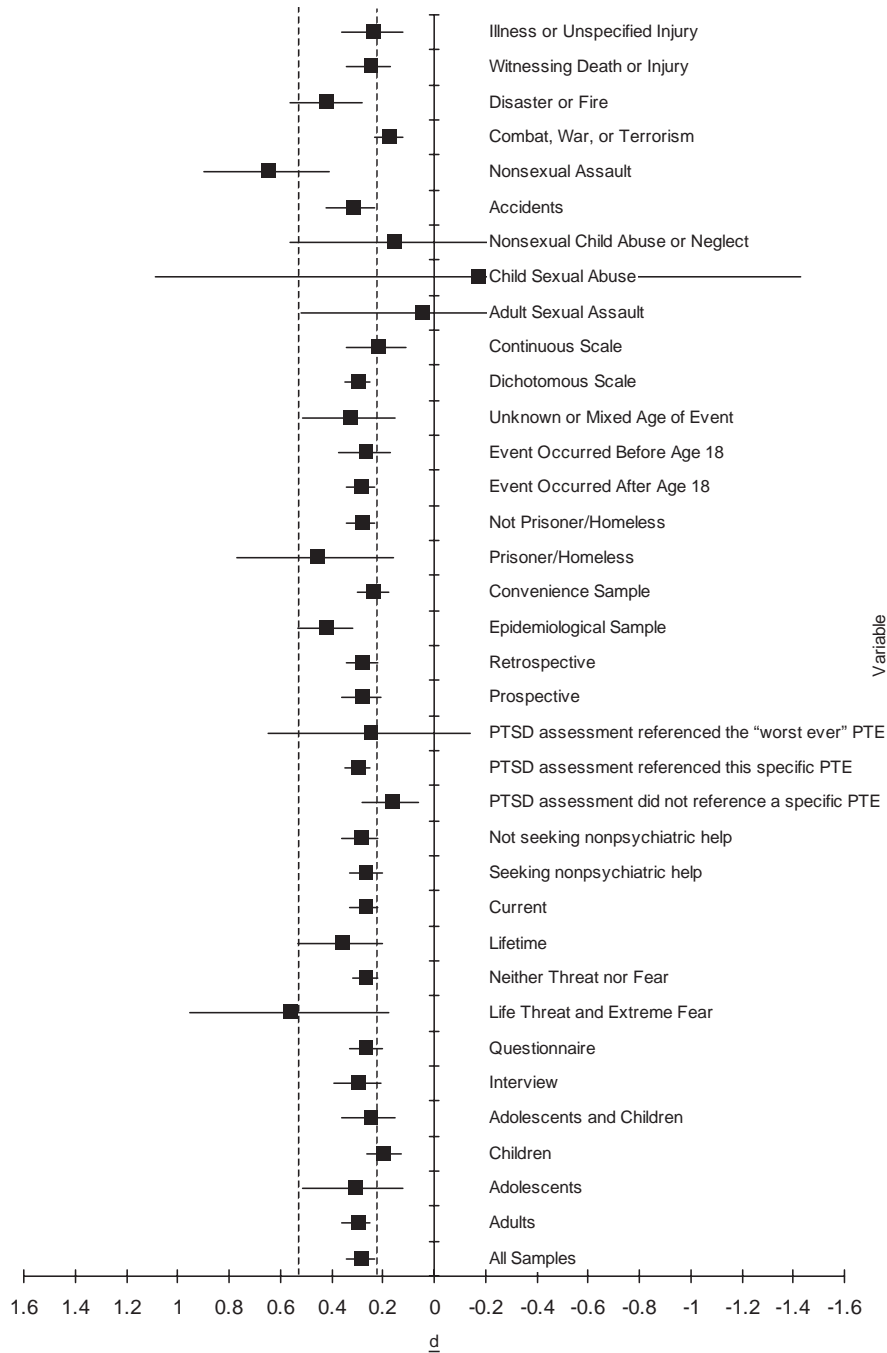


Figure 1. Mean (95% confidence interval) effect size (*d*) of posttraumatic stress disorder (PTSD) frequency and severity among male and female participants reporting the same category of traumatic event. PTE = potentially traumatic event.

and A2 are used and for studies of victims of nonsexual assault. Third, the sex differences are smallest (effect size between -0.19 and 0.19) when the PTSD assessment was not explicitly linked to the index event and for studies of victims of adult sexual assault and child sexual abuse, nonsexual child abuse, and combat, war, or terrorism. Child sexual abuse, in particular, was the only effect size that went in the opposite direction, although this effect was below the criterion for a small effect and was not significant due to a high degree of interstudy variability. Examination of nonoverlapping CIs suggested that epidemiological samples were associated with a significantly stronger sex difference than were convenience samples. Studies of disaster victims yielded a significantly greater effect for sex than did studies of combat, war, or terrorism, and studies of nonsexual assault victims yielded a greater effect for sex than did studies of participants who had witnessed death or injury or who reported illness or unspecified injury.

Discussion

Summary and Conclusions

The obtained results, although not always consistent, provide some preliminary answers to the four questions posed at the beginning of this article. With regard to the question of whether female participants are more likely than male participants to meet diagnostic criteria for PTSD, we found that regardless of the type of study, population, type of assessment, or other methodological variables, women and girls are more likely than men and boys to meet criteria for PTSD. This is consistent with epidemiological research showing a higher prevalence of fear- and anxiety-based disorders in general among female respondents (e.g., Bourdon et al., 1988). In the National Comorbidity Survey (Kessler et al., 1994), the lifetime prevalence of any anxiety disorder (excluding PTSD) among adult men and women was 19% and 30%, respectively, a difference that is roughly comparable to that for PTSD in the same study (Kessler et al., 1995). Similar findings have been reported among children (Anderson, Williams, McGee, & Silva, 1987) and adolescents (McGee et al., 1990), and our finding of a higher risk of PTSD among girls than among boys is consistent with this pattern.

Having found a nearly twofold increase in PTSD frequency among female participants than among male participants, our next question was whether this finding was attributable to a higher risk of traumatic experience among female participants. This does not appear to be the case: On the contrary, across studies, male, rather than female, participants were more likely to report a history of PTE. Thus, the higher prevalence of PTSD in female participants cannot be attributed to their higher risk of experiencing a PTE. Rather, female participants are more likely to meet criteria for PTSD despite a lower overall likelihood of PTE.

Although male participants are more likely to report an overall PTE history than are female participants, we wondered whether female participants were more likely to experience certain kinds of PTEs that might be associated with a greater vulnerability to develop PTSD. Results indicated that male participants are more likely than female participants to report experiencing accidents, nonsexual assault, combat or war, disaster or fire, or serious illness or unspecified injury and witnessing death or injury. Female participants, on the other hand, are more likely than male participants

to report experiencing sexual assault and child sexual abuse, which may be more likely to contribute to the development of PTSD. Thus, one possible interpretation of the higher frequency of PTSD among women and girls is that they are more likely than their male counterparts to experience sexual assault and abuse. Partially consistent with this notion is the finding that sex differences in the prevalence of anxiety disorders diminish (but are not eliminated entirely) when controlling for variance attributable to sexual abuse (Fergusson, Swain-Campbell, & Horwood, 2002).

Unlike the overall finding for PTSD, in which the basic pattern repeated regardless of the methodological variables of the study, the findings of sex differences in PTE frequency depend in part on how the study was conducted. When the incidence of traumatic events was assessed over a discrete time period (e.g., the past year) rather than the person's entire lifetime, sex differences disappeared, likely due to the limited number of traumatic events experienced during that period. Sex differences were less consistently evident across convenience samples (which tended to employ questionnaires) than in epidemiological studies (which tended to use structured interviews). The addition of *DSM-IV* Criteria A1 and A2 did not appear to diminish male participants' reports of trauma. This was somewhat surprising, as one might expect from traditional sex roles that male participants would be reluctant to describe an event as life threatening or eliciting severe fear. Two epidemiological studies (Norris, Foster, & Weissnar, 2002; Perkonig, Kessler, Storz, & Wittchen, 2000) in which the prevalence of trauma with and without Criterion A2 (extreme fear) was examined within the same samples found that the requirement of a reported fear response decreased male participants' reported trauma frequency, thus reducing the obtained sex difference. Thus, the impact of Criteria A1 and A2 on sex-specific reports of trauma remains unclear.

Could the increased risk of PTSD among women and girls be attributed solely to a higher risk of adult sexual assault and child sexual abuse? This interpretation of the findings would be supported if male and female participants did not differ in terms of PTSD when the type of traumatic event was held constant. Thus, we examined both the frequency and the severity of PTSD among male and female participants who reported the same category of PTE. Overall, within the same PTE types, female participants were more likely to meet criteria for PTSD and reported greater severity of PTSD than did male participants. With regard to adult sexual assault (which was more frequently reported by female participants), the few available studies yielded no significant sex differences in PTSD. For child sexual abuse (which was also more frequently reported by female participants), there was no overall sex difference in PTSD, although significant differences did emerge under certain methodological circumstances (e.g., among adults or when structured interviews were used). With regard to the PTEs endorsed more frequently by male participants (accidents, nonsexual assault, combat or war, disaster or fire, witnessing death or injury, and serious illness or unspecified injury), within each of these categories a significant sex difference was found, indicating a higher frequency and severity of PTSD among female participants than among male participants.

These results suggest that the higher prevalence of PTSD among women and girls than among men and boys cannot be attributed solely to a higher risk of adult sexual assault or child sexual abuse. Although adult sexual assault does not appear to be associated with

a differential PTSD response, some evidence suggests a greater vulnerability for child sexual abuse–related PTSD among women and girls than among men and boys. A stronger argument against this hypothesis, however, comes from the fact that, even within the PTE categories more often endorsed by men and boys, women and girls still show an elevated risk of developing PTSD. Thus, the twofold risk for PTSD among female participants overall cannot be attributed solely to a higher frequency of specific, highly pathogenic PTEs such as sexual assault. Rather, the higher risk of PTSD for female participants seems to cut across PTE categories.

Might the obtained sex differences in reported PTE and PTSD symptoms be mere methodological artifacts? We did find that the results differed across subanalyses of potential mediating variables. However, with such a large number of analyses one would expect to find a certain amount of fluctuation; therefore, we analyzed the results of each methodological variable across PTE categories, as shown in Figure 1. Epidemiological studies were associated with a significantly greater sex difference in PTSD than were convenience-sample studies. Perhaps convenience samples introduce sampling error that affects male and female participants differently. For example, the finding that male victims of motor vehicle accidents presenting to the emergency room are more severely injured than are female victims (Ehlers, Mayou, & Bryant, 1998) may suggest that men are less likely to seek medical attention unless the injury is severe. Samples of college students, conversely, may underrepresent victims (who are mostly female) of child sexual abuse, as abuse history is associated with higher school dropout rates (Duncan, 2000).

We obtained the strongest effects (with greater PTSD among female participants) when *DSM-IV* Criteria A1 and A2 were used to define the traumatic event, although the addition of these criteria also led to a high degree of interstudy variability. *DSM-III* and *DSM-III-R* defined an event as traumatic on the basis of features of the event itself. However, the introduction of Criteria A1 and A2 in *DSM-IV* means that an event is defined as traumatic partly on the basis of the individual's cognitive and emotional response during and after the event. Two perspectives on this change can be considered. First, it might be argued that the subjective element reduces the overall number of participants who are identified as having been traumatized but substantially increases the proportion of traumatized participants who go on to develop PTSD, thus leading to the perception that some events are more pathogenic than they actually are. An alternative model for conceptualizing trauma might be to identify events that would be considered traumatic for an average person in similar circumstances. This model, which is similar to that used in *DSM-III*, has been advanced in the general life events literature (e.g., Dohrenwend & Dohrenwend, 1978). The other perspective, argued by contemporary learning theorists (e.g., Clark & Ehlers, 2004; Mineka & Zinbarg, 2006), is that one's peritraumatic cognitive, emotional, and behavioral reactions are a critical determinant of the subsequent development of fearful reactions. The inclusion of the individual's reactions to the PTE helps explain why most individuals who experience such events recover and only a minority go on to develop PTSD.

We also found that sex differences in PTSD are diminished when the PTSD assessment does not explicitly reference a particular index PTE and that there is greater interstudy variability when the PTSD assessment references the person's worst-ever event.

Perhaps the method that does not specify any particular PTE may introduce excessive error variance, as participants may be rating their responses to entirely different events. Thus, for example, even though the study authors classify a group of male and female participants as having experienced a motor vehicle accident, the female participants might well answer some or all of the PTSD questions in reference to an adult sexual assault or childhood sexual abuse instead. The sex difference in PTSD seems most clear when the PTSD assessment is explicitly linked to one specific traumatic event.

Other Variables of Potential Interest

It is possible that the obtained sex differences in PTSD are due to additional factors not captured in most studies. These variables range from external variables such as aspects of the traumatic event, preexisting cognitive and affective reactions to PTE, and a tendency toward different expressions of distress for male versus female participants. These variables are discussed at length by Craske (2003); some of the more pertinent issues are discussed below.

Differences within types of PTE. Even within the broad PTE categories described earlier, male and female participants may differ according to PTE severity. Although male participants' and female participants' experiences may fall into the same gross PTE category, their actual experiences may be quite different. Historically, male combat veterans have had on average more direct combat exposure than their female counterparts. As the role of women in the military expands, more information is becoming available about sex differences in combat-related PTSD. In large samples of Desert Storm veterans, female participants showed greater PTSD than did male veterans (Engel et al., 1993; Wolfe, Erickson, Sharkansky, King, & King, 1999). However, sex differences in PTSD after controlling for combat exposure were not calculated. In a large sample of U.S. military personnel deployed to Somalia, male and female participants presented with approximately equal rates of PTSD (Litz et al., 1997). However, male participants also reported significantly more combat exposure than did female participants. Future studies on combat-related PTSD should examine the interaction between sex and combat exposure in combat-related PTSD. Just as male combat veterans typically experience more severe combat exposure than do their female counterparts, female nonsexual assault victims are more likely than male participants to be assaulted by a family member or intimate partner (Singer, Anglin, Song, & Lunghofer, 1995; Vrana & Lauterbach, 1994) and to sustain more serious injury as a result of such violence (Cantos, Neidig, & O'Leary, 1994; Cascardi, Langhinrichsen, & Vivian, 1992). Among participants reporting child sexual abuse, male participants are more likely than female participants to report the use of physical force or threats during the abuse (Finkelhor, Hotaling, Lewis, & Smith, 1990; Fritz, Stoll, & Wagner, 1981; Risin & Koss, 1987), which may, in turn, lead to a greater risk of psychological disturbance (Roessler & McKenzie, 1994). Female child sexual abuse victims, on the other hand, are more likely to report multiple incidents of abuse and to have been abused by a close family member (Fischer, 1992). In both epidemiological and convenience-sample studies, male victims of adult sexual assault are more likely than their female counterparts to have been assaulted by multiple perpetrators, to have been attacked

multiple times, and to have been physically beaten during the sexual assault (Kaufman, Divasto, Jackson, Voorhees, & Christy, 1980; Pino & Meier, 1999); the relationship between these variables and the subsequent development of PTSD has not been clarified. The greater prevalence of motor vehicle accident-related PTSD among female participants does not appear to be attributable to severity of injury, as male participants reported greater severity of physical injury in a large sample of motor vehicle accident survivors (Ehlers et al., 1998). In a sample of volunteer responders to an airline disaster, male volunteers were more likely than female volunteers to work on recovery of human bodies, whereas female volunteers were more likely to work on supply distribution and meal preparation (Stewart, Mitchell, Wright, & Loba, 2004). Among a sample of brain injury patients, male participants' injuries were more likely to be the result of gunshot wound or motor vehicle accident, whereas female participants' injuries were more likely to be the result of falls or cerebrovascular accident (Ohry, Rattok, & Solomon, 1996). Thus, grouping male and female participants under a single PTE label, such as *accidents*, *combat*, or *rape*, risks obscuring important sex-specific differences in victims' experiences.

A related concern is how researchers and study participants determine that someone has experienced a trauma. A recent example of this problem comes from research investigating the psychological effects of the terrorist attacks of September 11, 2001. It might be argued that being 1, 10, or 1,000 miles away from the World Trade Center or the Pentagon is inherently less traumatic than being at ground zero. Indeed, studies have demonstrated that participants' distance from ground zero is directly related to PTSD symptom severity (Blanchard et al., 2004; Galea, Ahern, et al., 2002). However, participants in either case might be classified as having experienced the terrorist attack. Furthermore, there may well be individual differences in participants' decisions about whether to endorse having experienced the event on a checklist, particularly when the event was far away or there was little or no actual personal loss. One main concern for researchers is that participants might implicitly use the presence of posttraumatic symptoms as a deciding factor in whether to identify themselves as having experienced a traumatic event—for example, two participants who were equidistant from ground zero might differ in their response to a survey question such as "Have you ever experienced a terrorist attack?" and the individual who is still bothered by nightmares and intrusive memories might be more likely to respond affirmatively. We suggest that simple checklists or even cursory interviews may be insufficient for the measurement of the epidemiology of trauma. The need for more precise estimates demands a more thorough assessment that includes all of the relevant variables described earlier.

Differences in symptom patterns other than PTSD. An alternative explanation for the observed sex differences in PTSD is that male participants are more likely than female participants to exhibit posttraumatic symptoms other than PTSD. This hypothesis posits that male participants' posttraumatic reactions are different from, but not necessarily less disturbing than, those of female participants (Gibbs, 1989). In the National Comorbidity Survey Replication (Kessler, Chiu, Demler, & Walters, 2005), latent class analysis was used to identify patterns of psychiatric symptoms. Although this study did not specifically examine posttraumatic responses, the results are potentially relevant. Compared with

female participants, male participants were less likely to report internalizing disorders (e.g., anxiety or depression), by themselves or with comorbid conditions, and were more likely to report externalizing disorders (e.g., conduct disorders or substance use disorders), alone or with comorbid conditions.

Investigations of behavioral sequelae of traumatic events show a similar pattern, although results have been somewhat mixed (Chilcoat & Breslau, 1998; McFall, Mackay, & Donovan, 1992). Among adult disaster survivors, male participants showed increased alcohol consumption, whereas female participants showed increased depression and somatic complaints (Solomon, Smith, Robins, & Fischbach, 1987). Among child sexual abuse survivors, drug use rates were greater for male participants than for female participants, whereas female participants showed a greater prevalence of suicide attempts (Darves-Bornoz, Choquet, Ledoux, Gasquet, & Manfredi, 1998; Silverman, Reinherz, & Giaconia, 1996). One possible contributor to posttraumatic substance abuse among male participants is self-medication, in which alcohol or other substances serve either to reduce tension or to facilitate avoidance (e.g., Wilson, 1988). The anxiety-reducing effect of alcohol may be particularly pronounced in male participants (Abrams & Wilson, 1979; Wilson, Abrams, & Lipscomb, 1980), which may in turn enhance the degree of negative reinforcement for drinking among men.

Male participants may also be more likely to express posttraumatic distress in the form of irritability, anger, or violent behavior. Among children and adolescents measured 2 years following the Buffalo Creek dam collapse of 1972, girls exhibited higher levels of anxiety, depression, and overall symptom severity than did boys, but boys exhibited greater belligerence (e.g., verbal and physical aggression). Similarly, among adults female participants exhibited higher levels of anxiety and depression, whereas male participants showed more belligerence and alcohol abuse (Green et al., 1997). In comparison to physically or sexually abused girls, abused boys were more likely to exhibit aggressive behaviors and violent outbursts (Darves-Bornoz et al., 1998) and to meet diagnostic criteria for conduct disorder (Livingston, Lawson, & Jones, 1993). Findings such as these, however, are potentially confounded by differences in base rates of psychopathology, as discussed below.

If sex differences in symptom patterns do exist, one possible explanation is that gender role expectations may be more supportive or tolerant of certain symptoms in female participants and of other symptoms in male participants. Social expectations about gender appear to be fairly consistent over time and across cultures, suggesting that men and boys are viewed as active and aggressive, whereas women and girls are viewed as passive and emotional (Eagly, 1987). Belligerent or aggressive behavior might be considered more acceptable responses to trauma for men and boys, whereas anxious or depressed behavior might be considered more acceptable for women and girls. Thus, the experience of a PTE may exacerbate preexisting socially influenced gender differences in response to distress, resulting in different posttraumatic symptom patterns. However, this explanation is speculative and awaits empirical test. Specifically, it remains to be seen whether the preexisting gap in these symptoms widens after a traumatic event.

Differences in cognitive and behavioral response to a PTE. An emerging body of research suggests that peritraumatic and posttraumatic cognitive responses predict the development of

PTSD; male and female participants may differ in terms of these responses. In surveys of PTE survivors, male participants rated motor vehicle accidents as less frightening than did female participants (Ehlers et al., 1998); however, partial correlations of sex with PTSD symptom severity remained significant even after controlling for degree of perceived threat. Male participants also described child sexual abuse as more neutral or positive and less negative than did female participants (Fritz et al., 1981; Nash & West, 1985; Schultz & Jones, 1983). Among victims of sexual assault, 53% of women, and only 11% of men, described the assault as their worst-ever experience (Vrana & Lauterbach, 1994).

We (Tolin & Foa, 2002) examined sex differences on the Posttraumatic Cognitions Inventory (Foa, Ehlers, Clark, Tolin, & Orsillo, 1999), a measure of trauma-related thoughts and beliefs. Compared with male PTE survivors, female PTE survivors endorsed more self-blame for the event, greater belief that they were incompetent or damaged, and greater belief that the world is dangerous. However, owing to sample size limitations, we were unable to separate sex differences from differences in type of PTE. Furthermore, the presence of sex differences in beliefs among PTE survivors does not provide evidence of causality; it is possible that the obtained cognitive differences were due to differences in PTSD symptom severity.

Immediate posttrauma coping strategies have been found to predict the subsequent onset of PTSD (Clohessy & Ehlers, 1999; Valentiner, Foa, Riggs, & Gershuny, 1996); male and female participants might differ in this respect (see Vingerhoets & Van Heck, 1990). For example, female paramedics were more likely than their male counterparts to report using the coping strategies of wishful thinking, mental disengagement, and suppression of trauma memories. Regardless of sex, these strategies correlated positively with severity of PTSD symptoms (Clohessy & Ehlers, 1999).

Methodological Limitations in the Assessment of Sex Differences in PTEs and PTSD

As many authors (e.g., Wilson & Rachman, 1983) have noted, a meta-analysis is only as reliable as the studies it contains. Although we view meta-analysis as a broad brush with which to depict the current status of the literature and hence have opted for inclusion rather than exclusion of studies, several threats to the reliability and validity of the studies we reviewed are noted in detail below. These include unreliability of self-reports of PTE, potential self-reporting bias of PTSD symptoms, and failure to account for differences in base rates of psychopathology.

Reliability and validity of self-reports of PTEs. As discussed earlier, self-report of traumatic experience is inherently limited by the precision of the definition of trauma. Individual differences in reporting style may also confound results, particularly among individuals with PTSD. In a study of Desert Storm veterans assessed 1 month and again 2 years after their return from the Gulf War, discrepancies in trauma reports between the two time points were noted in 88% of participants (Southwick, Morgan, Nicolaou, & Charney, 1997). Amplified retrospective reports of combat trauma have been associated with greater severity of PTSD (Romer et al., 1998; Southwick et al., 1997) and poorer perceived health status (Wessely et al., 2003). In a study of participants reporting sexual assault, when assessed at two time points 1 year

apart male participants were more likely than female participants to retract reports of abuse (Scott & Aneshensel, 1997). Investigations of child sexual abuse that occurred years or decades ago may suffer from similar limitations. Researchers have remarked that the use of retrospective studies constitutes a weakness of the field of child sexual abuse research in general (Ornstein, Ceci, & Loftus, 1998), although longitudinal study of this issue is pragmatically quite difficult. We noted a large variability of child sexual abuse prevalence estimates across studies. Although epidemiological research has indicated that 3% of male participants and 12% of female participants experience child sexual abuse (Kessler et al., 1995), some studies using convenience samples indicate higher rates, with estimates appearing to vary depending in part on the definitions of abuse. For example, when child sexual abuse is defined as any sexual experience occurring before age 18, 22% and 50% of male and female participants, respectively, identify themselves as having experienced child sexual abuse (Rew, Esparza, & Sands, 1991). In a similar sample, when child sexual abuse was defined more conservatively as prepubescent sexual contact with an adult, the rates were 5% and 8% for male and female participants, respectively (Fritz et al., 1981). Thus, accurate estimates of the prevalence of child sexual abuse await a consensus in the field as to what should be considered child sexual abuse and what should not.

It might be argued further that the presence of PTSD symptoms renders an individual more likely to report that a traumatic event occurred or to describe the event as dangerous and frightening (*DSM-IV* Criteria A1 and A2). Research using paradigms from cognitive psychology has suggested that individuals are more likely to recall events that are consistent with current mood (e.g., Gilligan & Bower, 1984), although this finding is less robust for childhood memories (e.g., Gerlsma, Kramer, Scholing, & Emmelkamp, 1994). Current mood, anxiety, or both also appear to influence subjective evaluations of risk: Anxious, depressed, and agoraphobic patients all tend to rate a range of events as more dangerous than do nonclinical control participants (Butler & Mathews, 1983; McNally & Foa, 1987). Furthermore, this bias disappears following successful treatment (McNally & Foa, 1987), suggesting that the interpretation of events as risky can be a direct result of current emotional distress. Future studies of subjective appraisals of traumatic events before and after treatment of PTSD may help to clarify this issue.

Reliability and validity of self-reports of symptoms. Another potential threat to the reliability of self-report is that male participants may tend to underreport psychiatric symptoms as compared with female participants, perhaps because open expression of fear is discouraged by the traditional masculine gender role. Indeed, studies of nonpatients indicate that female participants report more severe fears and phobias than do male participants on measures of self-reported fear (Agras, Sylvester, & Oliveau, 1969; Brown & Crawford, 1988; Cornelius & Averill, 1983; Farley, Sewell, & Mealiea, 1982; Geer, 1965; Kleinknecht & Lenz, 1989; Klorman, Weerts, Hastings, Melamed, & Lang, 1974) and are twice as likely as male participants to meet criteria for specific phobia (Fredrikson, Annas, Fischer, & Wik, 1996). Surveys such as these, however, cannot determine whether the obtained sex differences are due to reporting bias or whether they reflect actual differences in experienced fear. Studies that attend to this distinction are limited, and results have been mixed. Consistent with the reporting-bias

hypothesis are data from Pierce and Kirkpatrick (1992), who measured self-reported fear of male and female college students at two occasions 1 month apart. During the first session, participants completed a self-report fear survey. Before the second assessment, in which participants completed the survey while viewing fear-inducing pictures, participants were told to be as accurate as possible, because their fear would be objectively measured using a heart rate plethysmograph. Male participants', but not female participants', self-reported fear increased following these instructions, resulting in comparable reports of fear across sex. Pierce and Kirkpatrick interpreted the results to indicate that the male participants' initial self-reported fear had been spuriously low, whereas female participants' reports had been accurate. An alternative explanation is that the instructions elicited disproportionate expectancy or response biases among male participants, thus leading them to overreport during the second assessment.

Other studies support the alternative hypothesis that male participants actually experience less fear of certain stimuli than do female participants. In two studies, male participants' lower self-reports of fear were corroborated by lower psychophysiological indices of fear (skin conductance and heart rate increases; Cornelius & Averill, 1983; Katkin & Hoffman, 1976); we note as well that a high level of immediate posttraumatic physiological arousal predicts later development of PTSD (Blanchard, Hickling, Buckley, et al., 1996; Shalev, Sahar, et al., 1998). Among male and female participants reporting high fear of snakes, male participants showed less avoidance of snakes than did female participants on a behavioral avoidance test (Speltz & Bernstein, 1976). Also contrary to a reporting-bias hypothesis is the finding that sex predicted fear ratings for animal and situational phobias, even after controlling for masculine and feminine gender role identity (Arrindell, Kolk, Pickersgill, & Hageman, 1993).

One way to address the issue of reporting bias versus actual sex differences in PTSD might be to use multimodal assessment. Psychophysiological assessment, for example, demonstrates that male veterans (Malloy, Fairbank, & Keane, 1983), female rape survivors (Kilpatrick, Best, Amick, & Veronen, 1984), and motor vehicle accident survivors of both sexes (Blanchard, Hickling, Taylor, Loos, & Gerardi, 1994) exhibit autonomic characteristics of fear (e.g., heart rate increase) when presented with trauma-related stimuli. Moreover, several studies have indicated that individuals with PTSD show greater physiological arousal on exposure to trauma reminders than do traumatized individuals without PTSD (Orr et al., 1998). Several authors (Malloy et al., 1983; Newman, Kaloupek, & Keane, 1996; Pitman & Orr, 1993; Resnick, Kilpatrick, & Lipovsky, 1991) have recommended incorporating psychophysiological and behavioral forms of assessment into the evaluation of PTSD. Future investigations of sex differences along these response channels may help clarify whether the relatively low rates of self-reported fear in traumatized male participants accurately reflect differences in experienced fear.

Differences in cumulative PTE history. It might be argued that female participants are more likely than male participants to experience multiple PTEs across the life span, which may increase their risk of developing PTSD (Follette, Polusny, Bechtle, & Naugle, 1996). For example, in a study of patients admitted to an emergency room following motor vehicle accidents, results from this meta-analysis suggest that the female patients would be more

likely to have a prior history of sexual assault or abuse (which may or may not be disclosed or even queried). The cumulative effect of multiple events might therefore increase the risk of developing PTSD following the motor vehicle accident. Several studies have suggested that the risk of PTSD following an index event is significantly predicted by both distal and proximal traumatic experiences that occurred before the index event (Lloyd & Turner, 2003; McFarlane, 1988). Furthermore, stressful or uncontrollable life events subsequent to the index event also appear to increase the risk of chronic PTSD (Brewin, Andrews, & Valentine, 2000).

Few studies have examined the number and breadth of traumatic experiences. In a large-scale epidemiological study, male and female participants did not differ significantly in terms of the number of events reported. Women were more likely than men to meet criteria for PTSD, and this did not change when controlling for the number of traumatic events (Breslau, Davis, Andreski, Peterson, & Schultz, 1997). In samples of college students, men reported experiencing a greater number of traumatic events than did women, although women remained at higher risk for PTSD and PTSD symptoms (Amir & Sol, 1999; Vrana & Lauterbach, 1994). In the latter study, the number of lifetime traumatic events predicted PTSD symptoms more strongly for women than for men (Vrana & Lauterbach, 1994).

Differences in base rates of psychopathology. Another methodological limitation of most studies of sex differences in PTSD is that they do not take into account differences in base rates of psychological distress that are independent of PTE. In most PTSD studies, participants are assessed only after the PTE has occurred. The diagnostic criteria for PTSD (American Psychiatric Association, 1994) specify the requirement that a traumatic event has occurred; however, many PTSD symptoms (e.g., irritability, reduced interest in activities, sleep disturbance) are included in other diagnostic categories and thus may exist in the absence of PTE as well. Without a measure of pre-post PTE change in symptoms, it is impossible to determine whether the reported symptoms were actually the result of the PTE. It has been fairly well established that even at a young age, girls display greater levels of negative affectivity than do boys (McCrae et al., 2002). In adolescence and adulthood, anxiety and depression are more prevalent among female participants, whereas aggressive behavior, substance abuse, and conduct problems are more frequent among male participants (Kessler et al., 2005, 1994; Kilpatrick et al., 2000). Thus, one might argue that had they not been traumatized, the participants would still have exhibited sex differences in psychiatric symptoms. The use of nontraumatized samples would help address this issue. An example of this design comes from Boney-McCoy and Finkelhor (1996), who assessed PTSD symptoms among male and female assault survivors, as well as among nonassaulted male and female participants. The severity of PTSD symptoms among sexually assaulted male and female participants was roughly equal; however, when compared with nonassaulted samples, the effect size was somewhat larger for male participants than for female participants. Conversely, when male and female victims of nonsexual assault were compared with nonassaulted samples, the effect was much greater for female participants than for male participants. Thus, comparing the prevalence of PTSD only among PTE survivors, without regard for base rates of psychiatric symptoms, may lead to misleading conclusions. In both convenience-sample (Fauerbach et al., 1997) and epidemiological (Breslau et

al., 1997) research, reported pretrauma history of anxiety and depressive disorders was associated with an increased likelihood of PTSD following an index event, although in the latter study sex differences in PTSD remained even after controlling for pretrauma psychiatric status.

A further complication is that individuals with psychiatric, behavioral, or substance problems may be at increased risk of experiencing a traumatic event, in which case the causal relationship becomes even more complicated (Breslau, Davis, Andreski, & Peterson, 1991; Cottler, Compton, Mager, Spitznagel, & Janca, 1992; Deykin & Buka, 1997). This dilemma might be addressed most effectively using longitudinal research in which participants are assessed both before and after experiencing a traumatic event.

The issue of sex differences in trauma and PTSD is both complex and sensitive. As shown in this quantitative review, male and female participants tend to experience different forms of PTEs. However, even when controlling for type of PTE, measurable sex differences in PTSD prevalence and severity remain. The field of PTSD is still relatively new compared with many other disorders, and much more research is needed before strong conclusions can be reached regarding how sex acts as a vulnerability or resilience factor.

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