Stress and Vulnerability to Posttraumatic Stress Disorder in Children and Adolescents

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Objective: This study examined the experiential factors and interacting vulnerabilities that contribute to the development of posttraumatic stress disorder (PTSD) in children and adolescents.

Method: Of 100 consecutive referrals to an inner-city child and adolescent psychiatry clinic, 59 had experienced a trauma that qualified as a precipitant of PTSD. For those with trauma, ages ranged from 3 to 18 years (mean=9.9, SD=4.10); 39 (66%) were males. The authors used a series of multiple regression analyses to examine the contribution of demographic characteristics, the nature of the stressor(s), and the role of preexisting clinical signs in the development of PTSD.

Results: Twenty-two percent of the 59 children who had been traumatized met full criteria for PTSD, 32% had some symptoms of PTSD but did not meet full criteria, and 46% had no symptoms of PTSD. Witnessing domestic violence or being physically abused predicted severity of PTSD. Children with preexisting aggressive behavior were more likely to be victims of physical abuse.

Conclusions: Traumatic experience interacts with factors in the child and family to contribute to the development of PTSD. Trauma that threatens family integrity appears to make a strong contribution to the development of PTSD. Increased understanding of the factors contributing to PTSD may provide additional opportunities for developing effective interventions.

Posttraumatic stress disorder (PTSD) has been identified as a consequence of military exposure to severe and prolonged stress (1, 2) and was introduced into the psychiatric nomenclature of DSM-III as an anxiety disorder. Although DSM recognizes the unique quality of combat stress, a number of authors have noted that inner-city life also may be characterized by pervasive and dramatic trauma (3–5). However, neither in the military nor in the inner city does exposure to trauma bear an obligatory relation with development of the full PTSD syndrome, and individual vulnerabilities appear to contribute important risk factors.

Evidence that personality contributes to the development of PTSD was reported by Schnurr et al. (6), who capitalized on data that were routinely collected before their subjects entered military service. Their study group, which was all male and virtually all Caucasian, had taken the MMPI as college freshmen some years before their military service. Some MMPI scales were found to predict the development of PTSD symptoms after exposure to combat stress. This unplanned study provided support for the hypothesis that personality factors can contribute to the stress-diathesis model of PTSD.

The mechanisms that transform a stressful experience into a maladaptive anxiety disorder are not fully understood. It seems likely that the trauma must produce significant arousal and, more speculatively, it appears that in many cases the trauma occurs in a situation where the individual is deprived of an instrumental response that is reactive to the trauma. A number of investigators have used opportunities presented by natural or social disasters to investigate the reactions of children and their families and the development of posttraumatic responses. Tiet et al. (7) used epidemiological household probability samples to identify 1,285 youths between 9 and 17 years and their caretakers. The youths were interviewed to determine whether they had experienced any of 25 specific adverse life events; the number of these events constituted the independent measure. The impact of these experiences on the quality of the youths' clinical and social adjustment was examined. Better family functioning and higher IQ were found to help the child's adjustment, and maternal psychopathology was found to interact with adverse experiences to compromise the child's adjustment. Similar findings were noted by Laor et al. (8), who examined Israeli preschoolers. Younger children whose homes had been damaged by Scud missiles during the Persian Gulf War were at greater risk of developing stress symptoms if their mothers were also symptomatic.

Yehuda and her group (9, 10) examined Holocaust survivors and their offspring. The offspring, who had not themselves been exposed to the Holocaust trauma, were found more likely to show intrusive but not avoidant behaviors and more likely to respond to trauma with PTSD if their

parents had PTSD. In a series of important studies, Pynoos and his collaborators examined the various reactions of children and adolescents who were exposed to the same disaster. In one of their studies, children's reactions to an earthquake were examined (11). Another study examined the reactions of elementary school children to an incident in which a sniper fired repeated rounds of high-powered ammunition at students in a playground (12). One child and a passerby were killed, and 13 children were injured. The study, which began a month after the incident, located study subjects through a sample of the children in the school. Reports of symptoms were obtained by using a child version of the PTSD Reaction Index, an instrument developed by Frederick (13). Because all of the children had been exposed to the same trauma, the authors developed two metrics of the severity of PTSD symptoms on the basis of the distance the child had been from the playground at the time of the incident and how well the child knew the victims. By using these metrics, the researchers were able to establish the psychometric characteristics of the PTSD Reaction Index, analyze the coherence of items in the instrument, and perform a factor analysis. Three factors emerged; two were similar to the criteria of intrusive thoughts and arousal for the DSM-IV diagnosis of PTSD. The criterion of avoidant behaviors for the DSM-IV diagnosis of PTSD was replaced by an anxious/agitated factor in the PTSD Reaction Index. Although intense stimuli seem more likely to produce both the symptom of increased arousal required for a DSM-IV diagnosis of PTSD and the symptom of response paralysis, some environmental objects seem more powerful than others as a source of fear.

Seligman (14) suggested that evolution has prepared the nervous system to recognize specific objects, such as spiders and snakes, as portending threat. Such objects often serve as the focus of phobic reactions. LeDoux (15) has argued that amygdala neural circuits underlie fear reactions and that cortical circuits are involved only indirectly. Thus the immediate response to severe threat does not appear to be a conscious process. Some combination of these factors may make fear learning intractable. For example, lack of cortical involvement may contribute to the resistance of anxiety disorders to resolution by traditional verbal therapies.

Ohman (16) extended Seligman's preparedness theory in a series of experimental studies, showing that subjects more readily develop conditioned fears to phobic-like stimuli. In addition, the reactions to prepared stimuli were more resistant to extinction than were reactions to more evolutionarily recent stimuli (e.g., a spider compared to a pistol). As the report of Schnurr et al. (6) suggests, individuals differ in vulnerability to the development of anxiety disorders. Seligman's theory (14) permits empirical approaches to examining the contribution of situational and constitutional factors to the likelihood that an anxiety disorder will develop from a stressful situation. Further, the

theory permits empirical approaches to the examination of behavioral and even pharmacological therapies for anxiety disorders.

DSM-IV identifies the experience of an extreme trauma as the first criterion (A1) for the diagnosis of PTSD. In a study of a cohort of 221 African American subjects (age range=7 to 18 years), Fitzpatrick and Boldizar (3) reported that 70% of the group had experienced at least one event that qualified as an extreme trauma; of these subjects, 27% went on to develop the intrusive thoughts, the avoidant behaviors, and the psychophysiological arousal that are required for a DSM-III diagnosis of PTSD. The identification of factors that predispose to PTSD could represent an important opportunity for preventive intervention for this condition.

The study reported here examined the experiential factors and the interacting vulnerabilities that contribute to the production of a full clinical PTSD syndrome after exposure to a source of stress. We pursued the following specific questions within the stress-diathesis model: 1) Do different types of trauma vary in their potential for producing PTSD symptoms? 2) Are different symptoms of PTSD equally likely to develop? 3) Do preexisting clinical conditions moderate the severity of the diathesis? and 4) Do constitutional factors such as age, gender, or IQ modify the development of pathology?

Method

Subjects

One hundred consecutive referrals to an inner-city outpatient child and adolescent psychiatry clinic were screened by using the Children's Structured Clinical Interview for DSM-IV (KID-SCID) (17, 18) to identify subjects who had experienced a traumatic event that was deemed by both the intake clinician and the director of the clinic's evaluation service to meet the A1 criterion for PTSD in DSM-IV. Of the 100 referrals, 59 children and their parents or guardians reported at least one qualifying trauma. The traumas included physical abuse by a parental adult (N=14, 24%), sexual abuse by an adult (N=13, 22%), witnessing serious domestic violence (N=23, 39%), and other traumas (N=32, 54%). Some children experienced multiple types of trauma, yielding a total of more than 100%. Other traumas reported by subjects included being present when the family home was broken into, being robbed or mugged, witnessing acts of violence to others, being seriously wounded, being in a fire, and witnessing a serious accident or the death of a parent or sibling.

The 59 patients constituted our study group. Their ages ranged from 3 to 18 years (mean=9.95 years, SD=4.10); 39 (66%) were male and 20 (34%) were female. Twenty-eight (47%) were Hispanic, 27 (46%) were African American, three (5%) were Caucasian, and one (2%) was Asian American. The demographic characteristics of this group did not differ substantially from those of the overall clinic population, in which the mean age was 10.63 years (SD=6.24), 66% of the patients were male, 54% were Hispanic, 43% were African American, and 3% were Caucasian.

Procedures

The diagnostic information for this report was collected during a systematic structured intake. The evaluation was based on approximately 6 hours of interviews, during six sessions, with each

of the children and their parents or guardians. The examination was based on a semistructured comprehensive interview schedule, the KID-SCID. Psychometric properties for the KID-SCID have been reported (17, 18), and the instrument has demonstrated acceptable reliability. The KID-SCID integrates information provided by parents/guardians and children in making a diagnostic decision. All children referred to the clinic receive this standardized evaluation. The PTSD module of the KID-SCID specifically asks both the patient and the parent/guardian about 12 different traumatic experiences. Responses to these probes are followed-up, where appropriate, in separate interviews, with the patient and guardians. Similarly, diagnostic features in the sections on intrusive thoughts, avoidant behaviors, and psychophysiological activation are explored. With these data, current and lifetime diagnoses of PTSD can be established. Some of the children who participated in the study had experienced multiple repetitions of a trauma, but the frequency of trauma (compared with the type of trauma) could not be reliably ascertained. Therefore, this study report does not discuss the frequency or severity of specific events. Results from the evaluation were entered into database files from which the information that forms the basis of this report was retrieved. At the time of evaluation, each patient and each parent were informed that the results would be used for professional reports if they so consented. All parents provided written informed consent.

To evaluate the relative contribution of the various background and clinical factors, a dependent measure based on the number of current signs and symptoms of PTSD from the KID-SCID was created. (The number was based on a possible total of 17 diagnostic features from DSM-IV PTSD criteria sets B, C, and D. Criteria set B includes reexperiencing symptoms, criteria set C includes symptoms of persistent avoidance, and criteria set D includes symptoms of increased arousal.) This approach treated the individual's response to a stressor on a continuum of severity rather than as the categorical presence or absence of PTSD. The average number of current signs and symptoms of PTSD per child was 5.4 (SD=3.26).

We examined cognitive measures, including IQ, by using subtests from the age-appropriate Wechsler Intelligence Scale for Children (19) administered by a clinical psychologist on a separate visit; academic delays; and diagnosed learning disabilities determined by screening assessments performed by learning specialists. Demographic and clinical variables included age, gender, ethnicity, pre- and perinatal factors such as prematurity or birth trauma, and factors that predated the trauma, such as clinically significant anxiety, depression, aggression, and sleep disorders in the child. Data on clinical variables were based on responses to questions about lifetime disorders in the KID-SCID.

Data Analysis

Children who experienced traumatic events were assigned to one of three outcome groups: 1) those without any symptoms of PTSD; 2) those with subthreshold PTSD, who had symptoms of PTSD but did not show evidence of the required number of diagnostic features from criteria sets B, C, and D for a DSM-IV diagnosis of PTSD (the children in this study showed from one to five features); and 3) those who met the full criteria for PTSD. Differences among groups were examined in relation to the prediction measures. Because several children had experienced multiple types of trauma, these relationships were examined in a hierarchical multiple regression analysis where all predictors were entered in a block. We derived multiple R as a measure of variance accounted for by the model. Although DSM-IV makes a dichotomous division between cases that do or do not qualify for a diagnosis, we created a continuous severity variable by counting the number of PTSD diagnostic features from the three criteria sets (B, C, D).

TABLE 1. Characteristics of Patients Referred to an Inner-City Child and Adolescent Psychiatry Clinic Who Were Exposed to a Traumatic Event, by Posttraumatic Stress Disorder (PTSD) Outcome[a]

Characteristic	Subjects With No Symptoms of PTSD (N=27)		Subjects With Subthreshold PTSD (N=19)[b]		Subjects Meeting Full Criteria for PTSD (N=13)	
	Mean	SD	Mean	SD	Mean	SD
Age (years)[c]	10.2	4.64	9.8	3.22	9.6	4.11
	N	%	N	%	N	%
Gender						
Male	17	63	13	68	9	69
Female	10	37	6	32	4	31
Ethnicity						
Hispanic	15	56	7	37	7	54
African American	10	37	12	63	5	38
Caucasian	1	4	0	0	1	8
Asian	1	4	0	0	0	0
IQ (N=47)[d]						
Above average[e]	10	53	4	24	1	9
Average	6	32	6	35	5	45
Below average	3	16	7	41	5	45

[a] Traumatic events, as defined by DSM-IV criteria for PTSD, involved actual or threatened death or serious injury or a threat to the physical integrity of self or others.
[b] Subjects who had symptoms of PTSD but did not meet full DSM-IV criteria for PTSD.
[c] Age range was 3–18 years for subjects with no PTSD symptoms, 6–16 for subjects with subthreshold PTSD, and 4–16 for subjects meeting full PTSD criteria.
[d] Eight children with no PTSD symptoms, two with subthreshold PTSD, and two meeting full criteria for PTSD were not assessed; they did not differ in demographic characteristics from the rest of the study group.
[e] Significant difference between groups (χ^2=6.26, df=4, p<0.04).

Then the three outcome groups were examined in relation to clinical antecedents identified by using other KID-SCID modules. Finally, we examined the properties of the diagnostic features that contributed to PTSD in the group who met the full criteria for PTSD. It appears that some items are easily expressed and that other items occur only in children who go on to the full expression of this disorder.

The statistical analysis proceeded from descriptive statistics to a series of univariate analyses to an examination of the relationships among multiple traumas or antecedent clinical features predating the trauma. These clinical features often occurred in clusters, and exploratory hierarchical multiple regression analyses were done to isolate the contribution of individual factors.

Results

The 59 subjects exposed to a trauma that qualified as a precipitant of DSM-IV PTSD were divided into three outcome groups: patients with no PTSD symptoms (N=27, 45.8%), patients with a partial or subthreshold syndrome (N=19, 32.2%), and patients who fully qualified for a diagnosis of PTSD (N=13, 22.0%) (Table 1). There were no differences in subjects' age, gender, and ethnicity that were associated with the severity of the reaction to the traumatic event. However, higher IQ appeared to protect subjects from developing PTSD (χ^2=6.26, df=4, p<0.04).

TABLE 2. Traumatic Events Experienced by Patients Referred to an Inner-City Child and Adolescent Psychiatry Clinic, by Posttraumatic Stress Disorder (PTSD) Outcome, and Number of Diagnostic Features Among Subjects With PTSD Symptoms

Traumatic Event	Subjects With No Symptoms of PTSD (N=27)		Subjects With Subthreshold PTSD (N=19)[a]			Subjects Meeting Full Criteria for PTSD (N=13)		
	N	%	N	%	Mean Number of Diagnostic Features[b]	N	%	Mean Number of Diagnostic Features[b]
Physical abuse	4	15	7	37	1.9	3	23	9
Sexual abuse	7	26	4	21	1.5	2	15	8.5
Witnessing domestic violence	11	41	8	42	1.6	4	31	9.8
Other[c]	16	59	9	47	2.1	7	54	8.7

[a] Subjects who had symptoms of PTSD but did not meet full DSM-IV criteria for PTSD.
[b] Diagnostic features constituting criteria sets B (reexperienced traumatic event), C (avoidant behavior), and D (increased arousal) for DSM-IV PTSD.
[c] Includes being present when the family home was broken into, being robbed or mugged, witnessing acts of violence to others, being seriously wounded, being in a fire, and witnessing a serious accident or the death of a parent or sibling.

The principal traumas experienced by subjects are listed in Table 2, according to outcome. More than 25% of the 59 children were exposed to more than one type of stressor.

The traumatic experiences did not differ in their association with the development of PTSD; 21% of those who were physically abused, 15% of those who reported being sexually abused, and 17% of those who witnessed domestic violence developed PTSD. Because several children experienced multiple types of trauma, a multiple regression analysis was done to estimate the unique contribution of each of the three primary stressors to the severity of the disorder (number of PTSD diagnostic features). The three principal types of trauma were equivalent in producing PTSD, but when the association between trauma and PTSD was viewed as a continuous diathesis, both witnessing serious domestic violence (beta=0.41, df=2, 56, p<0.001) and being physically abused (beta=0.27, df=2, 56, p=0.02) predicted severity, whereas sexual abuse (beta=0.20, df=2, 56, p=0.08) demonstrated only a trend.

With the exception of antecedent anxiety, which correlated with meeting full PTSD diagnostic criteria (r=0.51, df=4, 55, p=0.004), other antecedent clinical signs did not distinguish the outcome groups. We also examined the relationship between clinical antecedents and type of trauma and found some systematic associations. Physical abuse was associated with preexisting aggression (r=0.50, F=12, df=2, 53, p<0.001). Sexual abuse was associated with preexisting anxiety and contributed to more elaborated PTSD symptoms (r=0.70, F=34, df=3, 54, p<0.001). Thus antecedent anxiety did not appear to change the threshold for PTSD, but it did amplify the expression of PTSD symptoms. Witnessing domestic violence interacted with preexisting anxiety (r=0.71, F=30, df=3, 54, p<0.001) to positively predict more fully developed cases of PTSD.

With respect to the interaction of stressors and gender, female subjects were more likely to be physically abused than male subjects, although the difference was not significant (35% versus 18%) (χ^2=2.12, df=1, n.s.). The rates of witnessing domestic violence (female subjects=45%, male subjects=36%) and being sexually abused (female subjects= 25%, male subjects=23%) were comparable in both genders. The mean number of symptoms of PTSD (from criteria sets B, C, and D) did not differ significantly by gender (female subjects=3.5 [SD=3.65]; male subjects=3.0 [SD=3.03]).

Comorbidity was similar for the three outcome groups, with the exception of the classes of outwardly directed, disruptive behaviors. Oppositional defiant disorder and conduct disorder were seen in two of the 13 patients with PTSD (15.4%), compared with 11 of the 27 patients without PTSD symptoms (40.7%) and 11 of the 19 patients in the subthreshold group (57.9%) (χ^2=8.4, df=2, p<0.004).

Table 3 presents the profile of signs seen in the subthreshold group and the group who met full criteria for PTSD. For criteria set B, which includes symptoms of reexperiencing intrusive thoughts and images, the subthreshold group showed approximately half the number of signs, compared to the group who met full criteria for PTSD; 16 of the 19 children in the subthreshold group met criteria set B. Thus, criteria set B did not strongly discriminate between children who developed full PTSD and those who showed a subthreshold condition. However, children in the subthreshold group showed only one-eighth of the avoidant behaviors included in criteria set C, compared to the group who met full criteria for PTSD, and none of the children in the subthreshold group qualified for a diagnosis of PTSD according to criteria set C. Similarly, for the increased arousal symptoms included in criteria set D, children in the subthreshold group showed a mean of only one-twelfth of the behaviors compared to the group who met the full criteria, and none of the children in the subthreshold group met criteria set D. The intrusive memories of criteria set B seemed "easier" to generate than the other categories of symptoms and may be less useful for establishing a threshold for diagnosis, while avoidant behaviors and disturbed psychophysiologic arousal were more pathognomonic for the disorder.

Discussion

This inner-city population experienced a distressingly high rate of trauma (59%). Even this rate is less than the 70% reported by Fitzpatrick and Boldizar (3). However, less than a quarter of subjects who had experienced trauma, despite exposure to a serious stressor, met full criteria for

TABLE 3. Number of DSM-IV Diagnostic Features of PTSD in Patients Referred to an Inner-City Child and Adolescent Psychiatry Clinic Who Were Exposed to Trauma and Developed PTSD Symptoms

DSM-IV Criteria Set and Number of Diagnostic Features	Subjects With Subthreshold PTSD (N=19)[a]			Subjects Meeting Full Criteria for PTSD (N=13)			Ratio[b]
	N	%	Mean Number of Diagnostic Features	N	%	Mean Number of Diagnostic Features	
B. Reexperienced event (at least one diagnostic feature needed for PTSD diagnosis)			1.2			2.5	2
None	3	16		0	0		
One	13	68		3	23		
Two	0	0		0	0		
Three	3	16		10	77		
C. Avoidant behavior (at least three diagnostic features needed for PTSD diagnosis)			0.4			3.3	8
None	11	58		0	0		
One	8	42		0	0		
Two	0	0		0	0		
Three	0	0		10	77		
Four	0	0		2	15		
Five	0	0		1	8		
D. Increased arousal (at least two diagnostic features needed for PTSD diagnosis)			0.3			3.6	12
None	14	74		0	0		
One	5	26		0	0		
Two	0	0		5	38		
Three	0	0		8	62		

[a] Subjects who had symptoms of PTSD but did not meet full DSM-IV criteria for PTSD.
[b] Ratio of mean number of diagnostic features in subjects meeting full PTSD criteria to mean number of diagnostic features in subjects with subthreshold PTSD.

PTSD. This rate is comparable to the rate of 27% reported by Fitzpatrick and Boldizar (3) and to the rate of 19% reported in 297 chemically dependent adolescents by Deykin and Buka (20). Also, Giaconia et al. (21) reported a rate of 15% among 18-year-olds from a predominantly working class community. The rate of conversion to full PTSD is fairly constant despite heterogeneity of demographic characteristics, and we concur with the conclusion of Fitzpatrick and Boldizar (3) that there is a reassuring resiliency in children, even in the harshest environment. Our strongest predictor of resiliency was the child's IQ, but because low IQ may reflect early deprivation or even brain damage, the mechanism of protection is unclear.

Also, this association should be interpreted cautiously until a longitudinal design permits the establishment of IQ prior to the potential cognitive impact of PTSD.

In the multiple regression analysis, increased morbidity was associated with witnessing serious domestic violence. Jaffe et al. (22) also identified the seriousness of witnessing family violence. This finding suggests that this form of psychological trauma is especially potent for the development of PTSD. In this regard, it is of interest that Mineka et al. (23) found that immature monkeys who viewed their mother's anxious response to a threat stimulus quickly learned to be afraid. In our study, virtually all family violence was directed at the child's mother, and it seems likely that the child witnessed both the family violence and the mother's distressed response to the violence. Furthermore, the aggressor was frequently not the legal or biological parent of the child. The experimental findings in animals and the clinical evidence point to the importance of the mother in the transmission of anxiety disorders. These observations are, also, consistent with those described by Tiet et al. (7) and Laor et al. (8) that were discussed in the introduction. The role of the mother in the transmission of anxiety disorders should be addressed directly in future studies.

It has often been suggested that abused children grow up to become abusing adults. This path, however, may be especially complex. Our examination of antecedent clinical signs found that children's aggressive behavior predated their physical abuse. In future work it will be important to examine the patterns surrounding scenes of physical trauma and defiant reactions. Children's interactions with adults and peers should be closely studied. These observations may provide empirical clues for the development of interventions designed to short-circuit the developmental path to becoming abusive adults by helping children channel their externalizing behavioral patterns into nonaggressive forms. These findings merit replication in a prospective longitudinal study. We must be careful not to blame the victim, and we do not mean to imply that the association between prior aggression and subsequent physical abuse indicates that the abuse represents an appropriate retribution. If the prior aggressiveness reflects externalizing behavioral patterns, it is possible to find alternate and more socially acceptable expression for these tendencies than frank aggression. It seems less likely that the trauma inflicted on the children reflects shared genetic factors, as many of the abusing adults were not blood relatives of the child.

Limitations on the interpretation of our results include the likely bias in subjects' recall of elements of the trau-

matic event. Our semistructured clinical interview was designed to determine systematic data in many areas. Unfortunately, features such as frequency and duration of stressors are difficult to evaluate reliably, especially in younger children. Also, variation in time delay between the trauma and onset of symptoms may confound the sequence of events, while the reactions of significant others can alter the course of subthreshold clinical pictures. Problems can be resolved, denied, or progress to threshold cases. In recalling historical data, the parent and the patient may confuse features that predated the qualifying stressor. Prospectively collected data in a longitudinal design could be interpreted with greater confidence.

In this group, when comorbidity was examined, those patients who met DSM-IV criteria for conduct disorder and oppositional disorder were less likely to develop full PTSD, especially compared to those with preexisting anxiety disorders. This finding supports the concepts of internalizing and externalizing disorders. Stress may cause those with externalizing reactive styles to manifest disturbances in different ways but not by developing an anxiety disorder.

DSM-IV presumes a causal path from exposure to a stressor to the development of PTSD, but that does not seem to be the case. Schnurr et al. (6) provided retrospective/prospective evidence of risk factors for the development of the PTSD syndrome after subsequent exposure to stress. Although it is possible that, in that unplanned study, the MMPI signs predicted exposure to more severe combat stress rather than (or in addition to) the PTSD reaction, such a path seems intuitively less likely. Our observations collected after the trauma converge with those of Schnurr et al. (6). These results suggest that preexisting anxiety predisposes to the development of PTSD, a relationship that is not surprising. Factors that predispose to one anxiety disorder may very well predispose to another. It cannot be determined from these data whether the exposure to trauma produces de novo anxiety signs or, rather, crystallizes the preexisting anxiety disorder.

A large subset of the subjects—almost half—did not develop any signs of PTSD, while a second group developed clinical signs, especially in the category of reexperiencing of the traumatic event. The subthreshold group was quantitatively different from the group with full PTSD in the areas of intrusive memories or dreams and qualitatively different from the full PTSD group in the development of avoidant behaviors and arousal symptoms. These more pathognomonic signs may thus provide important assessment and treatment targets. The intrusive thoughts seem, clinically, like obsessions and may be more amenable to pharmacologic treatment. The avoidant behaviors, as motor acts, may be more accessible to behavioral interventions. Although these suggestions are very speculative, such treatment approaches could be tested empirically.

It appears that the child at greatest risk for developing PTSD is the vulnerable anxious child who is exposed to vi-

olence, especially violence in the family. Identification of a child at risk in a provocative home situation would seem an important target for a preventive intervention. Treatment might be most effective if it were directed at preventing the development of avoidant behaviors and ameliorating psychophysiological activation. Our results implicate preexisting clinical conditions and individual constitutional factors in the response to extreme stressors.

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