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POST-TRAUMATIC STRESS DISORDER IN CHILDREN AND ADOLESCENTS

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In their seminal book, *Post-Traumatic Stress Disorder in Children*, Eth and Pynoos (1985) graphically illustrated the vulnerability of children and adolescents to urban and other violence. Subsequently, a panoply of investigations confirmed that exposure to high-magnitude threats (whether abuse, accidents, war, urban violence, or disasters) reliably predicted later psychopathology (defined categorically, as in PTSD, or dimensionally, as in effects on peer relationships or self-esteem) in young persons (Amaya-Jackson & March, in press; Terr, 1991). In *Children and Violence*, David Reiss and colleagues (1993) extended this necessary tradition to the specific topic of single-incident urban violence—its magnitude, effects, and implications for prevention and for treatment. Virtually all recent reviews decry the dearth of empirical research regarding individual and school-based treatments for chronic PTSD in young persons.

Although the variety of environmental events capable of producing PTSD varies somewhat between children and adults, effects of the stressor remain primary within and across a variety of settings—industrial and natural disaster, war, hostage taking, sexual assault, criminal victimization, and severe accidents (McNally, 1993). Unfortunately, there are no epidemiological studies that look specifically at the general population incidence or prevalence of PTSD in children and adolescents. However, PTSD prevalence is higher in youth exposed to life-threatening events, relative to non-exposed controls. Events that have been investigated include criminal assault (Pynoos et al., 1987), hostage taking (Terr, 1981), combat (Clarke et al., 1993), bone marrow transplantation (Stuber et al., 1991), naval disaster (Yule et al., 1990), and natural disaster (Green et al., 1991; McFarlane, 1987). For example, Green et al. found that 37% of 179 children aged 2 to 15 who were exposed to the Buffalo Creek dam collapse in 1972 showed probable PTSD symptoms 2 years after the disaster.

As it is in adults, risk for PTSD in children is strongly correlated with degree of exposure. In their study of children exposed to a schoolyard sniper attack, Pynoos and colleagues (1987) showed that exposure (proximity) was linearly related to the risk for PTSD symptoms, and Pynoos and Nader (1989) showed that children's memory disturbances, indicating distorted cognitive processing during the event, closely followed exposure. Confirming clinical experience, Saigh (1991) later showed that PTSD could result from direct, witnessed, or verbal exposure. Within a single event, choice of threshold for exposure and PTSD symptom cutoff also affects the rate of diagnosis (Schwarz & Kowalski, 1991). Once established, PTSD in children is usually chronic (Nader et al., 1990; Terr, 1983). In summary, despite methodologic uncertainties, the extant literature confirms that children and adolescents do indeed develop PTSD after traumatic events and that PTSD symptoms are strongly correlated with degree of exposure.

PTSD in children also resembles PTSD in adults (Pynoos et al., 1991). However, aspects of the symptom picture vary with child- and stressor-specific factors (Kendall-Tackett et al., 1993). Chronic physical and sexual abuse in childhood often results in severe psychopathology that bear's little relationship to the classic PTSD symptom picture (Kendall-Tackett et al., 1993). In this regard, although there is clear overlap between the categories, Terr (1991) makes the useful distinction between Type I trauma (sudden, unpredictable single-incident, that may be multiply repeated) and Type II (chronic expected repeated trauma, usually childhood physical and/or sexual abuse).

Traumatized children frequently exhibit symptoms of disorders other than PTSD, and children with other disorders not uncommonly have PTSD as an intercurrent diagnosis (Famularo et al., 1992). Besides true comorbidity, PTSD symptoms are often confounded by spurious comorbidity resulting from overlap between criteria sets (e.g., affective constriction in PTSD overlaps anhedonian depression) as well as confounding of other diagnoses by PTSD symptoms (e.g., the child who looks depressed and inattentive because of lack of sleep). Comorbidity does not necessarily imply a lack of discriminant validity, however (Atlas et al., 1991). In our study of children after the Hamlet fire, we showed that PTSD exacerbates or leads to disruptive behavior disorders (March et al., 1993). Similar results were noted after Hurricane Hugo (Lonigan et al., 1991) and in children suffering chronic maltreatment (Famularo et al., 1992). Because of the high prevalence of dimensional and transitional symptomatology, it is crucial to include these non-PTSD outcomes as targets for treatment and as predictors of treatment

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response in treatment outcome studies.

Although structured and semi-structured clinical interviews, such as the Diagnostic Interview Schedule for Children (Whitaker et al. 1990) and the Child and Adolescent Psychiatric Assessment (Angold, 1989), are *de rigueur* for assessing psychiatric problems in children and adolescents, these interviews only recently incorporated PTSD modules; reliability or validity data for PTSD are not yet available. While no inter-rater or test-retest reliabilities have yet been published, the Pynoos-Nader version of the Stress-Reaction Index, which has been widely used as a semi-structured interview (see for example, Pynoos et al., 1987; Schwarz & Kowalski, 1991; Stuber et al., 1991) and as a self-report measure (Lonigan et al., 1991; March et al., 1993), shows reasonable internal consistency and external validity. Self-report measures, such as the Children's Depression Inventory and the Multi-Dimensional Anxiety Scale for Children, which we piloted in our Hamlet study, can be used to assess internalizing comorbidity (March et al., 1993). We also found in our Hamlet study that teachers underestimate anxiety in children with PTSD. Nonetheless, parent/teacher reports are efficient adjuncts for assessing particularly externalizing collateral symptoms. With the caveat that parents in general are better at evaluating children's externalizing than internalizing symptoms, a multi-method multi-trait evaluation is preferable, usually including information from multiple sources (Amaya-Jackson & March, in press).

Very little is known about the role of risk and protective factors, associated mediating and moderating variables, and their interactions in the development of post-traumatic stress symptoms in young persons (Green et al., 1991). Demographic factors, the presence of psychiatric comorbidity, other life events, social cognition, and family functioning are potential predictor variables. Both positive and negative life events influence children's mental and physical health. Referring specifically to PTSD risk, Pynoos and Nader (1988) suggest that the effects of repeated traumas can be additive and in turn can seriously impair the child's ability to cope with PTSD itself. However, empirical evidence for this proposition is lacking. Several authors in Reiss' (1993) book provide thoughtful developmentally aware perspectives regarding risk analyses in trauma survivors. For example, Cicchetti and Lynch (1993) offer an ecological/transactional model of the causes and consequences of violence and abuse. In their model, child development is influenced by multiple levels of a child's environment, which are in turn seen as influencing each other. Garbarino and colleagues (1991) also provide a particularly nice review of war trauma in the context of threats to normal development.

Conaway and Hansen (1989) summarize a wide variety of social behaviors that have been reported to be abnormal in traumatized children, with problematic social behaviors serving both as a risk factor and outcome of traumatic experiences. Joseph et al. (1993) point out that locus of control may play a role either in the induction or in the maintenance of PTSD, since lack of personal efficacy is associated with chronic PTSD symptoms. We found similar results in our study of the aftermath of the Hamlet fire, with an external locus of control associated with gender (female) and race (black) above background rates in children with PTSD (March et. al., 1993).

Since trauma takes place in a neurodevelopmental context, attention to the interaction between trauma and developmental neurobiology is clearly imperative. However, apart from one study addressing startle response (Ornitz & Pynoos, 1989) and another of growth hormone (Jensen et al., 1991), biological factors have received little empirical attention in children and adolescents. In proposing a developmental model for trauma responses in youth, Trickett and Putnam (1993) provide a good review of the difficulty of assessing neurobiological variables in child and adolescent subjects.

Little is known about the treatment of children with PTSD; with few exceptions, the literature is filled with unsubstantiated case reports and theories of treatment based entirely on clinical experience. Based in large part on his own work in the area, Saigh (1992) recently made a persuasive case for the efficacy of cognitive behavioral psychotherapy (CBT) in treating single-incident trauma. Deblinger and colleagues (1990) also have shown that CBT benefits children with PTSD from sexual abuse. Nevertheless, mental health providers dealing with traumatized children and adolescents are inevitably forced to operate from clinical lore or to borrow treatments from other areas, such as CBT for overanxious disorder, or age-downward extension of trauma work in adults. We and others utilize a "prevention-intervention" model that incorporates triage for acutely exposed children, supporting and strengthening coping skills for anticipated grief/trauma responses, treating other disorders that may develop or exacerbate in the context of PTSD, and brief focused psychotherapy for chronic PTSD symptoms (Amaya-Jackson & March, in press; Pynoos et al., 1991). Central to almost all treatment strategies is an emphasis on reexposing the individual to traumatic cues under safe conditions, incorporating reparative and mastery elements in a structured, supportive manner. Since traumatic events and consequent PTSD symptoms frequently impair the child's family life, peer relationships, and school performance, it is important to address the child's current functioning in these areas. Comorbid symptoms, such as grief, guilt, anger, depression, anxiety, and behavioral disturbances are also appropriate targets for brief psychotherapy.

In summary, PTSD clearly occurs in children and adolescents, and may in fact be increasing in overall prevalence. PTSD in young persons strongly resembles the disorder in adults, with differences primarily stemming from divergent stressors, developmental themes, and collateral symptoms. Almost wholly unsupported by data-based research, current treatment involves debriefing, brief psychotherapy, and "pulsed" long-term intervention utilizing an admixture of psychodynamic, cognitive-behavioral, and perhaps pharmacological treatments.

REFERENCES

ANGOLD, A. (1989). **Structured assessments of psychopathology in children and adolescents.** In C. Thomson (Ed.), *The instruments of psychiatric research* (pp. 271-304). New York: Wiley.

WHITAKER, A., JOHNSON, J., SHAFFER, D., RAPOPORT, J.L., KALIKOW, K., WALSH, B.T., DAVIES, M., BRAIMAN, S. & DOLINSKY, A. (1990). **Uncommon troubles in young people: Prevalence estimates of selected psychiatric disorders in a nonreferred adolescent population.** *Archives of General Psychiatry, 47,* 487-496.

SELECTED ABSTRACTS

ATLAS, J.A., DI SCIPIO, W.J., SCHWARTZ, R. & SESSOMS, L. (1991). **Symptom correlates among adolescents showing posttraumatic stress disorder versus conduct disorder.** *Psychological Reports, 69,* 920-922. 21 adolescents with a primary diagnosis of PTSD, 24 Conduct Disordered, and 23 control adolescents were compared on measures of depression, anxiety, behavior problems, and fears. Analyses showed that posttraumatic adolescents showed associated symptoms of depression and state-anxiety, Conduct Disordered adolescents showed depressive trends, and both groups were evaluated by their teachers as showing significant behavior problems.

DEBLINGER, E., MCLEER, S.V. & HENRY, D. (1990). **Cognitive behavioral treatment for sexually abused children suffering post-traumatic stress: Preliminary findings.** *Journal of the American Academy of Child and Adolescent Psychiatry, 29,* 747-752. The present investigation examined the effectiveness of a cognitive behavioral treatment program designed for sexually abused children suffering PTSD. 19 girls who suffered contact sexual abuse and met DSM-III-R criteria for PTSD were included in the study. Subjects ranged in age from 3 to 16 years old. Structured interviews were conducted to assess the presence or absence of PTSD symptoms before, during, and following the abuse. Additionally, parents completed the Child Behavior Checklist, and subjects at least 6 years of age were administered the Child Depression Inventory and the Spielberger State-Trait Anxiety Inventory at the initial evaluation and again approximately 2 to 3 weeks later before the initiation of treatment. The baseline data collected at these two points were compared, and no significant changes were found over time. The above measures were readministered following 12 treatment sessions. The results revealed significant improvements at post-treatment on all measures.

ETH, S. & PYNOOS, R.S. (Eds.). (1985). **Post-traumatic stress disorder in children.** Washington, DC: American Psychiatric Press. Although the concept of PTSD has been derived primarily from studies of traumatized adults, the most promising applications for preventive intervention may well be in responding to the mental health needs of children. Further, work with children provides a convenient opportunity to study the relationship of the acute and chronic phases of this disorder while deepening our understanding of developmental processes in general. However, since the adoption of DSM-III, only a handful of psychiatrists have studied PTSD in children. The chapters of this book, originally presented at the 137th Annual Meeting of the American Psychiatric Association, held in Los Angeles in May 1984, assemble leading figures in this emerging field of child psychiatry. The contributors to this volume have focused on elucidating the childhood presentation of PTSD after a variety of traumatic occurrences. If there is one lesson we hope the readers of this volume will apply to their practice, it is an appreciation of the capacity of young children to explore their traumatic experiences, and the professional rewards of joining a child in this challenging task. [Adapted from Introduction]

GREEN, B.L., KOROL, M., GRACE, M.C., VARY, M.G., LEONARD, A.C., GLESER, G.C. & SMITSON-COHEN, S. (1991). **Children and disaster: Age, gender, and parental effects on PTSD symptoms.** *Journal of the American Academy of Child and Adolescent Psychiatry, 30,* 945-951. Abstracted in *PTSD Research Quarterly, 3(1),* 1992.

JENSEN, J.B., PEASE, J.J., TEN BENSEL, R. & GARFINKEL, B.D. (1991). **Growth hormone response patterns in sexually or physically abused boys.** *Journal of the American Academy of Child and Adolescent Psychiatry, 30,* 784-790. The ratio of growth hormone response to clonidine and L-dopa challenge was compared in 74 boys: 15 with purported physical abuse, 7 with purported sexual abuse, 13 normal controls, and 39 psychiatric controls. Sexually abused boys demonstrate a statistically significant elevated ratio of growth hormone response to clonidine versus response to L-dopa. Physically abused boys demonstrate lower clonidine/L-dopa growth hormone response ratios compared with controls. These effects widen with increasing physical development.

KENDALL-TACKETT, K.A., WILLIAMS, L.M. & FINKELHOR, D. (1993). **Impact of sexual abuse on children: A review and synthesis of recent empirical studies.** *Psychological Bulletin, 113,* 164-180. A review of 45 studies clearly demonstrated that sexually abused children had more symptoms than nonabused children, with abuse accounting for 15-45 percent of the variance. Fears, PTSD, behavior problems, sexualized behaviors, and poor self-esteem occurred most frequently among a long list of symptoms noted, but no one symptom characterized a majority of sexually abused children. Some symptoms were specific to certain ages, and approximately one third of victims had no symptoms. Penetration, the duration and frequency of the abuse, force, the relationship of the perpetrator to the child, and maternal support affected the degree of symptomatology. About two thirds of the victimized children showed recovery during the first 12-18 months. The findings suggest the absence of any specific syndrome in children who have been sexually abused and no single traumatizing process.

LONIGAN, C.J., SHANNON, M.P., FINCH, A.J., DAUGHERTY, T.K. & TAYLOR, C.M. (1991). **Children's reactions to a natural disaster: Symptom severity and degree of exposure.** *Advances in Behavior Research and Therapy, 13,* 135-154. Self-report data for 5,687 children ranging in age from 9 to 19 years were collected approximately three months after Hurricane Hugo devastated the rural community [Berkeley County, South Carolina] where the children lived. Information about the children's perceptions of hurricane severity, degree of home damage suffered as a result of the hurricane, and hurricane-related parental job loss was used to categorize children into four levels of hurricane exposure. Reports of anxiety were obtained via the Revised Children's Manifest Anxiety Scale (RCMAS) and reports of PTSD symptoms were obtained via the Reaction Index (RI). Significantly higher anxiety scores and significantly more PTSD symptomatology was found for children experiencing more severe exposure to the hurricane. Girls reported more anxiety and PTSD symptoms than boys, and black children were more likely than the white children to report PTSD symptomatology. Additionally, girls were more severely affected by increasing levels of hurricane exposure as indicated by their RI scores. These results indicate that, similar to adult and child victims of crime and adult victims of disaster, the development of PTSD symptoms in children exposed to a natural disaster is a function of the degree of exposure to the traumatic event. The results also suggest that children's trait negative affectivity may moderate the effects of exposure on the development of PTSD symptoms.

MARCH, J., AMAYA-JACKSON, L., COSTANZO, P., TERRY, R. & THE HAMLET FIRE CONSORTIUM. (1993, January). **Posttraumatic stress in children and adolescents after an industrial fire.** *Paper presented at the Lake George Conference on PTSD.* Using self- and teacher report measures, the authors surveyed fourteen hundred fourth to ninth grade students eight months after an industrial fire in a chicken processing plant in Hamlet, North Carolina, caused extensive loss of life. Principal components and confirmatory factor analyses, supplemented by item response theory analyses, identified three factors comprising posttraumatic symptomatology (PTS): reexperiencing, avoidance, and hyperarousal. The first two were highly correlated; hyperarousal only minimally so, perhaps because exposure was largely indirect. Exposure was positively correlated to PTS and to collateral symptoms. Race (black) and gender(female) were putative risk factors, especially with respect to collateral symptomatology. Locus of control was a putative mediating variable, especially in black subjects. Consistent with other literature on PTS in child subjects, these results indicate that PTS is a chronic condition that crosses multiple symptom domains beyond the core PTSD symptoms, with PTSD symptoms themselves strongly influenced by the nature of the stressor.

MCFARLANE, A.C. (1987). **Posttraumatic phenomena in a longitudinal study of children following a natural disaster.** *Journal of the American Academy of Child and Adolescent Psychiatry, 26,* 764-769. This longitudinal study examined the prevalence of posttraumatic phenomena and how they relate to symptomatic and behavioral disorders in a population of school children exposed to an Australian bushfire disaster. The prevalence of these phenomena did not change over an 18-month period, suggesting that they were markers of significant developmental trauma. The mothers' responses to the disaster were better predictors of the presence of posttraumatic phenomena in children than the children's direct exposure to the disaster. Both the experience of intrusive memories by the mothers and a changed pattern of parenting seemed to account for this relationship.

NADER, K. PYNOOS, R.S., FAIRBANKS, L. & FREDERICK, C.J. (1990). **Children's PTSD reactions one year after a sniper attack at their school.** *American Journal of Psychiatry, 147,* 1526-1530. 14 months after a sniper attack at an elementary school, level of exposure to that event remained the primary predictor of ongoing posttraumatic stress reactions in 100 school children who were followed up. Guilt feelings and knowing the child who was killed were associated with a greater number of symptoms. Grief reactions occurred independent of degree of exposure to the event. The authors discuss the public health implications of these longitudinal findings. Cited in *PTSD Research Quarterly, 1(3),* 1990.

ORNITZ, E.M. & PYNOOS, R.S. (1989). **Startle modulation in children with posttraumatic stress disorder.** *American Journal of Psychiatry, 146,* 866-870. Abstracted in *PTSD Research Quarterly, 1(1),* 1990.

PYNOOS, R.S., FREDERICK, C.J., NADER, K., ARROYO, W., STEINBERG, A., ETH, S., NUNEZ, F. & FAIRBANKS, L. (1987). **Life threat and posttraumatic stress in school-age children.** *Archives of General Psychiatry, 44,* 1057-1063. 159 children (14.5 percent of the student body) were sampled after a fatal sniper attack on their elementary school playground. Systematic self-reports of PTSD symptoms were obtained by use of a child PTSD Reaction Index. Analysis of variance revealed significant differences by exposure but not by sex, ethnicity, or age. Additional analyses were conducted of individual item response, overall severity of PTSD reaction, symptom grouping, and previous life events. The results provide strong evidence that acute PTSD symptoms occur in school-age children with a notable correlation between proximity to the violence and type and number of PTSD symptoms. Sampling at approximately one month after the trauma provided adequate delineation among exposure groups. The symptom profile of highly exposed children lends validity to the diagnosis of acute PTSD in childhood.

REISS, D., RICHTERS, J.E., RADKE-YARROW, M. & SCHARFF, D. (Eds.). (1993). **Children and Violence.** New York: Guilford Press. First published as a special edition of the journal *Psychiatry* (Vol. 56, no. 1, February 1993), the book opens with a review of the children and violence literature in the context of the NIMH Community Violence Project. In this and an ensuing data-based chapter, Richters et al. introduce impressive empirical rigor to the developmental epidemiology of urban violence and its psychological correlates. Among the more interesting findings: high rates of exposure, especially of witnessed events close to home and involving familiar persons; high rates of associated psychological distress; differential reporting of both events and distress by children (high) and parents (lower); and prominent age and gender effects on symptoms. Other chapters, notably those by Osofky and colleagues in New Orleans, and Bell & Jenkins, in Southside Chicago, echo these same themes. Trickett & Putnam provide a detailed developmentally-based model for the effects of childhood sexual abuse, focusing particularly on dissociation and on the effects of abuse on the HPA axis. Cicchetti & Lynch present an "ecological/transactional model" of community violence and its effects on child development. Norman Garmezy provides a concise discussion of risk and protective factors(and associated mediating and moderating variables), correctly pointing out that we need to understand those factors that predict resilience as well as vulnerability if we are to help our child patients. In a more speculative chapter, Robert Emde focuses on

the effects, mostly negative, of urban violence on moral development. And as David Reiss points out in his introduction, ameliorating the epidemic of American violence, and its untoward effects on young persons, clearly requires: (1) better information about the types and consequences of exposure to violent events suffered by children; (2) effective intervention strategies, encompassing primary, secondary, tertiary prevention; (3) and links between trauma research and developmental psychology and psychopathology.

SAIGH, P.A. (1992). **The behavioral treatment of child and adolescent posttraumatic stress disorder.** *Advances in Behaviour Research and Therapy, 14,* 247-275. The inclusion of PTSD in the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders has been associated with an exponential increase in the number of stress-related publications. Despite the increased literature base, it is of interest to note that the majority of these studies have involved traumatized adults (e.g., combat veterans or rape victims). Nevertheless, it is also of interest to note that child-clinical investigators have made conceptual and practical advances that are of considerable relevance to the study of child and adolescent PTSD. This review will primarily focus on interventions that have evinced efficacy over time with a wide range of traumatized patients. In so doing, historical, theoretical, and practical information relative to the use of flooding regimens is provided.

SCHWARZ, E.D. & KOWALSKI, J.M. (1991). **Posttraumatic stress disorder after a school shooting: Effects of symptom threshold selection and diagnosis by DSM-III, DSM-III-R, or proposed DSM-IV.** *American Journal of Psychiatry, 148,* 592-597. Objective: The purpose of the study was to investigate the effect of symptom threshold and criteria set selections on the diagnosis of PTSD in adults and children exposed to a man-made disaster and determine how well DSM-III and its successors agree.

Method: Data gathered in the course of a voluntary clinical screening for PTSD in 66 adults and 64 children 6 to 14 months after exposure to a school shooting were analyzed according to the DSM-III, DSM-III-R, and proposed DSM-IV criteria for PTSD diagnosis and cluster endorsement using liberal (occurring at least a little of the time), moderate (occurring at least some of the time), and conservative (occurring at least much or most of the time) symptom thresholds.

Results: Within DSM-III, DSM-III-R, and proposed DSM-IV, selection of liberal, moderate, and conservative symptom thresholds had robust effects on rates of diagnoses; liberal thresholds allowed the greatest frequencies of diagnosis. Compared with DSM-III and proposed DSM-IV, DSM-III-R generally diagnosed the fewest cases. Agreements between DSM-III-R and proposed DSM-IV were good, while agreements between DSM-III and its successors varied for children and adults.

Conclusions: Diagnostic rates and agreements were complexly influenced by interactions among thresholds and revisions in symptom clusters. The present study suggests that attempts to refine PTSD classification consider specification of symptom threshold intensity and supports the view that modification of criteria sets be undertaken with caution.

STUBER, M.L. NADER, K., YASUDA, P., PYNOOS, R.S. & COHEN, S. (1991). **Stress responses after pediatric bone marrow transplantation: Preliminary results of a prospective longitudinal study.** *Journal of the American Academy of Child and Adolescent Psychiatry, 30,* 952-957. This paper reports the preliminary findings of a longitudinal prospective study of young children undergoing bone marrow transplantation. Symptoms of post-traumatic stress were seen in these children up to 12 months after transplant. The bone marrow transplantation survivors demonstrated more denial and avoidance and fewer arousal symptoms than has been noted in children traumatized by a violent life threat, such as a sniper attack. These data suggest the use of post-traumatic stress as a model in understanding some of the symptoms of pediatric bone marrow transplantation survivors and may be applicable to other children exposed to the double life threat of serious illness and intensive medical intervention.

TERR, L.C. (1981). **Psychic trauma in children: Observations following the Chowchilla school-bus kidnapping.** *American Journal of Psychiatry, 138,* 14-19. 23 children involved in a school-bus kidnapping were studied from 5 to 13 months following the event. Each child suffered posttraumatic emotional sequelae. The author found that the children suffered from initial misperceptions, early fears of further trauma, hallucinations, and 'omen' formation. Later they experienced posttraumatic symptoms consisting of posttraumatic play, reenactment, personality change, repeated dreams (including predictive dreams and those in which they died), fears of being kidnapped again, and 'fear of the mundane.' Differences between child and adult response to psychic trauma are discussed.

TERR, L.C. (1983). **Chowchilla revisited: The effects of psychic trauma four years after a school-bus kidnapping.** *American Journal of Psychiatry, 140,* 1543-1550. A 4-year follow-up study of 25 school-bus kidnapping victims and one child who narrowly missed the experience revealed that every child exhibited post-traumatic effects. Symptom severity was related to the child's prior vulnerabilities, family pathology, and community bonding. Important new findings included pessimism about the future, belief in omens and prediction, memories of incorrect perceptions, thought suppression, shame, fear of reexperiencing traumatic anxiety, trauma-specific and mundane fears, posttraumatic play, behavioral reenactment, repetitions of psychophysiological disturbances that began with the kidnapping, repeated nightmares, and dreams of personal death. Brief treatment 5-13 months after the kidnapping did not prevent symptoms and signs 4 years later.

TRICKETT, P.K. & PUTNAM, F.W. (1993). **Impact of child sexual abuse on females: Toward a developmental, psychobiological integration.** *Psychological Science, 4,* 81-87. In the last decade, it has become clear that the sexual abuse of children is much more prevalent than previously realized and that such abuse has extensive mental health sequelae. Females are reported victims of sexual abuse much more often than males. The peak age of onset of sexual abuse for females is prepubertal — 7 or 8 years of age — and the average duration tends to be about 2 years. The basic theme of this article is that there may be directly traceable mechanistic relationships between the impact of sexual abuse on specific psychological and biological developmental processes for females and some of the adult outcomes of that abuse. Specifically, it is proposed that, to understand the long-term impact of sexual abuse, it is necessary to investigate how it may interfere with both the psychological and the biological processes of pubertal development.

ADDITIONAL CITATIONS
Annotated by the Editors

AMAYA-JACKSON, L. & MARCH, J. (in press). **Post-traumatic stress disorder in children and adolescents.** In H.L. Leonard (Ed.), *Child Psychiatric Clinics of North America: Anxiety Disorders.* Saunders: New York.

Reviews the diagnosis of PTSD in children and adolescents, paying particular attention to intrapsychic and behavioral phenomenology, differential diagnosis, contrasting theories of etiology, and psychotherapeutic and pharmacological treatment.

CICCHETTI, D. & LYNCH, M. (1993). **Toward an ecological/transactional model of community violence and child maltreatment: consequences for children's development.** In D. Reiss, J.E. Richters, M. Radke-Yarrow & D. Scharff (Eds.), *Children and violence* (pp. 96-118). New York: Guilford Press. (Also published as *Psychiatry, 56,* 96-118).

Presents a model of community violence and child abuse in which culture, community, family, and previous development influence each other, and in turn, influence development. Both potentiating and compensatory risk factors may operate at each level to determine the presence of violence, and ultimately positive versus negative outcomes.

CLARKE, G., SACK, W.H. & GOFF, B. (1993). **Three forms of stress in Cambodian adolescent refugees.** *Journal of Abnormal Child Psychology, 21,* 65-77.

Interviewed 69 Cambodian adolescents and young adults who had emigrated to the United States in order to determine predictors of PTSD and depressive symptomatology. Amount of war trauma predicted both outcomes, but more strongly for PTSD. Current life stress predicted only depressive symptoms, and resettlement stress predicted only PTSD.

CONAWAY, L.P. & HANSEN, D.J. (1989). **Social behavior of physically abused and neglected children: A critical review.** *Clinical Psychology Review, 9,* 627-652.

Reviewed the literature on social behavior of physically abused and neglected children. Methodological problems are cited as preventing clear inferences being drawn from some studies. However, the authors conclude that abused and neglected children are more likely than nonabused peers to have social behavior problems. Some differences between abused and neglected children are cited.

FAMULARO, R., KINSCHERFF, R. & FENTON, T. (1992). **Psychiatric diagnoses of maltreated children: Preliminary findings.** *Journal of the American Academy of Child and Adolescent Psychiatry, 31,* 863-867.

Administered the Diagnostic Interview for Children and Adolescents to 61 maltreated and 35 control children who ranged in age from 5 and 10 years. Maltreated children were more likely than control to have attention deficit hyperactivity disorder, oppositional disorder, and PTSD. Child and parent interviews did not always agree.

GARBARINO, J., KOSTELNY, K. & DUBROW, N. (1991). **What children can tell us about living in danger.** *American Psychologist, 46,* 376-383.

Argues that the chronic and ongoing traumatic stress associated with dangerous environments can produce PTSD and have significant impact on a child's worldview, social map, and moral development. The authors review fieldwork from locations including urban America, Cambodia, and Northern Ireland, and emphasize the importance of what they label adult-led "processing" of the child's environment for facilitating coping and moral development.

JOSEPH, S.A., BREWIN, C.R., YULE, W. & WILLIAMS, R. (1993). **Causal attributions and post-traumatic stress in adolescents.** *Journal of Child Psychology and Psychiatry and Allied Disciplines, 34,* 247-253.

Examined the relationship between causal attributions and post-traumatic symptoms among 13 adolescent survivors of the *Jupiter* cruise ship sinking who were thought to be at psychological risk 5 months after the disaster (Time 1). Internal locus of control at Time 1 was significantly correlated with depressive symptoms and PTSD symptoms at 12 months after the disaster.

MCNALLY, R.J. (1993). **Stressors that produce posttraumatic stress disorder in children (1st ed.).** In J.R.T. Davidson & E.B. Foa (Eds.), *Posttraumatic stress disorder: DSM-IV and beyond* (pp. 57-74). Washington: American Psychiatric Press.

Reviewed studies of PTSD in traumatized children. PTSD was consistently observed after war, criminal violence, burns, and serious accidents, but was less consistently observed after sexual abuse or disasters.

PYNOOS, R.S. & NADER, K. (1988). **Psychological first aid and treatment approach to children exposed to community violence: Research implications.** *Journal of Traumatic Stress, 1,* 445-473.

Discussed empirical findings on children's responses to community violence. The authors outline how psychological first aid should be conducted according to a child's age and grade level. The authors also propose strategies for intervening at the level of the classroom, the family, the individual, and the group.

PYNOOS, R.S. & NADER, K. (1989). **Children's memory and proximity to violence.** *Journal of the American Academy of Child and Adolescent Psychiatry, 28,* 236-241.

Examined the memory of 133 school-age children for a sniper attack at their school. When recalling the event, children who had been exposed to the attack minimized their degree of life threat, whereas children who had not been exposed actually increased their proximity to the attack.

PYNOOS, R., NADER, K. & MARCH, J. (1991). **Posttraumatic stress disorder.** In J. Weiner (Ed.), *Textbook of child and adolescent psychiatry* (pp. 339-348). Washington, DC: American Psychiatric Press.

Reviews the application of DSM-III-R criteria to the diagnosis of PTSD in children and adolescents. The authors provide specific examples of how symptoms may be manifested in an age-specific manner, e.g., reexperiencing phenomena as expressed in repetitive play. The authors also discuss treatment issues.

SAIGH, P.A. (1991). **The development of posttraumatic stress disorder following four different types of traumatization.** *Behaviour Research and Therapy, 29,* 213-216.

Examined PTSD in 230 Lebanese children who had been referred for mental health treatment after being exposed to trauma either directly, through observation, through verbal mediation, or by some combination of these pathways. All four groups had more

PTSD symptoms than non-clinical controls, but the clinical groups did not differ from each other.

TERR, L.C. (1991). **Childhood traumas: An outline and overview.** *American Journal of Psychiatry, 148,* 10-20.
Argues that childhood trauma is an important predictor of psychiatric disorder among children and adults. Four characteristics of childhood trauma that persist for long intervals include: visualized or repeated memories of the event; repetitive behaviors; trauma-specific fears; and changed attitudes about people, life, and the future. Childhood trauma is divided into Type 1, which includes detailed memories and misperceptions, and Type II, which include denial, numbing, dissociation, and rage.

YULE, W., UDWIN, O. & MURDOCH, K. (1990). **The 'Jupiter' sinking: Effects on children's fears, depression and anxiety.** *Journal of Child Psychology and Psychiatry and Allied Disciplines, 31,* 1051-1061.
Studied psychiatric symptoms in 25 female adolescent survivors of the *Jupiter* cruise ship disaster, 46 girls from their school who had not wanted to go on the cruise, 13 girls who had wanted to go but could not get places, and 71 controls from a different school. Survivors reported more fears of stimuli related to the traumatic event than did the other groups, but survivors were not more generally fearful. Survivors also reported the most depression, anxiety, and physiological arousal of all four groups.

PILOTS UPDATE

USING THE PILOTS THESAURUS

In the last "PILOTS Update," we described natural-language searching and controlled-vocabulary searching, the two basic approaches to using the PILOTS database. In this column, we'll look at the *PILOTS Thesaurus*, which sets forth the special indexing vocabulary used in the database.

The controlled vocabulary is not a concept limited to bibliographical work. Whether it be the definitions contained in the official rules of baseball or the nomenclature prescribed in the *Diagnostic and Statistical Manual of Mental Disorders*, a controlled vocabulary will come into being whenever there is a need to standardize the terminology used by a group of people working toward a common end.

The *PILOTS Thesaurus* consists of a list of more than seven hundred terms ("descriptors") arranged so as to show the relationships among them. When we index a document, we select from the Thesaurus the terms that best describe its form and content. When you search the PILOTS database, you can use the Thesaurus to find terms that best describe the material you are looking for. In theory—and surprisingly often in practice—when your search terms match our index terms you will have identified those papers most relevant to your need.

This list of terms is presented in two ways in the *PILOTS Thesaurus*: as a hierarchical table and as an alphabetical index.

The *hierarchical table* structures our examination of each document that we index by leading us to ask and answer these questions:

- What event caused the phenomena discussed in this paper?
- Who was affected by it?
- What effects did the event have on the person(s) affected?
- What was done to prevent or mitigate those effects?
- What techniques were used to measure or study the situation described?
- What issues of public policy were dealt with?
- In what special form was the work reported?

Seven alphabetical lists (Stressors, Affected Persons, Effects, Treatment, Scientific Research and Development, Policy Issues, and Literary Formats) contain general terms for these areas. These, in turn, are divided and subdivided, so that the level of specificity with which a particular paper deals with these areas can be reflected in our indexing.

For example, an article on the treatment of PTSD might deal with "Treatment" in general, or with "Organic Therapies," or more specifically with "Drug Therapy." It might concentrate on one type of drug therapy, such as "Antidepressant Drugs," or on one of these in particular, such as "Tricyclic Derivatives." Each of these terms represents a narrowing of the concept mentioned immediately before, which the *PILOTS Thesaurus* indicates by means of indentation:

Treatment
  Organic Therapies
    Drug Therapy
      Antidepressant Drugs
        Tricyclic Derivatives

By examining the hierarchical table, you can locate terms with which to search the database, even if you don't know what terms our vocabulary might use.

The hierarchical table is especially useful in ensuring that you will locate all the papers that deal with your subject. Using the example above, let's say that you are looking for papers on the use of antidepressant drugs in treating PTSD. "Antidepressant Drugs" is an obvious descriptor to use; but you might also want to look at those papers that deal with specific categories of antidepressants, which would be indexed under more specific descriptors rather than the more general one. Unfortunately, the PILOTS database does not yet offer an "explode" capability—if you want to search on a descriptor and its narrower terms, you must enter all of those terms. In our example, you would use "Antidepressant Drugs OR Atypical Agents OR Monoamine Oxidase Inhibitors OR Serotonin Uptake Inhibitors OR Tricyclic Derivatives" as your search statement.

The *alphabetical index* to the Thesaurus lists not only the 700-odd PILOTS descriptors but also a large number of other terms that users might have in mind when they think of using the database. For each descriptor, the alphabetical index lists the terms immediately above and below it ("broader terms" and "narrower terms") in the hierarchy, as well as other descriptors that should be considered in searching ("related terms"). For each word in the list that isn't a PILOTS descriptor, the appropriate descriptor is shown. So, if you know a term that describes to your satisfaction the material you are looking for, you can look up that term in the alphabetical index to the *PILOTS Thesaurus*, and be guided to the descriptor to use in searching the PILOTS database.

The traumatic stress field is producing a rapidly growing, interdisciplinary literature. There will be many cases in which useful papers are written by people from other fields (or other countries) whose customary terminology is unfamiliar. Controlled-vocabulary searching is one of the best ways to overcome these difficulties; and the *PILOTS Thesaurus* is the key to the controlled vocabulary that we use in indexing the PTSD literature.

In our last column, we described a PILOTS search as "an exercise in pattern matching." By using the *PILOTS Thesaurus*, you can ensure that the pattern that you are trying to match actually exists within the database, and increase your chances of finding the papers you need for your research or clinical work.

PTSD RESEARCH AT THE MINNEAPOLIS VAMC

Brian Engdahl, Ph.D. & Raina Eberly, Ph.D.

Following publication of DSM-III in 1980 and the implementation of the Former Prisoner of War Act of 1981, the study of PTSD among POWs began in earnest. The POW act mandated medical and mental health examinations for POWs. To date, more than 600 POWs have completed exams at the Minneapolis VAMC, representing over 75% of the POWs known to be living in our area. These remarkable people were exposed to the trauma of combat and capture, and the hardships of captivity. Nationwide, approximately 68,000 of these "hardy survivors" remain alive. PTSD lifetime rates as high as 70% have been reported (Eberly et al., 1991), and current PTSD rates are estimated to be 20-27% (Engdahl et al., manuscript submitted for publication). Strong relationships between captivity hardships and later PTSD exist (Speed et al., 1989). Comorbidity with other psychiatric disorders also is high among POWs (Engdahl et al., 1991).

In 1985, Dr. Charles Stenger, former Chief Psychologist in VA Central Office, directed us to a non-profit foundation that provided initial grant support for analyses of POW exam data, providing the base for securing our current VA Merit Review project. We are evaluating community samples of POWs and combat veterans of WWII and the Korean conflict. Using psychological tests plus the Structured Clinical Interview for DSM-III-R (SCID) NP, SCID-II, and PTSD modules. In collaboration with Drs. Mark Mahowald and Thomas Hurwitz of the Minnesota Regional Sleep Disorders Center, selected subjects also undergo sleep evaluations and extended evaluation of their activity patterns. Our preliminary results indicate pervasive differences in arousal between PTSD cases and controls. PTSD cases show reduced time in bed, reduced sleep, reduced REM latency, and increased sleep movement, respirations, and heart rate. Mild to significant sleep apnea is frequent among the PTSD cases, and its treatment appears to decrease daytime PTSD symptom intensity. We and Dr. Jose Pardo are studying emotional processing in subjects with and without PTSD. This pilot study uses psychophysiologic and Positron Emission Tomography technology.

In 1989 we began collaborating with the National Academy of Science's Medical Follow-Up Agency (MFUA) and its director, Dr. William Page. Under VA contract for 40 years, MFUA has conducted multiple studies of a national sample of POWs and combat control subjects. Successive surveys and exams have provided information about morbidity, mortality, and psychiatric symptoms for these WWII and Korean conflict veterans. The extraordinary persistence of PTSD and depressive symptoms, especially among the POWs, is reported in papers noted below. Exposure to captivity trauma, and individual factors such as age, education, and social support are related to POWs' later psychiatric symptoms. Symptom change over time is being examined. Recent MFUA and Minneapolis data allowed comparisons of multiple PTSD assessment methods among community samples of older veterans (Engdahl et al., manuscript submitted for publication). The Mississippi Scale for Combat-Related PTSD and unstructured clinical interviews displayed equal discriminant validities, although both yielded somewhat higher estimates of current PTSD than did the SCID.

Clinical activities are carried out by a Post-Traumatic Stress Disorder Clinical Team headed by Harry Russell, Ph.D., and Stephen Barton, M.D., and a new Evaluation and Brief Treatment PTSD Inpatient Unit staffed by Scott Sponheim, Ph.D., and Karen Wahmenholm, M.D. Dr. Joseph Westermeyer, Chief of Psychiatry Service, provides expertise in cross-cultural psychiatry and post-traumatic adjustment problems; Jonathan Uecker, M.D., has interests in the forensic implications of PTSD. Others involved in PTSD clinical and research efforts include Daniel Sandstrom, M.A. and Paul Arbisi, Ph.D. Support is being sought for a clinical center geared toward POWs with PTSD. This would allow development and evaluation of treatment for these older veterans.

Selected Bibliography

EBERLY, R.E. & ENGDAHL, B.E. (1991). **Prevalence of somatic and psychiatric disorders among former prisoners of war.** *Hospital and Community Psychiatry, 42,* 807-813.

EBERLY, R.E., HARKNESS, A.R. & ENGDAHL, B.E. (1991). **An adaptational view of trauma response as illustrated by the prisoner of war experience.** *Journal of Traumatic Stress, 4,* 363-380.

ENGDAHL, B.E. & EBERLY, R.E. (in press). **The course of chronic PTSD.** In T.W. Miller (Ed.), *Stressful life events* (2nd edition). New York: International Universities Press.

ENGDAHL, B.E., HARKNESS, A.R., EBERLY, R.E., PAGE, W.F. & BIELINSKI, J. (1993). **Structural models of captivity trauma, resilience, and trauma response among former prisoners of war 20 to 40 years after release.** *Social Psychiatry and Psychiatric Epidemiology, 28,* 109-115.

ENGDAHL, B.E., PAGE, W.F. & EBERLY, R.E. (1993). **The assessment of chronic PTSD among older veterans via clinical interview, structured interview, and questionnaire.** Manuscript submitted for publication.

ENGDAHL, B.E., SPEED, N., EBERLY, R.E. & SCHWARTZ, J. (1991). **Comorbidity of psychiatric disorders and personality profiles of American World War II prisoners of war.** *Journal of Nervous and Mental Disease, 179,* 181-187.

PAGE, W.F., ENGDAHL, B.E. & EBERLY, R.E. (1991). **Prevalence and correlates of depressive symptoms among former prisoners of war.** *Journal of Nervous and Mental Disease, 179,* 670-677.

SPEED, N., ENGDAHL, B.E., SCHWARTZ, J. & EBERLY, R.E. (1989). **Posttraumatic stress disorder as a consequence of the POW experience.** *Journal of Nervous and Mental Disease, 177,* 147-153.

WESTERMEYER, J. & WAHMENHOLM, K. (1989). **Assessing the victimized psychiatric patient.** *Hospital and Community Psychiatry, 40,* 245-249.