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IMPACT OF MASS SHOOTINGS ON SURVIVORS, FAMILIES, AND COMMUNITIES

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On April 16, 2007, a student at Virginia Technological Institute shot and killed 32 people and wounded at least 25 others before taking his own life. The rampage in Norris Hall generated unthinkable horror and incredible heroism, as many faculty and students lost their lives trying to protect others. The incident rekindled national debates on mental illness and dangerousness, violence prevention and response, and the role of the media. Questions immediately arose about what the psychological impacts of the shootings would be on the survivors, witnesses, their families, first responders, and the entire Virginia Tech community.

Research on mass shootings is not extensive but is sufficient to allow preliminary conclusions about (1) the prevalence, persistence, and predictors of post-shooting PTSD; (2) the nature of survivor and community concerns; and (3) lessons learned for response. Fifteen events were identified whose consequences have been studied empirically or reviewed systematically. Within these three broad themes, this review is organized by event. There are three reasons for this choice. First, specific studies typically spanned multiple survivor groups, including the injured, eyewitnesses, parents, teachers and, occasionally, the community. Second, each event (and population studied) has unique elements that shape how well the findings may or may not generalize to other events (and populations), such as a shooting on a college campus. Third, the focus on events helped to illustrate how researchers have attempted to study these events – who was studied, how a control or comparison group was found, and why many (but not all) of these studies were small. The bibliography includes relevant examples from public spaces, workplaces, and schools, and it focuses on critical incidents rather than on ongoing school or community violence.

Prevalence, Persistence, and Predictors of Post-Shooting PTSD

Queen Street Shootings. On December 8, 1987, nine people died and five more were wounded by a gunman in a city office building in Melbourne, Australia. The gunman shot at many others, but the gun was not working properly. Some employees barricaded themselves into their offices, fearing for their lives. After he was captured, the man broke free, climbed out a window, and fell to his death. Creamer and colleagues (1993) collected self-report data from 447 employees 4, 8, and 14 months post-shooting (the trauma group). Employees from another office building in Melbourne served as the contrast group. The trauma group scored much higher than the contrast group on intrusion, avoidance, depression, anxiety, and other psychological symptoms. Symptoms lessened over time, but many of the effect sizes remained quite large.

Creamer and colleagues also analyzed the influence on symptoms of a variety of "vulnerability" and "recovery" factors. Vulnerability factors included gender, subjective experience of trauma, and other stressful life events. Recovery factors included perceived social support, receipt of individual counseling, and avoidance of the affected floors. In longitudinal analyses, early symptoms were strong predictors of later symptoms. This study was important for documenting the range of outcomes that can emerge after mass trauma, the persistence of symptoms for many, and the importance of subjective experience and subsequent stressors, findings that have since been replicated in a number of disaster studies (see Norris, Friedman & Watson, 2002a; Norris, Friedman, Watson, Byrne, et al., 2002b).

Cafeteria Shootings. On October 16, 1991, a man drove his truck into a cafeteria in Kileen, Texas and proceeded to shoot and kill 24 customers and injure many others. After being cornered by police, the gunman fatally shot himself. The impact of this event was studied by North and colleagues at points one month, one year, and three years after the disaster.

North et al. (1994) described the initial results for 136 persons, including cafeteria employees, customers, and first responders. On the basis of the Diagnostic Interview Schedule (DIS) for DSM-III-R, 28% met criteria for current PTSD, which was the most prevalent disorder. Few had no symptoms of posttraumatic stress. Most of those suffering from PTSD related to the shooting had no prior history of psychiatric illness. However

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having had a prior history of PTSD or major depression did substantially increase the risk of shooting-related PTSD in women. Depression was often co-morbid with PTSD.

One year later, North and colleagues (1997) found the prevalence of current PTSD to have declined to 18%. Participants who recovered from PTSD by follow-up did not differ from those who had not recovered in number of symptoms at index or on any demographic variable. The prevalence of current PTSD did not change significantly between one and three years (North et al., 2002). North and colleagues (2001) found that talking about the incident, staying active, seeking social support, and seeking information about the event are all potentially helpful strategies for coping with the aftermath of a mass shooting.

Courthouse Shooting Spree. In May 1992, during closing arguments of a divorce proceeding, the husband shot his wife, their lawyers, the judge, and several others in a courthouse in St. Louis, Missouri. His wife died, and five others were wounded. Johnson et al. (2002) studied 80 courthouse employees 6-8 weeks after the incident, of whom 77 were re-interviewed one and three years later with the DIS for DSM-III-R. Ten percent were injured, 25% witnessed death or injury, and 51% thought they might die. Twenty participants (25%) met criteria for a postdisaster disorder, but only 8 participants (10%) had new disorders. Much larger percentages reported subthreshold levels of posttraumatic stress. Of the four PTSD cases, all but one was remitted by the end of the study.

School Sniper Attack. On February 24, 1984, a sniper opened fire on children in an elementary school playground in Los Angeles, California. One girl was killed, and 13 other children and a playground supervisor were wounded. The sniper committed suicide. The school was on a year-round schedule, with one fourth of the students out ("off track") at the time. Nader and colleagues (1990) described the results for 159 children divided into four groups: on the playground, in school, not in school, and off track. At Month 1, specific PTSD symptoms were highly prevalent, but by Month 14, only the playground group remained highly distressed. Acquaintance with the girl who was killed was predictive of symptoms primarily among students who were not on the playground. Many students reported that the incident interfered with their learning.

Evanston School Shooting. On May 21, 1988, a woman entered an elementary school in an affluent suburb of Chicago and killed one child and wounded five others in front of their classmates. Children and teachers were kept in their classrooms for hours afterwards until it was learned that the shooter committed suicide in a nearby home. Schwarz and Kowalski (1991) studied 24 school personnel (6-8 months post-shooting) and 42 parents and 64 children (8-14 months post). When they used a moderate severity threshold, DSM-III-R PTSD rates were 19% for adults and 27% for children.

Thurston High School Shooting. On May 21, 1998, a student opened fire into a school cafeteria in Springfield, Oregon, killing two and injuring 26 others. Two years later and with the cooperation of the registrars of three Oregon colleges, Curry (2003) sent mail questionnaires to college students who had graduated from Thurston or another selected control high school. Of the 539 surveys sent, 80 were returned. The sample included Thurston students in May 1998 who were in the vicinity of the shooting, on campus that day, or away from school; Thurston students who had graduated by that time; and 24 controls. Respondents who were physically closer to the shooting reported higher peritraumatic dissociation, posttraumatic stress, and alexithymia (difficulty expressing emotion) than graduates or controls. Among participants who were not on campus that day, emotional proximity was related to outcomes.

Brooklyn Bridge Shooting. On March 1, 1994, a gunman in a car fired 30 shots at a van transporting 15 Hasidic yeshiva students. The driver of the van was fired on repeatedly. One student was killed instantly and three others were wounded, one critically. Eleven of the 15 boys were evaluated by Trappler and Friedman (1996) two months post-shooting. Four of the eleven were diagnosed with PTSD and major depression. Compared to an age-matched group of 11 students from the same yeshiva, the attacked students also scored more highly on several self-report scales of depression, anxiety, and posttraumatic stress. The authors noted that the cohesiveness of the group (often considered a protective factor) may have heightened their vulnerability, because students' grief was intense.

Nature of Survivor and Community Concerns

McDonald's Massacre. In July 1984, a man walked into a McDonald's restaurant in San Ysidro, California, and began shooting employees and customers, killing 21 and injuring 15 others. Hough and colleagues (1990) studied the impact of this event on the surrounding community by interviewing 300 women 6-9 months postevent. Almost all of the women were aware of the shooting, and 100 reported that it had affected their lives considerably or very much. Many residents felt exploited by the media. Conflicts arose over the possibility of a survivors' fund and how it should be managed. However, numerous religious services and mental health relief efforts provided people with opportunities to support one another. The women who were most severely affected expressed great concern for the children who were victims and perceived the world as more dangerous than before.

East County School Shootings. On March 5, 2001, a student at Santana High School in San Diego, California, killed two people and injured 13 others. Three weeks later, a student at a nearby high school shot and injured five. Palinkas and colleagues (2004) studied these events using "rapid assessment procedures," a community-based research approach designed to provide deeper understanding of the event and its context. The researchers in-

terviewed key informants representing the experiences of students, teachers and school administrators, service providers, parents, and community leaders. Of the 85 people interviewed, substantial percentages provided personal and community-wide evidence of intrusive, avoidance, and arousal symptoms. Distress at exposure to media was very common and accompanied by considerable resentment of the media for uncritically assuming that bullying led to the shooters' behavior and for intruding into their lives. Many informants expressed the desire to forget about the event, to return to a normal life. Interest in school activities diminished, and absenteeism rose. There was widespread reluctance to discuss the shootings and guilt over this very reluctance. Feelings of helplessness with regard to prevention were also widespread. Anger was common, although not usually directed at the shooters themselves, who sometimes were viewed with some sympathy. Many students were unusually irritable with one another, and parents sometimes expressed anger at the school district for failing to prevent the incident. Faculty were fragmented over the issue. Palinkas and colleagues noted that these community reactions might hinder implementation of effective prevention and treatment strategies.

Columbine High School Shootings. On April 20, 1999, two students in Littleton, Colorado, killed 12 students and one teacher and injured 20 others before shooting themselves. About 300 people were trapped in the school for hours. Hawkins and colleagues (2004) interviewed four students and seven parents but then had to suspend the study because of several negative events in the Columbine area. Almost all participants reported feeling numb immediately after the shootings, but negative feelings (nervousness, guilt, irritability) arose strongly over the next two weeks. Ruminations were troubling and often focused on what they could have done to prevent the attack. The media were seen as intrusive and a source of further distress. The students and parents also reported positive feelings, including intense affection for one another.

The consequences of Columbine went far beyond Littleton. Lawrence and Birkland (2004) provided a fascinating glimpse into the various ways the problem was framed in the media, including inadequate gun control, inadequate school security, inadequate parental involvement, and "pop culture," such as violent content in video games. Columbine generated the most intense period of legislative activity on school violence ever.

Lessons Learned

Port Arthur Shootings. On April 28, 1996, a man shot and killed 35 people at a café in a busy historic, tourist site (Port Arthur) on the Tasmanian peninsula in Australia. The offender was taken into custody the following morning after holding police at bay overnight. The local community was severely affected by the deaths of friends and collapse of the tourism economy. Lessons learned were shared in an interesting series of articles in the *Australian Journal of Emergency Management*, each told from the perspective of a different actor in the response and recovery efforts (see, for example, Burgess, 1998; Fielding, 1998). Themes of local direction of recovery and roles of outsiders were pervasive in this series. Included in the variety of issues discussed were security of public places, strain on communications, media management, staff stress and turnover, the complexities of helping survivors who are also witnesses to a serious crime, and impacts of relief workers on local communities.

Pearl, MS, School Shooting. On October 1, 1997, a student in Pearl, Mississippi killed two students and wounded seven others. Lyons (2001a; 2001b) described the various interventions organized by the school district for faculty and students, and highlighted the debate surrounding whether outside disaster specialists or local mental health workers unfamiliar with disaster work should be relied on in crises like these. Either way, it is important to turn the response over to school personnel as soon as possible. Mental health professionals can also play a role with local and national media to ensure that helpful and accurate information is provided to the public.

Summary and Conclusions

The psychological consequences of directly experiencing or witnessing a mass shooting are often serious. Prevalence of postdisaster diagnoses (predominantly PTSD) in these studies ranged from 10% to 36%. Much higher percentages reported subthreshold PTSD, and very few participants reported no symptoms. Effect sizes were large in comparative studies and often persistent in longitudinal studies. As a whole, these studies fell into the severe category in a larger review of the disaster literature that classifies disaster effects as minimal, moderate, severe, and very severe (Norris et al., 2002a; 2002b). The weight of the evidence suggests that primary victims should be offered psychosocial interventions, such as that described by Creamer et al. (1991) and Wong and colleagues (2007). Mental health planners should proceed carefully, however, as the ubiquity of counseling offers in the immediate aftermath of these events was often resented. Local involvement and control are paramount.

At less severe levels of exposure, the impacts of mass shootings extend far beyond the primary victims to encompass the community, whether that is a workplace, neighborhood, school, or campus. Community members resent the media intrusion, the sense that they are being blamed for the violence, and the convergence of outsiders. The reluctance of some members to focus on the event, while others need to, is consistent with community dynamics observed after other types of disasters (Norris et al., 2002a; Norris et al., 2002b).

This review has focused on the consequences of mass shootings rather than on their precursors or prevention. Readers interested in prevention and response planning should consult the website of the Readiness and Emergency Management Initiative of the U.S. Department of Education, http://www.ercm.org.

REFERENCES

NORRIS, F.H., FRIEDMAN, M.J., & WATSON, P.J. (2002a). **60,000 disaster victims speak: Part II. Summary and implications of the disaster mental health research.** *Psychiatry, 65,* 240-260.

NORRIS, F.H., FRIEDMAN, M.J., WATSON, P.J., BYRNE, C.M., DIAZ, E., & KANIASTY, K. (2002b). **60,000 disaster victims speak: Part I. An empirical review of the empirical literature, 1981 – 2001.** *Psychiatry, 65,* 207-239.

ABSTRACTS

CREAMER, M., BURGESS, P., BUCKINGHAM, W., & PATTISON, P. (1993). Posttrauma reactions following a multiple shooting: A retrospective study and methodological inquiry. In J.P. Wilson and B. Raphael (Eds.), *International handbook of traumatic stress syndromes* (pp. 201-212). New York: Plenum. The current research sought to investigate the psychological effects of a multiple shooting, as well as identifying those factors that may predispose an individual to the development of posttrauma reactions. A three-stage, prospective research design was utilized. [Adapted from Text, pp. 201-202]

CURRY, V. (2003). **Thurston High School: The effects of both distal and emotional proximity in an acute instance of school violence.** *Journal of School Violence, 2,* 93-120. On May 21, 1998, Kipland Kinkel entered Thurston High School in Springfield, Oregon, gunned down two students and injured scores more, after mudering his parents the night before. There is a dearth of research focused on the effects of such violence in school settings where the perpetrator is a peer of his victims. We do not know if, how, or under what circumstances adolescents exposed to this violence are psychologically changed, or if the changes are temporary or long-lasting. This study explores the incidence of post-traumatic effects of such an incident. These effects are hypothesized to be influenced by both distal (physical) and emotional proximity. Emotional proximity is, in this study, measured by connectedness to the school. Effects of peritrauma dissociative responses in the immediate aftermath of the incident on longitudinal effects are also explored. Participants include 80 respondents who completed a lengthy survey at two to three years post incident. The sample was predominantly recruited from three Oregon institutes of higher learning. It includes adolescents who were enrolled at Thurston High School at the time, young adults who had graduated from Thurston in the five years prior to the incident, and a control group from another college town 40 miles away. Findings support the hypotheses that distal proximity at the time of the event predicts the longitudinal direct effects of distress from hyper arousal, intrusions, and avoidance. Controlling for distal proximity, emotional proximity to Thurston High School predicts peritrauma dissociative response and alexithymia. Further, elevated peritrauma scores predicts distress from intrusions at two to three years. These results suggest there can be long-lasting effects from one instance of acute violence. Limitations of the study and future research are discussed.

HAWKINS, N.A., MCINTOSH, D.N., SILVER, R.C., & HOLMAN, E.A. (2004). **Early responses to school violence: A qualitative analysis of students' and parents' immediate reactions to the shootings at Columbine High School.** *Journal of Emotional Abuse, 4(3/4),* 197-223. On April 20, 1999, two angry students attacked Columbine High School. The unprecedented murder/suicide resulted in 15 deaths, more than 20 injuries, and thousands of psychologically traumatized individuals. We present a qualitative analysis of interviews conducted two weeks after the incident with 4 Columbine High School students and 7 parents who were directly and indirectly affected. Findings highlight both similarities and variability in immediate emotional, cognitive, and social responses to the mass violence. Helpful and unhelpful support attempts are noted. Implications of the media's heavy involvement in sensational traumas are discussed, emphasizing important considerations for future research on the psychological effects of school violence.

HOUGH, R.L., VEGA, W., VALLE, R., KOLODY, B., GRISWALD DEL CASTILLO, R., & TARKE, H. (1990). **Mental health consequences of the San Ysidro McDonald's massacre: A community study.** *Journal of Traumatic Stress, 3,* 71-92. This paper reports on the reactions of a portion of the population of San Ysidro, California, to the McDonald's massacre in 1984. Recently immigrant, poor, Mexican American women, 35-50 years of age, who were not directly involved in the accident, were surveyed to determine their emotional reactions approximately 6 months following the massacre. Approximately one third of the women indicated they were seriously affected by the event. Some 12% reported had mild or severe levels of PTSD symptomatology at some point in time since the massacre and some 6% still felt symptoms 6 to 9 months after the event. The women most affected were those having relatives or friends involved in the massacre and those with general social vulnerability (e.g., the widowed, separated, or divorced, unemployed and those with less income and fair to poor health). These women reported relatively little impact on their children. Onset and chronicity of PTSD and health care utilization patterns were also explored. Results of more intensive, open ended interviews with the women most affected by the event are summarized.

JOHNSON, S.D., NORTH, C.S., & SMITH, E.M. (2002). **Psychiatric disorders among victims of a courthouse shooting spree: A three-year follow-up study.** *Community Mental Health Journal, 38,* 181-194. This study examined the longitudinal course of psychiatric sequelae of a mass shooting incident at a courthouse. A sample of 80 individuals was examined 6-8 weeks after the incident and 77 of these were reassessed one and three years later using the Diagnostic Interview Schedule/Disaster Supplement. Only 5% of the study sample met criteria for PTSD after this incident. Universal distress, however, was evident as 96% of the respondents reported PTSD symptoms and 75% described the incident as "very upsetting." The need for intervention among symptomatic individuals not meeting diagnostic criteria should not be discounted as subdiagnostic distress may warrant specific intervention.

LAWRENCE, R.G., & BIRKLAND, T.A. (2004). **Guns, Hollywood, and school safety: Defining the school-shooting problem across public arenas.** *Social Science Quarterly, 85,* 1193-1207. *Objective:* Research in agenda setting has demonstrated that dramatic news events can drive particular issues to the top of the media and government agendas. The objective of this study is to analyze how different aspects of an event-driven problem compete for attention in those arenas. Me*thods*: The method is content analysis of media coverage and congressional legislative activity following the 1999 Columbine High School

shootings. *Results:* The results show that while both agendas converged on the gun-control aspect of the problem, they substantially diverged on other understandings of what kind of problem the Columbine shooting represented and how to address it. *Conclusions:* We conclude that the differing institutional structure and incentives of the news media and Congress can create or inhibit interinstitutional positive feedback in the problem defining process. Agenda divergences are amplified when prominent politicians cue the media to follow particular story lines that depart from the actual legislative activity.

LYONS, J.A. (2001a). **Drawing on local expertise to meet mental health needs after a school shooting.** *Texas Journal of Rural Health, 19(1),* 6-13. Following a shooting at the high school in Pearl, Mississippi [in October 1997], local resources were quickly convened to address mental health needs. The present article provides an overview of the interventions organized by the school district. Strategies for addressing concerns regarding the intervention philosophy, credentials, and liability coverage of volunteers are discussed. The roles played by emergency services critical incident debriefing team members, mental health professionals, school counselors, teachers, school nurses, and local clergy are described.

NADER, K., PYNOOS, R., FAIRBANKS, L., & FREDERICK, C. (1990). **Children's PTSD reactions one year after a sniper attack at their school.** *American Journal of Psychiatry, 147,* 1526-1530. Fourteen 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 schoolchildren 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.

NORTH, C.S., MCCUTCHEON, V., SPITZNAGEL, E.L, & SMITH, E.M. (2002). **Three-year follow-up of survivors of a mass shooting episode.** *Journal of Urban Health, 79,* 383-391. This report describes a 3-year follow-up study of survivors of a mass shooting incident. Acute-phase and 1-year follow-up data from this incident have been previously reported. The Diagnostic Interview Schedule/Disaster Supplement was used to assess 116 survivors at 1-2 months and again 1 and 3 years later, with an 85% reinterview rate. Examining the course of postdisaster PTSD and major depression in individuals allowed detailed consideration of remissions and delayed detection of disorders not possible from data presenting overall rates across different time frames. Only about one half of the PTSD cases identified at any time over 3 years were in remission at the 3-year follow-up. Those who did not recover from PTSD diverged from those who recovered at 3 years by reporting increased numbers of symptoms over time, especially avoidance and numbing symptoms. Although women and people with preexisting disorders were at greater risk for the development of PTSD, these variables did not predict chronicity. Chronicity of PTSD was predicted by functional impairment and seeking mental health treatment at baseline. Chronicity of major depression was predicted by report of family history of depression and treatment for paternal alcohol problems. No delayed cases of PTSD were identified. Studies are needed to compare these characteristics of the course of PTSD with other populations, using consistent methodology to allow valid comparison.

NORTH, C.S., SMITH, E.M., & SPITZNAGEL, E.L. (1994). **Posttraumatic stress disorder in survivors of a mass shooting.** *American Journal of Psychiatry, 151,* 82-88. *Objective:* PTSD has been best studied among combat veterans. Less is known about PTSD among civilian populations exposed to traumatic events. A recent mass murder spree by a gunman in a cafeteria in Killeen, Texas, has provided a unique opportunity to study acute-phase civilian responses to a combat type of experience. *Method:* Approximately 1 month after the disaster, 136 survivors were interviewed with the Diagnostic Interview Schedule/Disaster Supplement. *Results:* In the acute postdisaster period, 20% of the men and 36% of the women met criteria for PTSD, which was the most prevalent psychiatric disorder. Most subjects who developed PTSD had no history of psychiatric illness. Rates of preexisting PTSD were relatively high and did not predict the presence of PTSD after the disaster. A history of other predisaster psychiatric disorders predicted postdisaster PTSD in women but not in men. One-half of the women and one-fourth of the men with postdisaster PTSD also met criteria for another postdisaster psychiatric diagnosis, especially major depression. Psychopathology was infrequent in subjects without PTSD. *Conclusions:* Disaster intervention workers may be able to most effectively use limited mental health provider resources in the acute postdisaster period by focusing on screening for acute PTSD, which will identify the majority of cases with psychiatric disorders following this kind of disaster. Survivors who have no history of psychiatric disorder should be screened along with those who do because in the present study, they represented the majority of the PTSD cases. Subjects with a history of major depression and women with preexisting psychopathology may be especially vulnerable to posttraumatic syndromes. Individuals with PTSD should be further examined for additional psychiatric diagnoses that may complicate recovery, especially major depression. PTSD among survivors of civilian combat-like experiences does not appear to present in the same way that it has been described in Vietnam veterans.

NORTH, C.S., SMITH, E.M., & SPITZNAGEL, E.L. (1997). **One-year follow-up of survivors of a mass shooting.** *American Journal of Psychiatry, 154,* 1696-1702. *Objective:* This report describes a 1-year follow-up study of survivors of a mass shooting incident. Acute-phase data from this incident were previously reported in this journal. *Methods:* The Diagnostic Interview Schedule/Disaster Supplement was used to assess 136 survivors at 1 to 2 months and again a year later, with a 91% reinterview rate. *Results:* In the acute postdisaster period, 28% of subjects met criteria for PTSD, and 18% of subjects qualified for another active psychiatric diagnosis. At follow-up, 24% of subjects reported a history of postdisaster PTSD (17% were currently symptomatic), and 12% another current psychiatric disorder. Half (54%) of all 46 individuals identified as having had PTSD at either interview were recovered at follow-up, and no index predictors of recovery were identified. There were no cases of delayed-onset PTSD (beyond 6 months). Considerable discrepancy in identified PTSD cases was apparent between index and follow-up. Inconsistency in reporting, rather than report of true delayed onset, was responsible for all PTSD cases newly identified at 1 year. The majority of subjects with PTSD at index who were recovered at follow-up reported no history of postdisaster PTSD at follow-up, suggesting considerable influence of fading memory. *Conclusions:* This study's findings suggest that disaster research that conducts single interviews at index or a year later may overlook a significant portion of PTSD. The considerable diagnostc comorbidity found in this

study was the one robust predictor of PTSD at any time after the disaster. Disaster survivors with a psychiatric history, especially depression, may be most vulnerable to developing PTSD and therefore may deserve special attention from disaster mental health workers.

NORTH, C.S., SPITZNAGEL, E.L., & SMITH, E.M. (2001). **A prospective study of coping after exposure to a mass murder episode**. *Annals of Clinical Psychiatry, 13*, 81-87. In a study of 136 survivors of a mass murder spree, multidimensional scaling identified clusters of responses mapping from 75 coping behaviors described by victims. This powerful method identified three coping dimensions: (a) Active Outreach versus Passive Isolation, (b) Informed Pragmatism versus Abandonment of Control, and (c) Reconciliation/Acceptance versus Evading the Status Quo. These coping dimensions were used to predict change in psychiatric status prospectively assessed with structured diagnostic interviews at index 3-4 months after the event and follow-up assessments 1 and 3 years later. Statistically significant changes in the positive direction on each of the three dimensions in this study were associated with reductions of 47-79% of the odds for acute postdisaster major depression, posttraumatic stress disorder (PTSD), and any non-PTSD disorder. These findings suggest mechanisms for development of therapeutic techniques capitalizing on encouraging active outreach, informed focus and pragmatism, and reconciliation and acceptance, and reduction of passive and isolative behaviors, resignation of control, and avoidance of realities of the postdisaster situation.

PALINKAS, L.A., PRUSSING, E., REZNIK, V.M., & LANDSVERK, J.A. (2004). **The San Diego East County school shootings: A qualitative study of community level post-traumatic stress.** *Prehospital and Disaster Medicine, 19*, 113-121. *Introduction:* Within one month (March 2001), two separate incidents of school shootings occurred at two different high schools within the same school district in San Diego's East County. *Objective:* To examine community-wide expressions of post-traumatic distress resulting from the shootings that may or may not fulfill DSM-IV criteria for PTSD, but which might interfere with treatment and the prevention of youth violence. *Methods:* A qualitative study was undertaken using Rapid Assessment Procedures (RAP) in four East San Diego County communities over a six-month period following the two events. Semi-structured interviews were conducted with 85 community residents identified through a maximum variation sampling technique. Interview transcripts were analyzed by coding consensus, co-occurrence, and comparison, using QSR NVivo text analysis software. *Results:* Three community-wide patterns of response to the two events were identified: (1) 52.9% of respondents reported intrusive reminders of the trauma associated with intense media coverage and subsequent rumors, hoaxes, and threats of additional acts of school violence; (2) 44.7% reported efforts to avoid thoughts, feelings, conversations, or places (i.e., schools) associated with the events; negative assessment of media coverage; and belief that such events in general cannot be prevented; and (3) 30.6% reported anger, hyper-vigilance, and other forms of increased arousal. 23 (27.1%) respondents reported symptoms of fear, anxiety, depression, drug use, and psychosomatic symptoms in themselves or others. *Conclusions*: School shootings can precipitate symptoms of PTSD at the community level. Such symptoms hinder the treatment of individuals with PTSD and the implementation of effective prevention strategies and programs.

SCHWARZ, E.D., & KOWALSKI, J.M. (1991). **Malignant memories: PTSD in children and adults after a school shooting.** *Journal of the American Academy of Child and Adolescent Psychiatry, 30*, 936-944. Sixty-four children and 66 adults were screened for PTSD 6 to 14 months after a school shooting. Although there were no differences in overall frequencies of DSM-III-R diagnoses or cluster endorsements, there were developmental influences. PTSD was associated more with emotional states recalled from the disaster than with proximity. Emotional states mediated the formation of malignant memories leading to symptomatology, suggesting that postdisaster intervention be offered on the basis of degree of emotional reaction as well as proximity.

TRAPPLER, B., & FRIEDMAN, S. (1996). **Posttraumatic stress disorder in survivors of the Brooklyn Bridge shooting.** *American Journal of Psychiatry, 153*, 705-707. *Objective:* The authors documented the frequency of PTSD in civilian victims of urban terrorism. *Method*: A recent shooting attack on a van of Hasidic students provided a unique opportunity to document responses of survivors in this targeted group. 11 of 14 survivors were compared with age-matched subjects on a variety of questionnaires and clinical evaluations. *Results:* Of the 11 survivors, 4 were diagnosed with PTSD (all of whom also had concurrent major depressive disorder), 1 with major depressive disorder, and 2 with adjustment disorder. *Conclusions:* Findings are interpreted in the context of unique factors contributing to the heightened vulnerability of this group.

CITATIONS
Annotated by the Editor

BURGESS, G. (1998). **Integration of emergency management into day-to-day local government functions.** *Australian Journal of Emergency Management, 13(1),* 5-8.
The author discussed the various challenges faced by local government in responding to the Port Arthur shootings. Information, communication, leadership, co-ordination, and media management are vital.

CLASSEN, C., KOOPMAN, C., HALES, R., & SPIEGEL, D. (1998). **Acute stress disorder as a predictor of posttraumatic stress symptoms**. *American Journal of Psychiatry, 155*, 620-624.
The authors studied 36 persons who worked in a high-rise office building in San Francisco where 14 persons, 8 fatally, were shot. None actually saw the gunman or his victims. Twelve participants (33%) met criteria for a diagnosis of acute stress disorder (ASD). ASD was significantly related to subsequent PTSD.

CREAMER, M. (1989). **Post-traumatic stress disorder: Some diagnostic and clinical issues.** *Australian and New Zealand Journal of Psychiatry, 23*, 517-522.
The author assessed 42 persons who received treatment after the Queens Street shootings. Almost all (98%) met criteria for Criterion B, 33% for Criterion C, 86% Criterion D, and 33% met all PTSD criteria. Only those who qualified for the full diagnosis met Criterion C.

CREAMER M., BUCKINGHAM, W.J., & BURGESS, P.M. (1991). **A community based mental health response to a multiple shooting**. *Australian Psychologist, 26*, 99-102.
Describing the mental health response to the Queens Street

shooting, the authors noted the importance of community ownership. The response included a recovery center, group psychological debriefings, a workplace newsletter, and individual treatment. The centralized physical location of the building facilitated sharing of information and social support.

CREPEAU-HOBSON, M.F., FILACCIO, M., & GOTTFRIED, L. (2005). **Violence prevention after Columbine: A survey of high school mental health professionals.** *Children & Schools, 27,* 157-165.
The authors conducted a survey after the Columbine High School shootings. Most schools in Colorado made changes in security procedures, instituted crisis response plans, and increased availability of mental health services to students.

FIELDING, P. (1998). **Management of support services at Port Arthur.** *Australian Journal of Emergency Management, 13(1),* 12-15.
The author discussed the various challenges in managing support services for victims of the shootings in Port Arthur. Theses included difficulties in the immediate response, tensions over requirements that staff and visitors attend debriefing sessions, staff stress and turnover, and the convergence of fringe religious groups and independent counselors offering their services.

JENKINS, S.R. (1997). **Coping, routine activities, and recovery from acute distress among emergency medical personnel after a mass shooting incident.** *Current Psychology, 16,* 3-19.
The author studied coping and distress of 36 emergency medical personnel who responded to the Killeen shooting. Workers were assessed 8-10 days and one month post-shooting. Feeling that others understand your experience was associated with less distress, whereas self-isolation/withdrawal, spirituality, event rumination, and treatment-seeking were associated with greater distress.

LYONS, J.A. (2001b). **Partnering with clergy in school-based interventions following a rural school shooting**. *Texas Journal of Rural Health, 19(2),* 22-29.
On the basis of her experiences in responding to a shooting at a high school in Pearl, Mississippi, the author identified challenges and benefits of partnerships between clergy and mental health professionals in addressing students' and the larger community's needs.

NORTH, C.S., SMITH, E.M., MCCOOL, R.E., & SHEA, J.M. (1989). **Short-term psychopathology in eyewitnesses to mass murder.** *Hospital and Community Psychiatry, 40,* 1293-1295.
The authors interviewed 18 employees after a gunman killed two people and injured four in the business district of Russellville, Arkansas. Four cases of psychiatric disorders were identified: one with both PTSD and depression, two with depression only, and one with PTSD only. Much larger numbers reported subthreshold symptoms.

PYNOOS, R.S., NADER K., FREDERICK, C., GONDA, L., & STUBER, M. (1987). **Grief reactions in school age children following a sniper attack at school**. *Israel Journal of Psychiatry and Related Sciences, 24,* 53-63.
The severity of grief reactions increased as the students' closeness to the girl increased and as their proximity to the shooting increased. This research contributed to theories about the differences between child and adult experience of grief.

RICHARDSON, J.D., DAVIDSON, D., & MILLER, F.B. (1996). **After the shooting stops: Follow-up on victims of an assault rifle attack.** *Journal of Trauma: Injury, Infection, and Critical Care, 41,* 789-793.
In 1989, a former employee of the Standard Gravure Corporation in Louisville, Kentucky killed six and severely injured 15 others before shooting himself. Three years post-shooting, survivors acknowledged emotional disturbances, including depression, disrupted sleep, and anger. The authors concluded that emergency systems work well at saving lives but are less effective in returning patients to their pre-injury level of functioning.

SCHWARZ, E.D., & KOWALSKI, J.M. (1992). **Personality characteristics and posttraumatic stress symptoms after a school shooting.** *Journal of Nervous and Mental Disease, 180,* 735-737.
As part of a larger study, the authors assessed personality characteristics of 24 school personnel affected by the Evanston school shooting. Three personality traits (guilt and resentment, insecurity, and psychasthenia) correlated significantly and strongly with the intensity of PTSD symptoms.

SCHWARZ, E.D., KOWALSKI, J.M., & MCNALLY, R.J. (1993). **Malignant memories: Post-traumatic changes in memory of adults after a school shooting.** *Journal of Traumatic Stress,6,* 545-553.
Follow-up assessments with 12 school personnel in Evanston indicated that memories of proximity both diminished and enlarged over time, and enlargement was associated with PTSD.

WONG, M., ROSEMOND, M.E., STEIN, B.D., LANGLEY, A.K., KATAOKA, S.H., & NADEEM, E. (2007). **School-based intervention for adolescents exposed to violence.** *Prevention Researcher, 14,* 17-20.
This article provides a useful introduction to the prevalence of trauma exposure among youth. It discusses how the symptoms of PTSD may impair school performance, and describes school-based interventions aimed to treat mental health problems among adolescents exposed to violence in their schools or communities.

NCPTSD NEWS

New PILOTS Database User's Guide

The 2007 update (Fourth Edition) of the *PILOTS Database User's Guide* is now online. The *User's Guide* is divided into two sections. The first section contains useful information on creating successful searches. The second section consists of the updated PILOTS Thesaurus, a complete listing of the controlled vocabulary used both to index PILOTS articles and to create precise and productive searches. You will find the *User's Guide* at http://www.ncptsd.va.gov/ncmain/publications/pilots/dbguide.html

PILOTS UPDATE

This issue of the *PTSD Research Quarterly* explores the literature on the impact of mass shootings. Within each of its principal themes, the article is organized by event, reflecting the substantial number of publications that examine the consequences of individual traumatic incidents. To make it easy for researchers to identify such publications, the PILOTS Database assigns each incident a uniform identifier, which is included in the publication's Descriptor field along with the appropriate descriptor(s) from the PILOTS Thesaurus. Thus an article on the catastrophic storm that hit New Orleans in 2005 will receive both the descriptor "Hurricanes" and the identifier "Hurricane Katrina (2005)."

There are two differences between descriptors and identifiers. First, each descriptor exists in a hierarchical relationship to the other descriptors in the PILOTS Thesaurus, as shown in the "Systematic Table of PILOTS Database Descriptors" on pages 22-32 of the new PILOTS Database User's Guide. Identifiers are not included in the PILOTS Thesaurus, but appear on the three Term Lists on pages 173-177 at the back of the User's Guide. Second, descriptors are rarely added to the Thesaurus except when a new edition of the User's Guide is published. Identifiers are introduced whenever the need arises.

In addition to identifiers for specific traumatic incidents, we also assign identifiers to specific persons and organizations. As these also are assigned as the need arises — that is, when we begin to index publications dealing with a particular incident, person, or organization — one should not infer from the presence or absence of any term that we are expressing an opinion of its nature or its importance. The Term Lists are simply a reflection of the names that occur in the literature that comes before us. As always, we welcome information on literature that we have missed.

Sometimes the name that we adopt for indexing purposes is one of several synonyms for the same incident, person, or organization. Though at present the Term Lists published in the PILOTS Database User's Guide do not contain cross-references, we hope to add these in future editions. For the time being, users who do not find an expected name should search through the relevant list to find the version that we have adopted. (Although we try to choose names that are self-explanatory, sometimes the literature will subsequently take an unexpected direction: thus what we call the "Kobe Earthquake (1995)" has increasingly been called the Hanshin-Awaji Earthquake by Japanese researchers, who have contributed the bulk of the literature on it.)

A convenient way to find identifiers and use them in searching the database is to use the Descriptors Index provided by the CSA Illumina interface to the PILOTS Database. From the opening screen, click the "Search Tools" tab. Then click on the "Indexes" tab, use the pull-down "Select an Index" menu to choose the "Descriptors Index," and in the box below enter the first word of the term you are looking for. You can then use the check boxes to select the term(s) of interest to you, and click on the "Search" button to perform your search.

The PILOTS Thesaurus has always accorded special treatment to one type of traumatic incident: we have assigned descriptors rather than identifiers to armed conflicts. A list of wars to which we have assigned specific descriptors appears on page 95 of the new PILOTS Database Users Guide. As with any such list, it is problematic: often the involved parties disagree as much about the proper name for a conflict as they did about the issues that caused it. (Consider the American Civil War, which many Southerners were taught to call the War Between the States. Its official name, which no one has used for a century, is the War of the Rebellion.) The names that the PILOTS Database uses for wars in which the United States has taken part reflect an American perspective. The names we use for other wars reflect the terminology most often used in the publications that we have encountered in our bibliographic work. Sometimes it is difficult to establish a suitable nomenclature, as in places such as Iraq and Afghanistan which have seen a succession of conflicts between various state and non-state parties. We are exploring solutions to this problem, and we welcome suggestions from PILOTS Database users.