

60,000 Disaster Victims Speak: Part II. Summary and Implications of the Disaster Mental Health Research

FRAN H. NORRIS, MATTHEW J. FRIEDMAN, AND PATRICIA J. WATSON

On the basis of the literature reviewed in Part I of this two-part series (Norris, Friedman, Watson, Byrne, Diaz, and Kaniasty, this volume), the authors recommend early intervention following disasters, especially when the disaster is associated with extreme and widespread damage to property, ongoing financial problems for the stricken community, violence that resulted from human intent, and a high prevalence of trauma in the form of injuries, threat to life, and loss of life. Meeting the mental health needs of children, women, and survivors in developing countries is particularly critical. The family context is central to understanding and meeting those needs. Because of the complexity of disasters and responses to them, inter-agency cooperation and coordination are extremely important elements of the mental health response. Altogether, the research demands that we think ecologically and design and test societal- and community-level interventions for the population at large and conserve scarce clinical resources for those most in need.

A substantial amount of research pertinent to understanding the effects of disasters has been published over the past 20 years. Part I of this review described results for 160 distinct samples composed of over 60,000 individuals who experienced 102 different events (Norris, Friedman, Watson, Byrne, Diaz, and Kaniasty this volume). These samples' experiences and outcomes were studied

using a variety of designs, time frames, assessment strategies, and sampling methods. Although American adults were overrepresented in the data, the samples were impressively diverse, including children, adolescents, college students, and older adults as well as middle-aged adults, from 29 countries or territories and five continents. Living in a variety of resource contexts, these survivors experienced almost every imaginable type of disaster, including floods, hurricanes, earthquakes, wildfires, nuclear and industrial accidents, an array of transportation accidents on the ground, in the air, and at sea, terrifying sniper attacks, and bombings that caused unthinkable destruction and death. Individuals' experiences ranged from little more than inconvenience to life-threatening danger, severe injuries, multiple bereavements, and the total destruction of their communities. Accordingly, it is not surprising that psychological outcomes varied across samples from a predominance of transient stress reactions to prevalent and persistent psychopathology. In this companion article, we aim to summarize and interpret the empirical results and to draw implications

Fran H. Norris, PhD, is Professor of Psychology at Georgia State University, Atlanta. *Matthew J. Friedman, MD, PhD*, is Executive Director of the National Center for Posttraumatic Stress Disorder (NCPTSD) and Professor of Psychiatry at Dartmouth Medical School. *Patricia J. Watson, PhD*, is Deputy Director of Education at the NCPTSD.

This work was funded by an interagency collaborative agreement between the Center for Mental Health Services and the Department of Veterans Affairs National Center for Posttraumatic Stress Disorder. Preparation of the manuscript was also funded by support from Grant K02 MH63909, awarded to Fran H. Norris.

Address correspondence to Fran H. Norris, National Center for PTSD, VA Medical Center, 215 North Main Street, White River Junction, VT 05009 or fnorris@gsu.edu.

from them for practice in disaster mental health. We begin by describing results for disasters generally and then consider the implications of sample- and individual-level variations in outcomes. We close by providing a few general comments on the state of the art in disaster mental health practice and research.

OVERALL RANGE, MAGNITUDE, AND DURATION OF EFFECTS

Summary of Results

Six sets of outcomes were observed in these studies. Specific psychological problems, such as anxiety and depression and most notably posttraumatic stress disorder (PTSD), were found most often, followed by nonspecific psychological distress and varying health problems and concerns. Problems in living and psychosocial resource loss were also identified as ongoing sources and manifestations of stress. Youth exhibited additional problems unique to their age groups, such as behavioral problems, hyperactivity, and delinquency, but like adults, they were also vulnerable to PTSD, depression, somatic complaints, and ongoing stress. In interpreting these results, it should be kept in mind that the relative frequencies of these outcomes are a function of how frequently they were assessed as well as how frequently they were observed if assessed.

To provide a rough measure of the overall severity of these effects, we classified each of the 160 samples' results on a 4-point scale. Relatively few samples (11%) showed only minimal or highly transient impairment, whereas approximately half of the samples (51%) showed moderate impairment, indicative of prolonged stress. The remainder showed severe (21%) or very severe (18%) impairment, indicative of clinically significant distress (determined on the basis of percentages scoring above established cutpoints on standardized scales) or criterion-level psychological disorder (determined on the basis of diagnostic instruments).

Moreover, the review showed that the effects of disasters may be quite enduring. Duration cannot be totally divorced from magni-

tude, as stronger effects are also more likely to persist. In general, the first year was the time of peak symptoms and effects, and people did improve over time. Yet in many studies symptoms lingered for months, even years, for a significant minority of participants. The research also suggests that we may be able to identify the persons who are most at risk for long-term distress fairly early in the process. Delayed onset of symptoms was rare.

General Implications for Practice

The most fundamental conclusion to be drawn from these findings is that disasters do have implications for mental health for a significant proportion of persons who experience them. These effects are multifaceted and frequent; they begin early and often last a long time. Why do many disasters have such pervasive and lasting consequences for mental health? The reasons span biological, psychological, and social domains. Not all disasters are traumatic, but many do create the "helplessness in the face of intolerable danger, anxiety, and instinctual arousal" that is the essence of psychic trauma (Eth and Pynoos 1985, p. 38). As Janoff-Bulman (1985) noted, such dramatic events force us to "recognize, objectify, and examine" our most basic cognitions about the world (p. 18). Information processing models (Horowitz 1976) emphasize survivors' need to process the event until it can be assimilated, setting in motion the alternating cycles of intrusion and avoidance that are the hallmark of posttraumatic stress. Moreover, following many disasters, the loss of important attachments is almost unavoidable, and social and community resources deteriorate just when victims need them the most (Kaniasty and Norris 1993). These are not competing explanations but are complementary—perhaps even synergistic—causal mechanisms underlying the adverse effects of disasters.

That individuals who are most at risk for long-term effects can be identified very early in the aftermath of disasters points to a need for screenings and early interventions in disaster mental health. Screening for acute symptoms of distress must be undertaken with caution and sensitivity. The value of early

screenings ultimately rests on the ability to use such data to provide better care. The management of acute stress reactions following disasters includes many components that generally aim to foster resiliency, prevent chronic emotional problems, and minimize long-term deterioration in quality of life. At this time, however, evidence is limited that early intervention following disasters can help prevent longer-term problems and is not adequate either to endorse or to reject any specific approach.

The majority of intervention studies following disaster have addressed the effects of psychological debriefing. Psychological debriefing is received well by many participants, but the majority of methodologically strong studies show that it does not prevent PTSD or other psychopathology (Rose, Brewin, Andrews, and Kirk 1999) and may even worsen psychological symptoms (Mayou, Ehlers, and Hobbs 2000). Recent reviews (Litz, Gray, Bryant, and Adler 2002; Rose, Bisson, and Wessely 2001) conclude that psychological debriefing should not be practiced routinely in the immediate aftermath of exposure to trauma.

For individuals who require more intense clinical intervention following disasters, cognitive-behavioral treatments (CBT) have received the strongest empirical support. While there is no published research on the effectiveness of early CBT following disasters, there are a number of studies in which 4–5 sessions administered to acutely traumatized individuals resulted in clinical improvement in PTSD symptoms, even at long-term follow-up (Bryant, Harvey, Dang, Sackville, and Basten 1998; Bryant, Sackville, Dang, Moulds, and Guthrie 1999; Echebura, de Corral, Sarasua, and Zubizarreta 1996; Foa, Hearst-Ikeda, and Perry 1995). Some elements of cognitive-behavioral interventions may not be appropriate for those experiencing extreme anxiety, suicide risk, marked ongoing stressors, or acute bereavement (Bryant and Harvey 2000). In such cases, other techniques such as anxiety management, supportive therapy, or pharmacological intervention may be preferable. Although there have been very few studies exam-

ining medications for the treatment of acute stress symptoms, Shalev and Ursano (in press) stated that there are both theoretical and experiential reasons to predict that judicious use of certain medications may make a significant difference in the management of acute traumatic stress reactions.

The need for controlled research in this area is critical. Research investigating early intervention following trauma is developing rapidly, however, and it is expected that a variety of controlled outcome studies with a range of trauma populations and delivery environments will be produced within the foreseeable future.

Although much of the preceding discussion has focused on PTSD and acute stress disorder, the breadth of the outcomes observed clearly indicates that we should not focus too narrowly on any one condition in either research or practice. Depression, physical health problems, interpersonal problems, and deteriorating social resources require attention as well. Individual disaster victims need access to a range of medical, psychological, and social services. On the basis of these results, we would advocate for a more comprehensive system of care—one that integrates primary and psychiatric care and one that addresses community and family, as well as individual, needs. We return to these points momentarily.

SAMPLE-LEVEL PREDICTORS OF VARIATIONS IN IMPAIRMENT

Effects of Sample Type

In our empirical review, we compared results across three sample types: schoolage youth, adult survivors, and rescue/recovery workers. Table 1 shows the sample- or event-level characteristics that appear to be most strongly related to the community's or population's need for mental health assistance. Relative to the risk of adult survivors, risk of severe impairment increased if the sample was composed of youth. It was previously stated that

TABLE 1
Sample- and Event-Level Risk Factors for Postdisaster Mental Health Problems

Variable	Group most at risk	Compared to
Sample type	Schoolage youth Adult survivors	Adults Responders
Disaster location	Survivors in developing countries Survivors in other developed countries	Survivors in developed countries Survivors in the United States
Disaster type	Survivors of mass violence Survivors of technological disasters in developed countries	Survivors of natural or technological disasters Survivors of natural disasters in developed countries

the effects of disasters stem from the cumulative or synergistic effects of acute helplessness, instinctual arousal, inability to comprehend and make sense of the world, loss of perceived safety, and loss of important attachments and perceived social support. To this extent this view of the phenomenon is accurate, it follows quite logically that, on average, youth would be less well equipped to cope with disasters than are adults.

Children and adolescents can be helped in a number of ways. In a recent review of prevention and intervention approaches for children exposed to disasters, La Greca (2001) identified only three controlled studies of child treatment following disasters, which clearly points to a critical need for more and better research. On the basis of the available evidence, La Greca concluded that "gradual exposure to traumatic events, with opportunity to reprocess the event in a reparative manner, is a critical component of treating youth with severe levels of PTSD following disaster" (p. 213). The professional must understand what the event means to the child and why the child believes it occurred. La Greca furthermore noted that grief management and anger management are often appropriate, depending upon the nature of the event. Less seriously distressed children may be assisted by means of a school consultation model and manual (La Greca, Vernberg, Silverman, and Prinstein 1994) that aims to help teachers and counselors to increase childrens' social support and promote positive coping. As with adults, efforts to normalize psychological reactions to disaster are assumed to be very

important in school-based interventions. Nonetheless, making parents aware of their children's distress, when severe, is a helpful component of school-based need assessments and screenings. Recent research (Pfefferbaum et al. 2001) indicates that it may be helpful to limit children's exposure to media and other graphic depictions of destruction and death.

Relative to the risk of adult survivors, risk of severe impairment decreased if the sample was composed of rescue or recovery workers. In light of recent events in the United States, specifically the September 11 terrorist attack on the World Trade Center and the Pentagon, the effect for recovery workers should be interpreted with caution. While often exposed to horror, these rescue and recovery workers seldom experienced direct losses or extensive bereavement. The heterogeneity of the responder samples was problematic, and as research on this topic grows, it would be advisable to make finer distinctions between responder groups exposed to physical danger (e.g., firefighters), horror and the dead (e.g., body handlers, medical personnel), and vicarious trauma (e.g., counselors). Moreover, our review was restricted to the consequences of single, dramatic events and does not necessarily apply to the consequences of chronic exposure to trauma experienced by occupational groups who respond to survivors and victims of war, sexual assault, or family violence.

These various caveats notwithstanding, it is also possible that we could learn much about the factors that foster resilience in these groups that seem to fare better than objective circumstances suggest they should (Alexander

and Wells 1991). Maturity and experience may buffer the stress of disasters (McCarroll et al. 1996; Norris and Murrell 1988). As Ursano, McCaughey, and Fullerton (1994) noted, construction of meaning is an active process that appears to affect the outcome of a traumatic experience. It is possible that we could learn from the capacity of such workers to support one another and to develop a meaningful narrative about their experience.

Effects of Disaster Location

We likewise compared results across three disaster locations: the United States (and its territories), other developed countries, and developing countries. Relative to the risk of American survivors, risk of impairment increased if the sample was composed of individuals from other developed countries and especially if it was composed of individuals from developing countries. This finding may indicate that, outside of the United States, only the most severe events tend to be studied or it may reflect the fact that disasters tend to be more severe when they occur in the developing world. Many of the samples from developing countries survived disasters where death tolls were measured in thousands or even tens of thousands, such as the horrendous Armenian earthquake, the Mexico City earthquake, the Armero volcano eruption, and Hurricane Mitch. If this effect reflects the importance of surviving in a context of massive destruction and death, rather than location per se, it may have relevance for the United States as it now grapples with the aftermath of a disaster of comparable enormity. The difference may also attest to the ability of government services and other resources to make a difference in the lives of disaster victims.

As we noted earlier, we need to provide disaster victims with better-integrated systems of primary and psychiatric care and to foster community-based as well as clinical interventions in disaster-stricken communities. If these needs exist in developed countries, they are profound in developing countries where mental health infrastructures and professionals are often lacking. Guided by the “inverted tri-

angle model” of psychosocial intervention, which is reproduced with permission in Figure 1 (Green et al. in press), the Disaster Committee (Somasundaram, Norris, Asukai, and Murthy, in press) of the United Nations—International Society for Traumatic Stress Studies Joint Initiative on Trauma presented numerous recommendations for community, family, and individual interventions that would be appropriate in the context of most developing countries. No one set of recommendations will apply to all communities cross-culturally. It is important that the activities match the cultural context and needs of the group. The best way to assure this is to involve the community in evaluating its own needs and determining which actions are most suitable.

Effects of Disaster Type

As for the influence of disaster type, we compared results across samples experiencing natural disasters, technological disasters, and mass violence. The findings regarding the consequences of experiencing disasters caused by malicious human intent were unequivocal. Samples who experienced mass violence were far more likely than other samples to be severely or very severely impaired. From either an information processing or resource loss perspective, disasters of mass violence may be especially difficult for victims to comprehend or assimilate, making intrusion and avoidance symptoms more likely. Because shooting sprees and terrorist attacks tend to be indiscriminate and random (Stern 1999), they create acute helplessness and anxiety and may be even more likely than other disasters to shatter beliefs of the self as invulnerable and of the world as a meaningful and just place (Janoff-Bulman 1985).

Despite evidence to the contrary (Rubonis and Bickman 1991), it has become widely accepted in the field of disaster research that technological disasters have more adverse consequences than natural disasters because they symbolize human callousness and carelessness. It is time to reexamine our ideas about this. The literature in the field has

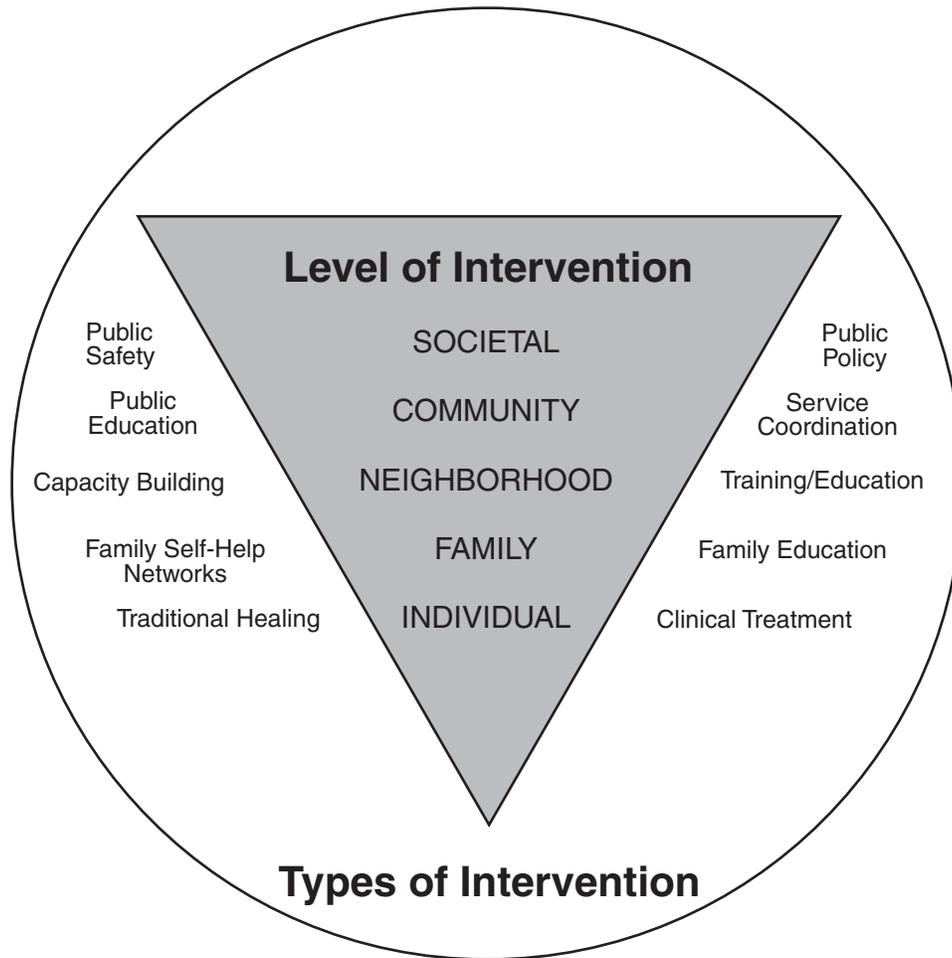


Figure 1. Inverted triangle model of intervention related to humanitarian crises. Reprinted by permission from Green et al., in press.

changed markedly in the past decade. First, Hurricane Andrew was followed by an extraordinary amount of research, and many of these studies found quite severe effects. Second, international research has mushroomed and many of these studies have examined devastating natural disasters. In our analysis, natural disasters in developing countries yielded a higher mean aggregate severity rating than did either type of disaster in developed countries. Many of our ideas about the course of recovery from natural disasters are based very much on Western experience, where predisaster housing quality, controls over land use, and warning systems are far superior to the

norms in developing countries. The destruction caused by natural disasters nearly always has—or is perceived to have—a human element.

What Types of Interventions Are Required for What Types of Events?

It should also be recognized that disasters of a given type varied considerably in their effects. It would be a mistake to focus solely on the cause of the disaster when considering implications of the research for clinical and community interventions. Overall, from the illustrative studies (Norris et al., this volume)

and others similar to them in the database, we conclude that (1) when injuries and deaths are rare, (2) when the destruction or loss of property is confined relative to the size and resources of the surrounding community, (3) when social support systems remain intact and function well, and (4) when the event does not take on more symbolic meanings of neglect or maliciousness, disasters should have minimal consequences for mental health at the population level beyond those associated with transient stress reactions. Such events may compose a minority of those in the published literature, but probably a larger share of real life events in the United States. Such events probably do not require large-scale professional interventions, although crisis intervention strategies that ameliorate the initial stress may be helpful. At a moderate level of impact, ongoing programs that can reduce stress, enhance social support, and provide reassurance about future risk are advisable at the community level. Such programs might encompass mechanisms for identifying and referring the minority of those with more serious impairment for professional treatment.

Disasters that engender severe, lasting, and pervasive psychological effects are rare, but they do happen. On occasion, even natural disasters may be of sufficient magnitude to produce severe and chronic impairment in a substantial portion of the population. Altogether, it appeared that sample- (and presumably population) level effects were greatest when at least two of the following event-level factors were present: (1) The disaster caused extreme and widespread damage to property, (2) the disaster engendered serious and ongoing financial problems for the community, (3) the disaster was caused by human intent, and (4) the impact was associated with a high prevalence of trauma in the form of injuries, threat to life, and loss of life. When such disasters occur, it appears that the need for professional level mental health services will be widespread. Delivering mental health services after such disasters will pose a tremendous challenge but seems to be required. Even in these cases, it is expected that the majority of survivors will not exhibit clinically significant

symptomatology or disability. Thus the inverted triangle (Figure 1), which demands that we think ecologically and design societal and community-level interventions for the population at large and conserve scarce clinical resources for those most in need, is a useful image because it reminds us to think ecologically when designing systems of care.

INDIVIDUAL-LEVEL PREDICTORS OF VARIATIONS IN IMPAIRMENT

Risk Factors for Adverse Outcomes

It is well established that individuals vary markedly in their outcomes even when they have experienced the same event. A variety of factors have been found to influence the likelihood that an individual within a community will develop serious or lasting psychological problems in the wake of disasters. Gender, age, prior experience, ethnicity, culture, socioeconomic status (SES), family structure, problems of children, parents, or spouses, severity of exposure, secondary stressors, pre-disaster psychiatric history and personality, and a variety of psychosocial resources all appear to play a role. Undoubtedly these factors work together in ways more complex than captured in the research to date and, in fact, interactive effects of these risk factors often emerged when such effects were tested. The effects of gender were modified by culture, those of marital status by gender, those of severity of exposure by SES, and those of personal loss by community destruction. Other times, the effects of certain variables were mediated by other variables; for example, acute stressors increase the likelihood of chronic stressors, which in turn increase the likelihood of psychological distress. Furthermore, some of these effects may be confounded with others; for example, findings that middle-aged adults, parents, and married women are disproportionately distressed all may be capturing the same processes: that caring for others is a source of stress (as well as a source of comfort) in the aftermath of disasters. The state of the art is such that we cannot provide a fully inte-

grated understanding of how all of these factors work together to increase risk. Thus, despite some synergism, we now must think of them as additive and propose that an individual's risk will increase along with the number of risk factors present and decrease along with the number of protective factors present (see Table 2). Models of care, support, and resource provision are needed that allow us to reach out to at-risk adults, such as mothers of young children and persons who are socially isolated or poor. Groups at very low risk, such as older adults, childless men, and high-resource individuals should assume a greater share of the burden for the community's recovery through appropriate volunteer and paraprofessional activities.

With a few modifications, this risk-factor model holds reasonably well for children and adolescents, but the supporting data are fewer and less consistent. Also, the influence of family system variables may be so strong for children that they overpower the influence of other variables. As discussed previously, children attract much-needed attention after disasters, especially through school

systems. While such efforts are laudable, interventions designed for them may be of limited effectiveness if the family is not considered as a whole. In fact, providing care and support to their parents might be among the most effective ways to provide care and support to children affected by disasters.

Resource Dynamics

Psychosocial resources play a central role in protecting disaster victims' mental health. They undoubtedly account for the overall resilience many, if not most, people show in the face of even quite serious stress. Unfortunately, these same resources are vulnerable to the impact of disasters unless survivors successfully mobilize and sustain those resources that serve to protect and replenish the vulnerable ones. From a resource perspective, the primary goal of postdisaster interventions is to help people replace valued resources as quickly as possible (Hobfoll and Lilly 1993). The longer a loss cycle is allowed to generate momentum, the greater are the resources required to halt that cycle. As resources become

TABLE 2
Individual-Level Risk Factors for Poor Mental Health Outcomes

Category	Risk factor
Trauma and stress	Severe exposure to the disaster, especially injury, threat to life, and extreme loss. Living in the context of a neighborhood or community that is highly disrupted or traumatized. High secondary stress, regardless of whether it is of an acute or chronic nature.
Survivor characteristics	Female gender. If an adult survivor, age in the middle years of 40–60. Little previous experience relevant to coping with the disaster. Membership in an ethnic minority group. Poverty or low socioeconomic status. Predisaster psychiatric history.
Family context	If an adult survivor, the presence of children in the home and, if female, the presence of a spouse. If child survivor, the presence of parental distress. The presence of a family member who is significantly distressed. Interpersonal conflict or lack of supportive atmosphere in the home.
Resource context	Lacking or losing beliefs in one's ability to cope and control outcomes. Possessing few, weak, or deteriorating social resources.

more depleted, there are too few remaining resources to invest toward their replacement, making positive responses to interventions exceedingly difficult to achieve. There will be times when psychiatrists and other mental health workers might assist victims to develop specifically relevant skills, but it may be most important for these workers simply to reassure survivors that they do, in fact, have what it takes to overcome even this disaster. Service providers must involve the local population in an active and decision-making role rather than in a dependent, victim role. Overall, interventions should emphasize empowerment, meaning they draw upon and build strengths, capabilities, and self-sufficiency.

Naturally occurring social resources are vital for disaster victims. How to enhance social support following a given disaster will vary depending upon the nature of the disaster, setting, and culture, but a few general recommendations can be made on the basis of these results. To prevent loss of social resources, it would be most helpful to keep people in their natural groups if they must be relocated. Returning to normal activities as soon as possible may be important because these activities keep people informed about the relative needs of network members and provide the best forums for the sharing of experiences and feelings that is believed to be so important for disaster victims. One of the basic tenets of crisis counseling is that people need to recognize that some distress is a normal reaction to an abnormal event. What better way to recognize this than through the social comparisons provided by routine social interactions? More importantly, such activities may serve to preserve a sense of continuity, social embeddedness, and quality of community life. It also might be helpful to educate the public about the reasons significant others may not always be able to provide them with the quality or quantity of interpersonal support they expect. Finally, professionals and outsiders should be careful not to undermine natural helping networks. Providing indigenous networks with the resources they need to help one another is (or should be) the primary objective of disaster mental health policy.

CONCLUDING REMARKS

The Need for Effective and Coordinated Mental Health Care

Disasters are enormously complex events. They affect large numbers of people simultaneously and require public health responses encompassing multiple levels of intervention (societal, community, neighborhood, family, individual) and varying degrees of intensity (psychoeducation for many, treatment for a few). The effects of disasters are diverse and require responses that address a myriad of outcomes, including psychiatric disorders, generalized distress, physical illness, and various interpersonal problems. The aftermath is a motion picture, the effects a moving target—meaning that they unfold in ways that we are not yet able to anticipate precisely, despite some commonalities across events (Somasundaram et al. in press). Different subgroups of the population are more and less likely to be affected and require responses that are tailored to their unique combinations of risk and protective factors.

Given this multidimensional complexity, it perhaps should not be surprising that systems issues reign supreme as barriers to providing disaster victims with effective mental health services. Notwithstanding the critical importance of developing evidenced-based methods of clinical treatment, such approaches will have limited utility if they are embedded in a chaotic system of care. Following major disasters, various federal or national agencies, state or regional offices of public and mental health, substance use prevention and treatment programs, victims services, school systems, universities, media, and various community-based and nongovernmental organizations may all be seeking to play a role in the recovery effort. Issues of coordination and cooperation are very real and are mentioned over and over again by professionals who have found themselves in the position of responding to major events in their communities (Bowencamp 2000; Call and Pfefferbaum 1999; Canterbury and Yule in press; Gillespie and Murty 1994; Hodgkinson and Stewart

1998). There is little, if any, research that addresses these critical issues, and thus there is still much to be learned about how systems-level factors (e.g., coherence, supportiveness) shape providers' abilities to deliver effective services to consumers.

Issues in Research

We will close by commenting on disaster research more generally. Disaster research is different from most other fields in that much of the work is motivated by a sense of urgency and concern. Disaster research has both benefited and suffered from this. It has benefited because the cadre of researchers is fluid, and new ideas are accepted and welcomed. It has benefited also because the result has been an impressively diverse database that includes samples from all different regions of the United States, as well as from 28 other countries or territories (and this describes only the research that has been published in English). However, disaster research has also suffered from this situation. Scholarship is not always the best because studies often are undertaken under conditions where there simply is not time to absorb a literature that is scattered across a variety of journals and is mixed in quality. Concerns about experimental designs and scientific rigor must often take a back seat to provider beliefs, consumer demands, and clinical necessities. Most of the research is atheoretical and little of it is programmatic. On the basis of this review, we will state our opinion unequivocally that we do not need more research that establishes *only* that se-

verely exposed disaster victims develop psychological disorders or, worse, that barely exposed disaster victims do not. We need carefully conceived and theory-driven studies of basic process that are longitudinal in design. Prospective designs are highly valued, but prospective studies will confuse more than clarify if the participants were not exposed to a degree where adverse consequences should even be expected. We need more research that addresses the needs of diverse populations. We need more complex studies of family systems and community-level processes. We need to identify and investigate novel approaches to community intervention, where the intervention itself has been designed to produce collective rather than individual improvements. Even more importantly, we need investigators that test their ideas about risk and protective factors via action research and interventions. We need to learn at an operational level how to foster resilience and reduce vulnerability in both specific target populations and in the population at large. We need more collaboration between researchers and practitioners.

We hope that this review has provided future disaster researchers with a comprehensive and organized summary of the state of the art. By having better access to what is known, investigators can focus more readily on filling gaps in this knowledge base. We hope that new researchers will bring insights from other areas that add to our understanding of the processes through which individuals and communities recover from events that, in a perfect world, no one would ever have to experience.

REFERENCES

- ALEXANDER, D. Stress among police body handlers: A long-term follow-up. *British Journal of Psychiatry* (1993) 163:806–8.
- ALEXANDER, D., and WELLS, A. Reactions of police officers to body-handling after a major disaster: A before and after comparison. *British Journal of Psychiatry* (1991) 159:547–55.
- ANDERSON, K., and MANUEL, G. Gender differences in reported stress response to the Loma Prieta earthquake. *Sex Roles* (1994) 30:725–33.
- ARATA, C., PICO, J., JOHNSON, G., and MCNALLY, T. Coping with technological disaster: An application of the conservation of resources model to Exxon Valdez oil spill. *Journal of Traumatic Stress* (2000) 13:23–39.
- ARMENIAN, H., MORIKAWA, M., MELKONIAN, A., HOVANESIAN, A., HAROUTUNIAN, N., SAIGH, P. et al. Loss as a determinant of PTSD in a cohort of adult survivors of the 1988 earthquake in Armenia: Implications for policy. *Acta Psychiatrica Scandinavica* (2000) 102:58–64.
- ASARNOW, J., GLYNN, S., PYNOOS, R., NA-

- HUM, J., GUTHRIE, D., CANTWELL, D., et al. When the earth stops shaking: Earthquake sequelae among children diagnosed for pre-earthquake psychopathology. *Journal of the American Academy of Child and Adolescent Psychiatry* (1999) 38:1016–23.
- BARTONE, P., URSANO, R., WRIGHT, K., and INGRAHAM, L. The impact of a military air disaster on the health of assistance workers: A prospective study. *Journal of Nervous and Mental Disease* (1989) 177:317–28.
- BAUM, A., GATCHEL, R., and SCHAEFFER, M. Emotional, behavioral and physiological effects of chronic stress at Three Mile Island. *Journal of Consulting and Clinical Psychology* (1983) 51:565–72.
- BENIGHT, C., IRONSON, G., KLEBE, K., CARVER, C., WYNINGS, C., BURNETT, K., et al. Conservation of resources and coping self-efficacy predicting distress following a natural disaster: A causal model analysis where the environment meets the mind. *Anxiety, Stress, and Coping* (1999) 12: 107–26.
- BENIGHT, C., SWIFT, E., SANGER, J., SMITH, A., and ZEPPELIN, D. Coping self-efficacy as a mediator of distress following a natural disaster. *Journal of Applied Social Psychology* (1999) 29: 2443–64.
- BLAND, S., O'LEARY, E., FARINARO, E., JOSSA, F., and TREVISAN, M. Long-term psychological effects of natural disasters. *Psychosomatic Medicine* (1996) 58:18–24.
- BLAND, S., O'LEARY, E., FARINARO, E., JOSSA, F., KROGH, V., VIOLANTI, J., et al. Social network disturbances and psychological distress following earthquake evacuation. *Journal of Nervous and Mental Disease* (1997) 185:188–94.
- BOLIN, R. *Long-term Family Recovery from Disaster*. Institute of Behavioral Science, University of Colorado, 1982.
- BOLIN, R., and KLENOW, D. Response of the elderly to disaster: An age-stratified analysis. *International Journal of Aging and Human Development* (1982–1983) 16:283–96.
- BOLIN, R., and KLENOW, D. Older people in disaster: A comparison of black and white victims. *International Journal of Aging and Human Development* (1988) 26:29–43.
- BOLTON, D., O'RYAN, D., UDWIN, O., BOYLE, S., and YULE, W. The long-term psychological effects of a disaster experienced in adolescence: II. General psychopathology. *Journal of Child Psychology and Psychiatry and Allied Disciplines* (2000) 41:513–23.
- BOWLER, R., MERGLER, D., HUEL, G., and CONE, J. Psychological, psychosocial and psychophysiological sequelae in a community affected by a railroad chemical disaster. *Journal of Traumatic Stress* (1994) 7: 601–24.
- BRADBURN, I. After the earth shook: Children's stress symptoms 6–8 months after a disaster. *Advances in Behaviour Research and Therapy* (1991) 13:173–9.
- BRAVO, M., RUBIO-STIPEC, M., CANINO, G., WOODBURY, M., and RIBERA, J. The psychological sequelae of disaster stress prospectively and retrospectively evaluated. *American Journal of Community Psychology* (1990) 18:661–80.
- BRIERE, J., and ELLIOTT, D. Prevalence, characteristics, and long-term sequelae of natural disaster exposure in the general population. *Journal of Traumatic Stress* (2000) 13:661–79.
- BROMET, E., PARKINSON, D., and DUNN, L. Long-term mental health consequences of the accident at Three Mile Island. *International Journal of Mental Health* (1990) 19:48–60.
- BROMET, E., PARKINSON, D., SCHULBERG, H., and GONDEK, P. Mental health of residents near the Three Mile Island reactor: A comparative study of selected groups. *Journal of Preventive Psychiatry* (1982) 1:225–76.
- BROMET, E., GOLDGABER, D., CARLSON, G., PANINA, N., GOLOVAKHA, E., GLUZMANN, S., et al. Children's well-being 11 years after the Chernobyl catastrophe. *Archives of General Psychiatry* (2000) 57:563–71.
- BROOKS, N., and MCKINLAY, W. Mental health consequences of the Lockerbie disaster. *Journal of Traumatic Stress* (1992) 5:527–43.
- BRYANT, R. A., and HARVEY, A. G. *Acute Stress Disorder: A Handbook of Theory, Assessment, and Treatment*. American Psychological Association, 2000.
- BRYANT, R. A., SACKVILLE, T., DANG, S. T., MOULDS, M., and GUTHRIE, R. Treating acute stress disorder: An evaluation of cognitive behavior therapy and supportive counseling techniques. *American Journal of Psychiatry* (1999) 156: 1780–6.
- BRYANT, R. A., HARVEY, A. G., DANG, S. T., SACKVILLE, T., and BASTEN, C. Treatment of acute stress disorder: A comparison of cognitive-behavioral therapy and supportive counseling. *Journal of Consulting and Clinical Psychology* (1998) 66:862–6.
- BURGER, J., and PALMER, M. Changes in and generalization of unrealistic optimism following experiences with stressful events: Reactions to the 1989 California earthquake. *Personality and Social Psychology Bulletin* (1992) 18:39–43.
- BURGER, L., VAN STADEN, F., and NIEUWOUDT, J. The Free State floods: A case study. *South African Journal of Psychology* (1989) 19:205–9.
- BURNETT, K., IRONSON, G., BENIGHT, C., WYNINGS, C., GREENWOOD, D., CARVER, C., CRUESS, D., BAUM, A., and SCHNEIDERMAN, N. Measurement of perceived disruption during rebuilding following Hurricane Andrew. *Journal of Traumatic Stress* (1997) 10:673–81.
- CALDERA, T., PALMA, L., PENAYO, U., and KULLGREN, G. Psychological impact of the Hurri-

- cane Mitch in Nicaragua in a one-year perspective. *Social Psychiatry and Psychiatric Epidemiology* (2001) 36:108–14.
- CALL, J., and PFEFFERBAUM, B. Lessons from the first two years of Project Heartland, Oklahoma's mental health response to the 1995 bombing. *Psychiatric Services* (1999). 50:953–5.
- CANINO, G., BRAVO, M., RUBIO-STIPEC, M., and WOODBURY, M. The impact of disaster on mental health: Prospective and retrospective analyses. *International Journal of Mental Health* (1990) 19:51–69.
- CANTERBURY, R., and YULE, W. Planning a psychosocial response to a disaster. In W. Yule ed., *Posttraumatic stress disorders: Concepts and therapy*. John Wiley & Sons, in press.
- CARLIER, I., and GERSONS, B. Stress reactions in disaster victims following the Bijlmermeer plane crash. *Journal of Traumatic Stress* (1997) 10: 329–35.
- CARR, V., LEWIN, T., WEBSTER, R., HAZELL, P., KENARDY, J., and CARTER, G. Psychological sequelae of the 1989 Newcastle earthquake: I. Community disaster experiences and psychological morbidity 6 months post-disaster. *Psychological Medicine* (1995) 25:539–55.
- CARR, V., LEWIN, T., KENARDY, J., WEBSTER, R., HAZELL, P., CARTER, G., et al. Psychosocial sequelae of the 1989 Newcastle earthquake: III. Role of vulnerability factors in post-disaster morbidity. *Psychological Medicine* (1997) 27:179–90.
- CARR, V., LEWIN, T., WEBSTER, R., KENARDY, J., HAZELL, P., and CARTER, G. Psychosocial sequelae of the 1989 Newcastle earthquake: II. Exposure and morbidity profiles during the first 2 years post-disaster. *Psychological Medicine* (1997) 27: 167–77.
- CATAPANO, F., MALAFRONTA, R., LEPRE, F., COZZOLINO, P., ARNONE, R., LORENZO, E. et al. Psychological consequences of the 1998 landslide in Sarno, Italy: A community study. *Acta Psychiatrica Scandinavica* (2001) 104:438–42.
- CHEEVER, K., and HARDIN, S. Effects of traumatic events, social support, and self-efficacy on adolescents' self-health assessments. *Western Journal of Nursing Research* (1999) 21:673–84.
- CHUNG, M., CHUNG, C., and EASTHOPE, Y. Traumatic stress and death anxiety among community residents exposed to an aircraft crash. *Death Studies* (2000) 24:689–704.
- CHUNG, M., EASTHOPE, Y., CHUNG, C., and CLARK-CARTER, D. Traumatic stress and coping strategies of sesternary victims following an aircraft disaster in Coventry. *Stress and Health* (2001) 17:67–75.
- CHUNG, M., FARMER, S., WERRETT, J., EASTHOPE, Y., and CHUNG, C. Traumatic stress and ways of coping of community residents exposed to a train disaster. *Australian and New Zealand Journal of Psychiatry* (2001) 35:528–34.
- CHUNG, M., WERRETT, J., FARMER, S., EASTHOPE, Y., and CHUNG, C. Responses to traumatic stress among community residents exposed to a train collision. *Stress Medicine* (2000) 16:17–25.
- CLAYER, J., BOOKLESS-PRATZ, C., and HARRIS, R. Some health consequences of a natural disaster. *Medical Journal of Australia* (1985) 143: 182–4.
- CLEARY, P., and HOUTS, P. The psychological impact of the Three Mile Island incident. *Journal of Human Stress* (1984) 10:28–34.
- COLLINS, D., BAUM, A., and SINGER, J. Coping with chronic stress at Three Mile Island: Psychological and biochemical evidence. *Health Psychology* (1983) 2:149–66.
- COOK, J., and BICKMAN, L. Social support and psychological symptomatology following a natural disaster. *Journal of Traumatic Stress* (1990) 3: 541–56.
- CORNELY, P., and BROMET, E. Prevalence of behavior problems in the three-year-old children living near Three Mile Island: A comparative analysis. *Journal of Child Psychology and Psychiatry and Allied Disciplines* (1986) 27:489–98.
- COWAN, M., and MURPHY, S. Identification of postdisaster bereavement risk predictors. *Nursing Research* (1985) 34:71–5.
- CREAMER, M., BURGESS, P., BUCKINGHAM, W., and PATTISON, P. Posttrauma reactions following a multiple shooting: A retrospective study and methodological inquiry. In J. Wilson and B. Raphael, eds., *International Handbook of Traumatic Stress Syndromes* (pp. 201–212). Plenum, 1993.
- CRUESS, S., ANTONI, M., KILBOURN, K., IRONSON, G., KLIMAS, N., FLETCHER, M., et al. Optimism, distress, and immunologic status in HIV-infected gay men following Hurricane Andrew. *International Journal of Behavioral Medicine* (2000) 7:160–82.
- DALGLEISH, T., JOSEPH, S., THRASHER, S., TRANAH, T., and YULE, W. Crisis support following the Herald of Free-Enterprise disaster: A longitudinal perspective. *Journal of Traumatic Stress* (1996) 9:833–45.
- DAVID, D., MELLMAN, T., MENDOZA, L., KULICK-BELL, R., IRONSON, G., and SCHNEIDERMAN, N. Psychiatric morbidity following Hurricane Andrew. *Journal of Traumatic Stress* (1996) 9: 607–12.
- DAVIDSON, L., and BAUM, A. Chronic stress and posttraumatic stress disorders. *Journal of Consulting and Clinical Psychology* (1986) 54:303–8.
- DAVIDSON, L., FLEMING, I., and BAUM, A. Post-traumatic stress as a function of chronic stress and toxic exposure. In C. Figley, ed., *Trauma and its wake* (pp. 57–77). Brunner/Mazel, 1985.
- DAVIDSON, L., FLEMING, I., and BAUM, A. Chronic stress, catecholamines, and sleep disturbance at Three Mile Island. *Journal of Human Stress* (1987) 13:75–83.

- DE LA FUENTE, R. The mental health consequences of the 1985 earthquakes in Mexico. *International Journal of Mental Health* (1990) 19:21-9.
- DEW, M., and BROMET, E. Predictors of temporal patterns of psychiatric distress during 10 years following the nuclear accident at Three Mile Island. *Social Psychiatry and Psychiatric Epidemiology* (1993) 28:49-55.
- DEW, M., BROMET, E., and SCHULBERG, H. A comparative analysis of two community stressors' long-term mental health effects. *American Journal of Community Psychology* (1987) 15:167-84.
- DOHRENWEND, B. P. Psychological implications of nuclear accidents: The case of Three Mile Island. *Bulletin of the New York Academy of Medicine* (1983) 59:1060-76.
- DOLINSKI, D., GROMSKI, W., and ZAWISZA, E. Unrealistic pessimism. *Journal of Social Psychology* (1987) 127:511-6.
- DOOLEY, E., and GUNN, J. The psychological effects of disaster at sea. *British Journal of Psychiatry* (1995) 167:233-7.
- DOUGALL, A., HERBERMAN, H., DELAHANTY, D., INSLICHT, S., and BAUM, A. Similarity of prior trauma exposure as a determinant of chronic stress responding to an airline disaster. *Journal of Consulting and Clinical Psychology* (2000) 68:290-5.
- DOUGALL, A., HYMAN, K., HAYWARD, M., MCFEELEY, S., and BAUM, A. Optimism and traumatic stress: The importance of social support and coping. *Journal of Applied Social Psychology* (2001) 31:223-45.
- DRABEK, T., and KEY, W. Conquering disasters: Family recovery and long-term consequences. Irvington, 1984.
- DURHAM, T., MCCAMMON, S., and ALLISON, E. Psychological impact of disaster on rescue personnel. *Psychiatry Digest* (1986) 4:27-9.
- DURKIN, M. E. Major depression and post-traumatic stress disorder following the Coalinga and Chile earthquakes: A cross-cultural comparison. *Journal of Social Behavior and Personality* (1993) 8:405-20.
- DURKIN, M. S., KHAN, N., DAVIDSON, L., ZAMAN, S., and STEIN, Z. The effects of a natural disaster on child behavior: Evidence for posttraumatic stress. *American Journal of Public Health* (1993) 83:1549-53.
- DYREGROV, A., KRISTOFFERSEN, J., and GJESTAD, R. Voluntary and professional disaster-workers: Similarities and differences in reactions. *Journal of Traumatic Stress* (1996) 9:541-55.
- ECHEBURA, E., DE CORRAL, P., SARASUA, B., and ZUBIZARRETA, I. Treatment of acute post-traumatic stress disorder in rape victims: An experimental study. *Journal of Anxiety Disorders* (1996) 10:185-99.
- ELKLIT, A. The aftermath of an industrial disaster. *Acta Psychiatrica Scandinavica* (1997) 96 (Suppl.):1-25.
- EPSTEIN, R., FULLERTON, C., and URSANO, R. Posttraumatic stress disorder following an air disaster: A prospective study. *American Journal of Psychiatry* (1998) 155:934-8.
- ERIKSSON, N., and LUNDIN, T. Early traumatic stress reactions among Swedish survivors of the m/s Estonia disaster. *British Journal of Psychiatry* (1996) 169:713-6.
- ERSLAND, S., WEISAETH, L., and SUND, A. The stress upon rescuers involved in an oil rig disaster: Alexander L. Kielland 1980. *Acta Psychiatrica Scandinavica* (1989) 80 (Suppl.):38-49.
- ESCOBAR, J., CANINO, G., RUBIO-STIPIC, M., and BRAVO, M. Somatic symptoms after a natural disaster: A prospective study. *American Journal of Psychiatry* (1992) 149:965-7.
- ETH, S., and PYNOOS, R. Developmental perspective on psychic trauma in childhood. In C. Figley, ed., *Trauma and Its Wake: Vol. 1. The Study and Treatment of Posttraumatic Stress Disorder*. Brunner/Mazel, 1985.
- EUSTACE, K., MACDONALD, C., and LONG, N. Cyclone Bola: A study of the psychological after-effects. *Anxiety, Stress, and Coping* (1999) 12:285-98.
- FOA, E., HEARST-IKEDA, D., and PERRY, K. Evaluation of a brief cognitive-behavioral program for the prevention of chronic PTSD in recent assault victims. *Journal of Consulting and Clinical Psychology* (1995) 63:948-55.
- FLEMING, R., BAUM, A., GISRIEL, M., and GATCHEL, R. Mediating influences of social support on stress at Three Mile Island. *Journal of Pediatric Psychology* (1982) 13:14-22.
- FREED, D., BOWLER, R., and FLEMING, I. Post-traumatic stress disorders as a consequence of a toxic spill in northern California. *Journal of Applied Social Psychology* (1998) 28:264-81.
- FREEDY, J., SALADIN, M., KILPATRICK, D., RESNICK, H., and SAUNDERS, B. Understanding acute psychological distress following natural disaster. *Journal of Traumatic Stress* (1994) 7:257-73.
- FREEDY, J., SHAW, D., JARRELL, M., and MASTERS, C. Towards an understanding of the psychological impact of natural disasters: An application of the Conservation of Resources stress model. *Journal of Traumatic Stress* (1992) 5:441-54.
- FULLERTON, C., URSANO, R., TZU-CHEG, K., and BHARTIYA, V. Disaster-related bereavement: Acute symptoms and subsequent depression. *Aviation, Space, and Environmental Medicine* (1999) 70:902-9.
- GALANTE, R., and FOA, D. An epidemiological study of psychic trauma and treatment effectiveness for children after a natural disaster. *Journal of the American Academy of Child Psychiatry* (1986) 25:357-63.
- GARRISON, C., BRYANT, E., ADDY, C.,

- SPURRIER, P., FREEDY, J., and KILPATRICK, D. Post-traumatic stress disorder in adolescents after Hurricane Andrew. *Journal of the American Academy of Child and Adolescent Psychiatry* (1995) 34:1193–201.
- GARRISON, C., WEINRICH, M., HARDIN, S., WEINRICH, S., and WANG, L. Post-traumatic stress disorder in adolescents after a hurricane. *American Journal of Epidemiology* (1993) 138:522–30.
- GILLESPIE, D., and MURTY, S. Cracks in a postdisaster service delivery network. *American Journal of Community Psychology* (1994) 22:639–60.
- GINEXI, E., WEIHS, K., SIMMENS, S., and HOYT, D. Natural disaster and depression: A prospective investigation of the reactions to the 1993 Midwest floods. *American Journal of Community Psychology* (2000) 28:495–518.
- GLESER, G., GREEN, B., and WINGET, C. *Prolonged Psychological Effects of Disaster: A Study of Buffalo Creek*. Academic Press, 1981.
- GOENJIAN, A., MOLINA, L., STEINBERG, A., FAIRBANKS, L., ALVEREZ, M., GOENJIAN, H., et al. Posttraumatic stress and depressive reactions among Nicaraguan adolescents after Hurricane Mitch. *American Journal of Psychiatry* (2001) 158:788–94.
- GOENJIAN, A., PYNOOS, R., STEINBERG, A., NAJARIAN, L., ASARNOW, J., KARAYAN, I., GHURABI, M., and FAIRBANKS, L. Psychiatric comorbidity in children after the 1988 earthquake in Armenia. *Journal of the American Academy of Child and Adolescent Psychiatry* (1995) 34:1174–84.
- GOENJIAN, A., STEINBERG, A., NAJARIAN, L., FAIRBANKS, L., TASHJIAN, M., and PYNOOS, R. Prospective study of posttraumatic stress, anxiety, and depressive reactions after earthquake and political violence. *American Journal of Psychiatry* (2000) 157:911–6.
- GREEN, B., FRIEDMAN, M., DE JONG, J., SOLOMON, S., KEANE, T., FAIRBANK, J., DONELAN, B., and FREY-WOUTERS, E. *Trauma in war and Peace: Prevention, practice, and policy*. Kluwer Academic/Plenum Publishers, in press.
- GREEN, B., GRACE, M., and GLESER, G. Identifying survivors at risk: Long-term impairment following the Beverly Hills Supper Club fire. *Journal of Consulting and Clinical Psychology* (1985) 53:672–8.
- GREEN, B., GRACE, M., LINDY, J., GLESER, G., LEONARD, A., and KRAMER, T. Buffalo Creek survivors in the second decade: Comparison with unexposed and nonlitigant groups. *Journal of Applied Social Psychology* (1990) 20:1033–50.
- GREEN, B., GRACE, M., VARY, M., KRAMER, T., GLESER, G., and LEONARD, A. Children of disaster in the second decade: A 17-year follow-up of Buffalo Creek survivors. *Journal of the American Academy of Child and Adolescent Psychiatry* (1994) 33:71–9.
- GREEN, B., KOROL, M., GRACE, M., VARY, M., LEONARD, A., GLESER, G., et al. Children and disaster: Age, gender, and parental effects on PTSD symptoms. *Journal of the American Academy of Child and Adolescent Psychiatry* (1991) 30:945–51.
- GREEN, B., LINDY, J., GRACE, M., GLESER, G., LEONARD, A., KOROL, M., et al. Buffalo Creek Survivors in the second decade: Stability of stress symptoms. *American Journal of Orthopsychiatry* (1990) 60:43–54.
- GREEN, B., and SOLOMON, S. The mental health impact of natural and technological disasters. In J. Freedy and S. Hobfoll, eds., *Traumatic Stress: From Theory to Practice* (pp. 163–180). Plenum, 1995.
- GREENING, L., and DOLLINGER, S. Illusions (and shattered illusions) of invulnerability: Adolescents in natural disaster. *Journal of Traumatic Stress* (1992) 5:63–75.
- GREGG, W., MEDLEY, I., FOWLER-DIXON, R., CURRAN, P., LOUGHREY, G., BELL, et al. Psychological consequences of the Kegworth air disaster. *British Journal of Psychiatry* (1995) 167:812–7.
- GRIEGER, T., STAAB, J., CARDENA, E., MCCARROLL, J., BRANDT, G., FULLERTON, C., and URSANO, R. Acute stress disorder and subsequent posttraumatic stress disorder in a group of exposed disaster workers. *Depression and Anxiety* (2000) 11:183–4.
- GUARNACCIA, P., CANINO, G., RUBIO-STIPEP, M., and BRAVO, M. The prevalence of *ataques de nervios* in the Puerto Rico disaster study: The role of culture in psychiatric epidemiology. *Journal of Nervous and Mental Disease* (1993) 181:157–65.
- HAGSTROM, R. The acute psychological impact on survivors following a train accident. *Journal of Traumatic Stress* (1995) 8:391–402.
- HANSON, R., KILPATRICK, D., FREEDY, J., and SAUNDERS, B. Los Angeles County after the 1992 civil disturbances: Degree of exposure and impact on mental health. *Journal of Consulting and Clinical Psychology* (1995) 63:987–96.
- HARDIN, S., WEINRICH, M., WEINRICH, S., HARDIN, T., and GARRISON, C. Psychological distress of adolescents exposed to Hurricane Hugo. *Journal of Traumatic Stress* (1994) 7:427–40.
- HAVENAAR, J., RUMYANTZEVA, G., VAN DEN BRINK, W., POELIJOE, N., VAN DEN BOUT, J., VAN ENGELAND, H., et al. Long-term mental health effects of the Chernobyl disaster: An epidemiologic survey in two former Soviet regions. *American Journal of Psychiatry* (1997) 154:1605–07.
- HELWEG-LARSEN, M. (The lack of) optimistic biases in response to the 1994 Northridge earthquake: The role of personal experience. *Basic and Applied Social Psychology* (1999) 21:119–29.
- HOBFOLE, S., and LILLY, R. Resource conservation as a strategy for community psychology. *Journal of Community Psychology* (1993) 21:128–48.
- HODGKINSON, P., and SHEPHERD, M. The

- impact of disaster support work. *Journal of Traumatic Stress* (1994) 7:587-600.
- HODGKINSON, P., and STEWART, M. *Coping with catastrophe: A handbook of post-disaster psychosocial aftercare, 2nd ed.* Routledge, 1998.
- HOLEN, A. A longitudinal study of the occurrence and persistence of post-traumatic health problems in disaster survivors. *Stress Medicine* (1991) 7:11-7.
- HOLMAN, E., and SILVER, R. Getting "stuck" in the past: Temporal orientation and coping with trauma. *Journal of Personality and Social Psychology* (1998) 74:1146-63.
- HOROWITZ, M. *Stress Response Syndromes.* Aronson, 1976.
- HOWARD, W., LOBERIZA, F., PFOHL, B., THORNE, P., MAGPANTAY, R., and WOOLSON, R. Initial results, reliability, and validity of a mental health survey of Mount Pinatubo disaster victims. *Journal of Nervous and Mental Disease* (1999) 187: 661-72.
- HUTCHINS, G., and NORRIS, F. Life change in the disaster recovery period. *Environment and Behavior* (1989) 21:33-56.
- INOUE-SAKURAI, C., MARUYAMA, S., and MORIMOTO, K. Posttraumatic stress and lifestyles are associated with natural killer cell activity in victims of the Hanshin-Awaji Earthquake in Japan. *Preventive Medicine* (2000) 31:467-73.
- IRONSON, G., WYNINGS, C., SCHNEIDERMAN, N., BAUM, A., RODRIGUEZ, M., GREENWOOD, D., et al. Posttraumatic stress symptoms, intrusive thoughts, loss, and immune function after Hurricane Andrew. *Psychosomatic Medicine* (1997) 59:128-41.
- JANOFF-BULMAN, R. The aftermath of victimization: Rebuilding shattered assumptions. In C. Figley, ed., *Trauma and Its Wake: Vol. 1. The Study and Treatment of Posttraumatic Stress Disorder.* Brunner/Mazel, 1985.
- JENEY-GAMMON, P., DAUGHERTY, T., FINCH, A., BELTER, R., and FOSTER, K. Children's coping styles and report of depressive symptoms following a natural disaster. *Journal of Genetic Psychology* (1993) 154:259-67.
- JENKINS, S. Coping and social support among emergency dispatchers: Hurricane Andrew. *Journal of Social Behavior and Personality* (1997) 12: 201-16.
- JOHNSEN, B., EID, J., LOVSTAD, T., and MICHELSEN, L. Posttraumatic stress symptoms in nonexposed, victims, and spontaneous rescuers after an avalanche. *Journal of Traumatic Stress* (1997) 10:133-40.
- JONES, D. Secondary disaster victims: The emotional effects of recovering and identifying human remains. *American Journal of Psychiatry* (1985) 142:303-7.
- JONES, R., FRARY, R., CUNNINGHAM, P., WEDDLE, J., and KAISER, L. The psychological effects of Hurricane Andrew on ethnic minority and Caucasian children and adolescents: A case study. *Cultural Diversity and Ethnic Minority Psychology* (2001) 7:103-8.
- JONES, R., and RIBBE, D. Child, adolescent, and adult victims of residential fire: Psychosocial consequences. *Behavior Modification* (1991) 15: 560-80.
- JONES, R., RIBBE, D., and CUNNINGHAM, P. Psychosocial correlates of fire disaster among children and adolescents. *Journal of Traumatic Stress* (1994) 7:117-22.
- JOSEPH, S., WILLIAMS, R., and YULE, W. Crisis support, attributional style, coping style, and post-traumatic symptoms. *Personality and Individual Differences* (1992) 13:1249-51.
- JOSEPH, S., YULE, W., WILLIAMS, R., and ANDREWS, B. Crisis support in the aftermath of disaster: A longitudinal perspective. *British Journal of Clinical Psychology* (1993) 32:177-85.
- KAISER, C., SATTLER, D., BELLACK, D., and DERSIN, J. A Conservation of Resources approach to a natural disaster: Sense of coherence and psychological distress. *Journal of Social Behavior and Personality* (1996) 11:459-76.
- KANIASTY, K., and NORRIS, F. A test of the support deterioration model in the context of natural disaster. *Journal of Personality and Social Psychology* (1993) 64:395-408.
- KANIASTY, K., NORRIS, F., and MURRELL, S. Perceived and received social support following natural disaster. *Journal of Applied Social Psychology* (1990) 20:85-114.
- KARANCI, A., ALKAN, N., AKSIT, B., SUCUOGLU, H., and BALTA, E. Gender differences in psychological distress, coping, social support and related variables following the 1995 Dinal (Turkey) earthquake. *North American Journal of Psychology* (1999) 1:189-204.
- KATO, H., ASUKAI, N., MIYAKE, Y., MINAKAWA, K., and NISHIYAMA, A. Post-traumatic symptoms among younger and elderly evacuees in the early stages following the 1995 Hanshin-Awaji earthquake in Japan. *Acta Psychiatrica Scandinavica* (1996) 93:477-81.
- KHOURY, E., WARHEIT, G., HARGROVE, M., ZIMMERMAN, R., VEGA, W., and GIL, A. The impact of Hurricane Andrew on deviant behavior among a multi-racial/ethnic sample of adolescents in Dade County, Florida: A longitudinal analysis. *Journal of Traumatic Stress* (1997) 10:71-91.
- KITAYAMA, S., OKADA, Y., TAKUMI, T., TAKADA, S., INAGAKI, Y., and NAKAMURA, H. Psychological and physical reactions of children after the Hanshin-Awaji earthquake disaster. *Kobe Journal of Medical Sciences* (2000) 46:189-200.
- KNIGHT, B., GATZ, M., HELLER, K., and BENGTON, V. Age and emotional response to the Northridge earthquake: A longitudinal analysis. *Psychology and Aging* (2000) 15:627-34.

- KOOPMAN, C., CLASSEN, C., and SPIEGEL, D. Dissociative responses in the immediate aftermath of the Oakland/Berkeley firestorm. *Journal of Traumatic Stress* (1996) 9:521–40.
- KOOPMAN, C., CLASSEN, C., and SPIEGEL, D. Multiple stressors following a disaster and dissociative symptoms. In C. Fullerton and R. Ursano, eds., *Posttraumatic Stress Disorder: Acute and Long-Term Responses to Trauma and Disaster* (pp. 21–35). American Psychiatric Press, 1997.
- KOSCHEYEV, V., MARTENS, V., KOSENKOV, A., LARTZEV, M., and LEON, G. Psychological status of Chernobyl nuclear power plant operators after the nuclear disaster. *Journal of Traumatic Stress* (1993) 6:561–8.
- KRAUSE, N. Exploring the impact of a natural disaster on the health and psychological well-being of older adults. *Journal of Human Stress* (1987) 13:61–9.
- KWON, Y., MARUYAMA, S., and MORIMOTO, K. Life events and posttraumatic stress in Hanshin-Awaji earthquake victims. *Environmental Health and Preventive Medicine* (2001) 6:97–103.
- LA GRECA, A. Children experiencing disasters: Prevention and intervention. In J. Hughes, A. La Greca, and J. Conley, eds., *Handbook of Psychological Services for Children and Adolescents*. Oxford University Press, 2001.
- LA GRECA, A., SILVERMAN, W., VERNBERG, E., and PRINSTEIN, M. Symptoms of post-traumatic stress in children after Hurricane Andrew: A prospective study. *Journal of Consulting and Clinical Psychology* (1996) 64:712–23.
- LA GRECA, A., SILVERMAN, W., and WASERSTEIN, S. Children's predisaster functioning as a predictor of posttraumatic stress following Hurricane Andrew. *Journal of Consulting and Clinical Psychology* (1998) 66:883–92.
- LA GRECA, A., VERNBERG, E., SILVERMAN, W., and PRINSTEIN, M. *Helping Children Prepare and Cope with Natural Disasters: A Manual for School Personnel*. (Available from A. La Greca, University of Miami, P.O. Box 249229, Coral Gables, FL 33124; 1994).
- LESACA, T. Symptoms of stress disorder and depression among trauma counselors after an airline disaster. *Psychiatric Services* (1996) 47:424–6.
- LEWIN, T., CARR, V., and WEBSTER, R. Recovery from post-earthquake psychological morbidity: Who suffers and who recovers? *Australian and New Zealand Journal of Psychiatry* (1998) 32:15–20.
- LIMA, B., SANTACRUZ, H., LOZANO, J., CHAVEZ, H., SAMANIEGO, N., POMPEI, M., and PAI, S. Disasters and mental health: Experience in Columbia and Ecuador and its relevance for primary care in mental health in Latin America. *International Journal of Mental Health* (1990) 19:3–20.
- LIMA, B., PAI, S., SANTACRUZ, H., and LOZANO, J. Psychiatric disorders among poor victims following a major disaster: Armero, Columbia. *Journal of Nervous and Mental Disease* (1991) 179:420–7.
- LINDEMAN, M., SAARI, S., VERKASALO, M., and PRYTZ, H. Traumatic stress and its risk factors among peripheral victims of the M/S Estonia disaster. *European Psychologist* (1996) 1:255–70.
- LITCHER, L., BROMET, E., CARLSON, G., SQUIRES, N., GOLDBABER, D., PANINA, N., GOLOVAKHA, E., and GLUZMAN, S. School and neuropsychological performance of evacuated children in Kyiv 11 years after the Chernobyl disaster. *Journal of Child Psychology and Psychiatry and Allied Disciplines* (2000) 41:291–9 (March 2000).
- LITZ, B., GRAY, M., BRYANT, R., and ADLER, A. Early intervention for trauma: Current status and future directions. *Clinical Psychology: Science and Practice*, (2002) 9:112–34.
- LIVINGSTON, H., LIVINGSTON, M., and FELL, S. The Lockerbie disaster: A 3-year follow-up of elderly victims. *International Journal of Geriatric Psychiatry* (1994) 9:989–94.
- LOGUE, J., HANSEN, H., and STRUENING, E. Some indications of the long-term health effects of a natural disaster. *Public Health Reports* (1981) 96:67–79.
- LONIGAN, C., SHANNON, M., TAYLOR, C., FINCH, A., and SALLEE, F. Children exposed to disaster: II. Risk factors for the development of post-traumatic symptomology. *Journal of the American Academy of Child and Adolescent Psychiatry* (1994) 33:94–105.
- LUTGENDORF, S., ANTONI, M., IRONSON, G., FLETCHER, M., PENEDO, F., BAUM, A., SCHNEIDERMAN, N., and KLIMAS, N. Physical symptoms of chronic fatigue syndrome are exacerbated by the stress of Hurricane Andrew. *Psychosomatic Medicine* (1995) 57:310–23.
- MADAKASIRA, S., and O'BRIEN, K. Acute posttraumatic stress disorder in victims of a natural disaster. *Journal of Nervous and Mental Disease* (1987) 175:286–90.
- MAES, M., DELMEIRE, L., SCHOTTE, C., JANCA, A., CRETEN, T., MYLLE, J., STRUYF, A., PISON, G., and ROUSSEEUW, P. Epidemiological and phenomenological aspects of post-traumatic stress disorder: DSM-III-R diagnosis and diagnostic criteria not validated. *Psychiatry Research* (1998) 81:179–93.
- MAES, M., MYLLE, J., DELMEIRE, L., and ALTAMURA, C. Psychiatric morbidity and comorbidity following accidental man-made traumatic events: Incidence and risk factors. *European Archives of Psychiatry and Clinical Neuroscience* (2000) 250:156–62.
- MAES, M., MYLLE, J., DELMEIRE, L., and JANCA, A. Pre- and post-disaster negative life events in relation to the incidence and severity of posttraumatic stress disorder. *Psychiatry Research* (2001) 105:1–12.

- MARCH, J., AMAYA-JACKSON, L., TERRY, R., and COSTANZO, P. Posttraumatic symptomatology in children and adolescents after an industrial fire. *Journal of the American Academy of Child and Adolescent Psychiatry* (1997) 36:1080-8.
- MARMAR, C., WEISS, D., METZLER, T., RONFELDT, H., and FOREMAN, C. Stress responses of emergency services personnel to the Loma Prieta earthquake interstate 880 freeway collapse and control traumatic incidents. *Journal of Traumatic Stress* (1996) 9:63-85.
- MAYOU, R. A., EHLERS, A., and HOBBS, M. Psychological debriefing for road traffic accident victims. *British Journal of Psychiatry* (2000) 176: 589-93.
- MCCARROLL, J., FULLERTON, C., UR-SANO, R., and HERMSEN, J. Posttraumatic stress symptoms following forensic dental identification: Mt. Carmel, Waco, Texas. *American Journal of Psychiatry* (1996) 153:778-82.
- McFARLANE, A. Posttraumatic phenomena in a longitudinal study of children following a natural disaster. *Journal of the American Academy of Child and Adolescent Psychiatry* (1987) 26:764-9.
- McFARLANE, A. The aetiology of post-traumatic morbidity: Predisposing, precipitating and perpetuating factors. *British Journal of Psychiatry* (1989) 154:221-8.
- McFARLANE, A., and HUA, C. Study of a major disaster in the People's Republic of China: The Yunnan Earthquake. In J. Wilson and B. Raphael, eds., *International Handbook of Traumatic Stress Syndromes* (pp. 493-498). Plenum, 1993.
- McFARLANE, A., and PAPAY, P. Multiple diagnoses in posttraumatic stress disorder in the victims of a natural disaster. *Journal of Nervous and Mental Disease* (1992) 180:498-504.
- McMILLEN, J., NORTH, C., and SMITH, E. What parts of PTSD are normal: Intrusion, avoidance, or arousal? Data from the Northridge, California, earthquake. *Journal of Traumatic Stress* (2000) 13:57-75.
- MELLMAN, T., DAVID, D., KULICK-BELL, R., HEBDING, J., and NOLAN, B. Sleep disturbance and its relationship to psychiatric morbidity after Hurricane Andrew. *American Journal of Psychiatry* (1995) 152:1659-63.
- MORGAN, I., MATTHEWS, G., and WINTON, M. Coping and personality as predictors of post-traumatic intrusions, numbing, avoidance and general distress: A study of victims of the Perth Flood. *Behavioural and Cognitive Psychotherapy* (1995) 23:251-64.
- MURPHY, S. Stress levels and health status of victims of a natural disaster. *Research in Nursing and Health* (1984) 7:205-15.
- MURPHY, S. Health and recovery status of victims one and three years following a natural disaster. In C. Figley, ed., *Trauma and its Wake: Vol. II. Traumatic Stress, Theory, Research, and Intervention* (pp.133-155). Bruner/Mazel, 1985.
- MURPHY, S. Mediating effects of intrapersonal and social support on mental health 1 and 3 years after a natural disaster. *Journal of Traumatic Stress* (1988) 1:155-72.
- NADER, K., PYNOOS, R., FAIRBANKS, L., and FREDERICK, C. Children's PTSD reactions one year after a sniper attack in their school. *American Journal of Psychiatry* (1990) 147:1526-30.
- NAJARIAN, B., GOENJIAN, A., PELCOVITZ, D., MANDEL, F., and NAJARIAN, B. The effect of relocation after a natural disaster. *Journal of Traumatic Stress* (2001) 14:511-26.
- NAJARIAN, L., GOENJIAN, A., PELCOVITZ, D., MANDEL, F., and NAJARIAN, B. Relocation after a disaster: Posttraumatic stress disorder in Armenia after the earthquake. *Journal of the American Academy of Child and Adolescent Psychiatry* (1996) 35: 374-83.
- NOLEN-HOEKSEMA, S., and MORROW, J. A prospective study of depression and posttraumatic stress symptoms after a natural disaster: The 1989 Loma Prieta earthquake. *Journal of Personality and Social Psychology* (1991) 61: 115-21.
- NORRIS, F. The epidemiology of trauma: Frequency and impact of different potentially traumatic events on different demographic groups. *Journal of Consulting and Clinical Psychology* (1992) 60:409-18.
- NORRIS, F., FRIEDMAN, M., WATSON, P., BYRNE, C., DIAZ, E., and KANIASTY, K. 60,000 disaster victims speak: Part I. An empirical review of the empirical literature, 1981-2001. *Psychiatry* (2002) 65:000-000 (this volume).
- NORRIS, F., FRIEDMAN, M., and WATSON, P. 60,000 disaster victims speak: Part II. Summary and implications of the disaster mental health research. *Psychiatry* (2002) 65:000-000 (this volume).
- NORRIS, F., and KANIASTY, K. Received and perceived social support in times of stress: A test of the social support deterioration deterrence model. *Journal of Personality and Social Psychology* (1996) 71: 498-511.
- NORRIS, F., KANIASTY, K., CONRAD, M., INMAN, G., and MURPHY, A. Placing age differences in cultural context: A comparison of the effects of age on PTSD after disasters in the U.S., Mexico, and Poland. *Journal of Clinical Geropsychology* (2002) 8:153-73.
- NORRIS, F., and MURRELL, S. Prior experience as a moderator of disaster impact on anxiety symptoms in older adults. *American Journal of Community Psychology* (1988) 16:665-83.
- NORRIS, F., PERILLA, J., RIAD, J., KANIASTY, K., and LAVIZZO, E. Stability and change in stress, resources, and psychological distress following natural disaster: Findings from Hurricane Andrew. *Anxiety, Stress, and Coping* (1999) 12:363-96.
- NORRIS, F., PERILLA, J., IBANEZ, G., and

- MURPHY, A. Sex differences in symptoms of post-traumatic stress: Does culture play a role? *Journal of Traumatic Stress* (2001) 14:7–28.
- NORRIS, F., PHIFER, J., and KANIASTY, K. Individual and community reactions to the Kentucky floods: Findings from a longitudinal study of older adults. In R. Ursano, B. McCaughey, and C. Fullerton, eds., *Individual and Community Responses to Trauma and Disaster: The Structure of Human Chaos*. Cambridge: Cambridge University Press, 1994.
- NORRIS, F., SMITH, T., and KANIASTY, K. Revisiting the experience-behavior hypothesis: The effects of Hurricane Hugo on hazard preparedness and other self-protective acts. *Basic and Applied Social Psychology* (1999) 21:37–47.
- NORRIS, F., and UHL, G. Chronic stress as a mediator of acute stress: The case of Hurricane Hugo. *Journal of Applied Social Psychology* (1993) 23: 1263–84.
- NORTH, C., NIXON, S., SHARIAT, S., MAL- LONEE, S., McMILLEN, J., SPITZNAGEL, E., et al. Psychiatric disorders among survivors of the Oklahoma City bombing. *Journal of the American Medical Association* (1999) 282:755–62.
- NORTH, C., SMITH, E., and SPITZNAGEL, E. Posttraumatic stress disorder in survivors of a mass shooting. *American Journal of Psychiatry* (1994) 151:82–8.
- NORTH, C., SMITH, E., and SPITZNAGEL, E. One-year follow-up of survivors of a mass shooting. *American Journal of Psychiatry* (1997) 154: 1696–702.
- NORTH, C., SPITZNAGEL, E., and SMITH, E. A prospective study of coping after exposure to a mass murder episode. *Annals of Clinical Psychiatry* (2001) 13: 81–7.
- NUNN, K., LEWIN, T., WALTON, J., and CARR, V. The construction and characteristics of an instrument to measure personal hopefulness. *Psychological Medicine* (1996) 26:531–46.
- OLLENDICK, D., and HOFFMAN, M. Assessment of psychological reactions in disaster victims. *Journal of Community Psychology* (1982) 10:157–67.
- PALINKAS, L., RUSSELL, J., DOWNS, M., and PETTERSON, J. Ethnic differences in stress, coping, and depressive symptoms after the Exxon Valdez oil spill. *Journal of Nervous and Mental Disease* (1992) 180:287–95.
- PALINKAS, L., DOWNS, M., PETTERSON, J., and RUSSELL, J. Social, cultural, and psychological impacts of the Exxon Valdez oil spill. *Human Organization* (1993) 52:1–13.
- PERILLA, J., NORRIS, F., and LAVIZZO, E. Ethnicity, culture, and disaster response: Identifying and explaining ethnic differences in PTSD six months after Hurricane Andrew. *Journal of Social and Clinical Psychology* (2002) 21:20–45.
- PFEFFERBAUM, B., and DOUGHTY, D. Increased alcohol use in a treatment sample of Okla- homa City bombing victims. *Psychiatry* (2001) 64: 296–303.
- PFEFFERBAUM, B., NIXON, S., TIVIS, R., DOUGHTY, D., PYNOOS, R., GURWITCH, R., and FOY, D. Television exposure in children after a terrorist incident. *Psychiatry* (2001) 64:202–11.
- PFEFFERBAUM, B., SEALE, T., McDONALD, N., BRANDT, E., RAINWATER, S., MAYNARD, B., et al. Posttraumatic stress two years after the Okla- homa City bombing in youths geographically dis- tant from the explosion. *Psychiatry* (2000) 63: 358–70.
- PHIFER, J. Psychological distress and som- atic symptoms after natural disaster: Differential vulnerability among older adults. *Psychology and Aging* (1990) 5:412–20.
- PHIFER, J., KANIASTY, K., and NORRIS, F. The impact of natural disaster on the health of older adults: A multiwave prospective study. *Journal of Health and Social Behavior* (1988) 29:65–78.
- PHIFER, J., and NORRIS, F. Psychological symptoms in older adults following disaster: Nature, timing, duration, and course. *Journal of Gerontology: Social Science* (1989) 44:207–17.
- PICKENS, J., FIELD, T., PRODROMIDIS, M., PELAEZ-NOGUERAS, M., and HOSSAIN, Z. Post- traumatic stress, depression and social support among college students after Hurricane Andrew. *Journal of College Student Development* (1995) 36: 152–61.
- POWELL, B., and PENICK, E. Psychological distress following a natural disaster: A one-year follow-up of 98 flood victims. *Journal of Community Psychology* (1983) 11:269–76.
- PYNOOS, R., FREDERICK, C., NADER, K., ARROYO, W., STEINBER, A., ETH, S., et al. Life threat and posttraumatic stress in school-age chil- dren. *Archives of General Psychiatry* (1987) 44: 1057–63.
- PYNOOS, R., GOENJIAN, A., TASHJIAN, M., KARAKASHIAN, M., MANJIKIAN, R., MANOUKIAN, G., et al. Post-traumatic stress reactions in children after the 1988 Armenian earthquake. *British Journal of Psychiatry* (1993) 163:239–47.
- RAPHAEL, B., SINGH, B., BRADBURY, L., and LAMBERT, F. Who helps the helpers? The ef- fects of a disaster on the rescue workers. *OMEGA* (1983–1984) 14:9–20.
- RIAD, J., and NORRIS, F. The influence of relocation on the environmental, social, and psy- chological stress experienced by disaster victims. *Environment and Behavior* (1996) 28:163–82.
- RIAD, J., NORRIS, F., and RUBACK, B. Pre- dicting evacuation following two major disasters: The roles of risk perceptions, social influence, and resources. *Journal of Applied Social Psychology* (1999) 29:918–34.
- ROBINS, L., FISCHBACH, R., SMITH, E., COTTLER, L., SOLOMON, S., and GOLDRING, E. Impact of disaster on previously assessed mental

health. In J. Shore, ed., *Disaster Stress Studies: New Methods and Findings* (pp. 21–48). American Psychiatric Press, 1986.

ROSE, S., BISSON, J., and WESSELEY, S. Psychological debriefing for preventing post traumatic stress disorder (PTSD). *Cochrane Database of Systematic Reviews* [Online version], 2001.

ROSE, S., BREWIN, C., ANDREWS, B., and KIRK, M. A randomized controlled trial of individual psychological debriefing for victims of violent crime. *Psychological Medicine* (1999) 29:793–9.

RUBONIS, A., and BICKMAN, L. Psychological impairment in the wake of disaster: The disaster-psychopathology relationship. *Psychological Bulletin* (1991) 109:384–99.

RUSTEMLI, A., and KARANCI, A. Distress reactions and earthquake-related cognitions of parents and their adolescent children in a victimized population. *Journal of Social Behavior and Personality* (1996) 11:767–80.

SANCHEZ, J., KORBIN, W., and VISCARRA, D. Corporate support in the aftermath of a natural disaster of natural disaster: Effects on employee strains. *Academy of Management Journal* (1995) 38: 504–21.

SAROJA, K., KASMINI, K., MUHAMAD, S., and ZULKIFLI, G. Relationship of stress experienced by rescue workers in the Highland Towers condominium collapse to probable risk factors: A preliminary report. *Medical Journal of Malaysia* (1995) 50:326–9.

SATTLER, D., SATTLER, J., KAISER, C., HAMBY, B., ADAMS, M., LOVE, L., et al. Hurricane Andrew: Psychological distress among shelter victims. *International Journal of Stress Management* (1995) 2:133–43.

SAYLOR, C., SWENSON, C., and POWELL, P. Hurricane Hugo blows down the broccoli: Preschooler's post-disaster play and adjustment. *Child Psychiatry and Human Development* (1992) 22: 139–49.

SCHWARZ, E., and KOWALSKI, J. 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* (1991) 148:592–7.

SCOTT, R., BROOKS, N., and MCKINLAY, W. Post-traumatic morbidity in a civilian community of litigants: A follow-up at 3 years. *Journal of Traumatic Stress* (1995) 8:403–17.

SEGERSTROM, S., SOLOMON, G., KEMENY, M., and FAHEY, J. Relationship of worry to immune sequelae of the Northridge Earthquake. *Journal of Behavioral Medicine* (1998) 21:433–50.

SELLEY, C., KING, E., PEVELER, R., OSOLA, K., MARTIN, N., and THOMPSON, C. Posttraumatic stress disorder symptoms and the Clapham rail accident. *British Journal of Psychiatry* (1997) 171:478–82.

SHALEV, A., and URSANO, R. Mapping the

multidimensional picture of acute responses to traumatic stress. In U. Schneider, ed., *Early Intervention for Psychological Trauma*. Oxford University Press, in press.

SHANNON, M., LONIGAN, C., FINCH, A., and TAYLOR, C. Children exposed to disaster: I. Epidemiology of post-traumatic symptoms and symptom profiles. *Journal of the American Academy of Child and Adolescent Psychiatry* (1994) 33:80–93.

SHARAN, P., CHAUDHARY, G., KAVATHEKAR, S., and SAXENA, S. Preliminary report of psychiatric disorders in survivors of a severe earthquake. *American Journal of Psychiatry* (1996) 153: 556–8.

SHARIAT, S., MALLONEE, S., KRUGER, E., FARMER, K., and NORTH, C. A prospective study of long-term health outcomes among Oklahoma City bombing survivors. *Journal of the Oklahoma State Medical Association* (1999) 92:178–86.

SHAW, J., APPLGATE, B., and SCHORR, C. Twenty-one-month follow-up study of school-age children exposed to Hurricane Andrew. *Journal of the American Academy of Child and Adolescent Psychiatry* (1996) 34:359–64.

SHAW, J., APPLGATE, B., TANNER, S., PEREZ, D., ROTHE, E., COMPO-BOWEN, A., et al. Psychological effects of Hurricane Andrew on elementary school population. *Journal of the American Academy of Child and Adolescent Psychiatry* (1995) 35:1185–92.

SHORE, J., TATUM, E., and VOLLMER, W. Psychiatric reactions to disaster: The Mount St. Helens experience. *American Journal of Psychiatry* (1986) 143:590–5.

SIEGEL, J., SHOAF, K., and BOURQUE, L. (2000). The C-Mississippi Scale for PTSD in post-earthquake communities. *International Journal of Mass Emergencies and Disasters* (2000) 18:339–46.

SIMS, A., and SIMS, D. The phenomenology of posttraumatic stress disorder: A symptomatic study of 70 victims of psychological trauma. *Psychopathology* (1998) 31:96–112.

SLOAN, I., ROZENSKY, R., KAPLAN, L., and SAUNDERS, S. A shooting incident in an elementary school: Effects of worker stress on public safety, mental health, and medical personnel. *Journal of Traumatic Stress* (1994) 7:565–74.

SLOAN, P. Posttraumatic stress in survivors of an airplane crash-landing: A clinical and exploratory research intervention. *Journal of Traumatic Stress* (1988) 1:211–29.

SMITH, B. Coping as a predictor of outcomes following the 1993 Midwest flood. *Journal of Social Behavior and Personality* (1996) 11:225–29.

SMITH, B., and FREEDY, J. Psychosocial resource loss as a mediator of the effects of flood exposure on psychological distress and physical symptoms. *Journal of Traumatic Stress* (2000) 13: 349–57.

SMITH, D., CHRISTIANSEN, E., VINCENT,

- R., and HANN, N. Population effects of the bombing of Oklahoma City. *Journal of the Oklahoma State Medical Association* (1999) 92:193-8.
- SMITH, E., NORTH, C., MCCOOL, R., and SHEA, J. Acute postdisaster psychiatric disorders: Identification of persons at risk. *American Journal of Psychiatry* (1990) 147:202-6.
- SMITH, E., NORTH, C., and SPITZNAGEL, E. Post-traumatic stress in survivors of three disasters. *Journal of Social Behavior and Personality* (1993) 8:353-68.
- SMITH, E., ROBINS, L., PRZYBECK, T., GOLDRING, E., and SOLOMON, S. Psychosocial consequences of a disaster. In J. H. Shore, ed., *Disaster Stress Studies: New Methods and Findings* (pp. 49-76). American Psychiatric Press, 1986.
- SOLOMON, M., and THOMPSON, J. Anger and blame in three technological disasters. *Stress Medicine* (1995) 11:199-206.
- SOLOMON, S. Gender differences in response to disaster. In G. Weidner, S. Kopp, and M. Kristenson, eds., *Heart Disease: Environment, Stress and Gender*. NATO Science Series I: Life and Behavioural Sciences, Vol. 327, 2002.
- SOLOMON, S., BRAVO, M., RUBIO-STIPEC, M., and CANINO, G. Effect of family role on response to disaster. *Journal of Traumatic Stress* (1993) 6:255-69.
- SOLOMON, S., REGIER, D., and BURKE, J. Role of perceived control in coping with disasters. *Journal of Social and Clinical Psychology* (1989) 8: 376-92.
- SOLOMON, S., SMITH, E., ROBINS, L., and FISCHBACH, R. Social involvement as a mediator of disaster-induced stress. *Applied Journal of Social Psychology* (1987) 17:1092-1112.
- SOLOMON, Z. Stress, social support and affective disorders in mothers of pre-school children: A test of the stress-buffering effect of social support. *Social Psychiatry* (1985) 20:100-5.
- SOLOMON, Z., IANCU, I., and TYANO, S. World assumptions following disaster. *Journal of Applied Social Psychology* (1997) 27:1785-98.
- SOMASUNDARAM, D., NORRIS, F., ASUKAI, N., and MURTHY, R. Natural and technological disasters. In B. L. Green, M. Friedman, J. de Jong, S. Solomon, T. Keane, J. Fairbank, B. Donelan, and E. Frey-Wouters, *Trauma in War and Peace: Prevention, Practice, and Policy*, Kluwer Academic/Plenum Publishers, in press.
- SPURRELL, M., and MCFARLANE, A. Post-traumatic stress disorder and coping after a natural disaster. *Social Psychiatry and Psychiatric Epidemiology* (1993) 28:194-200.
- STAAB J., GRIEGER, T., FULLERTON, C., and URSANO, R. Acute stress disorder, subsequent posttraumatic stress disorder and depression after a series of typhoons. *Anxiety* (1996) 2:219-25.
- STEINGLASS, P., and GERRITY, E. Natural disaster and post-traumatic stress disorder: Short-term versus long-term recovery in two disaster-affected communities. *Journal of Applied Social Psychology* (1990) 20:1746-65.
- STERN, J. *The ultimate terrorists*. Harvard University Press. 1999.
- SUNGUR, M., and KAYA, B. The onset and longitudinal course of a man-made posttraumatic morbidity: Survivors of the Sivas disaster. *International Journal of Psychiatry in Clinical Practice* (2001) 5:195-202.
- SWENSON, C., SAYLOR, C., POWELL, M., STOKES, S., FOSTER, K., and BELTER, R. Impact of a natural disaster on preschool children: Adjustment 14 months after a hurricane. *American Journal of Orthopsychiatry* (1996) 66:122-30.
- TAYLOR, A., and FRAZER, A. The stress of postdisaster body handling and victim identification work. *Journal of Human Stress* (1982) 8:4-12.
- THOMPSON, J., CHUNG, M., and ROSSER, R. Psychological effects of the Marchioness disaster on survivors and relatives. *European Journal of Psychiatry* (1995) 9:197-208.
- THOMPSON, M., NORRIS, F., and HANACEK, B. Age differences in the psychological consequences of Hurricane Hugo. *Psychology and Aging* (1993) 8:606-16.
- TICEHURST, S., WEBSTER, R., CARR, V., and LEWIN, T. The psychosocial impact of an earthquake on the elderly. *International Journal of Geriatric Psychiatry* (1996) 11:943-51.
- TOBIN, G., and OLLENBURGER, J. Predicting levels of postdisaster stress in adults following the 1993 floods in the upper midwest. *Environment and Behavior* (1996) 28:340-57.
- TRAPPLER, B., and FRIEDMAN, S. Posttraumatic stress disorder in survivors of the Brooklyn Bridge shooting. *American Journal of Psychiatry* (1996) 153:705-7.
- TUCKER, P., DICKSON, W., PFEFFERBAUM, B., McDONALD, N., and ALLEN, G. Traumatic reactions as predictors of posttraumatic stress six months after the Oklahoma City bombing. *Psychiatric Services* (1997) 48:1191-4.
- TURNER, S., THOMPSON, J., and ROSSER, R. The Kings Cross fire: Psychological reactions. *Journal of Traumatic Stress* (1995) 8:419-27.
- TYLER, K., and HOYT, D. The effect of an acute stressor on depressive symptoms among older adults: The moderating effects of social support and age. *Research on Aging* (2000) 22:143-64.
- UDWIN, O., BOYLE, S., YULE, W., BOLTON, D., and O'RYAN, D. Risk factors for long-term psychological effects of a disaster experienced in adolescence: Predictors of PTSD. *Journal of Child Psychology and Psychiatry and Allied Disciplines* (2000) 41:969-79.
- ULLMAN, J., and NEWCOMB, M. I felt the earth move: A prospective study of the 1994 Northridge Earthquake. In P. Cohen, C. Slomkowski, and L. Robins, eds., *Historical and Geographical In-*

- fluences on Psychopathology* (pp. 217–246). Erlbaum, 1999.
- URSANO, R., MCCAUGHE, B., and FULLERTON, C. (Eds.), *Individual and Community Responses to Trauma and Disaster: The Structure of Human Chaos*. Cambridge University Press, 1994.
- URSANO, R., FULLERTON, C., KAO, T., and BHARTY, V. Longitudinal assessment of posttraumatic stress disorder and depression after exposure to traumatic death. *Journal of Nervous and Mental Disease* (1995) 183:36–42.
- URSANO, R., FULLERTON, C., and NORWOOD, A. *Planning for bioterrorism: Individual and Community Response*. Cambridge University Press, in press.
- VERNBERG, E., LA GRECA, A., SILVERMAN, W., and PRINSTEIN, M. Prediction of posttraumatic stress symptoms in children after Hurricane Andrew. *Journal of Abnormal Psychology* (1996) 105: 237–48.
- VILA, G., WITKOWSKI, P., TONDINI, M., PEREZ-DIAZ, F., MOUREN-SIMEONI, M., and JOUVENT, R. A study of posttraumatic disorders in children who experienced an industrial disaster in the Briey region. *European Child and Adolescent Psychiatry* (2001) 10:10–18.
- WAEDELDE, L., KOOPMAN, C., RIERDAN, J., and SPIEGEL, D. Symptoms of acute stress disorder and posttraumatic stress disorder following exposure to disastrous flooding. *Journal of Trauma and Dissociation* (2001) 2:37–52.
- WANG, X., GAO, L., SHINFUKU, N., ZHANG, H., ZHAO, C., and SHEN, Y. Longitudinal study of earthquake-related PTSD in a randomly selected community sample in North China. *American Journal of Psychiatry* (2000) 157:1260–6.
- WARHEIT, G., ZIMMERMAN, R., KHOURY, E., VEGA, W., and GIL, A. Disaster related stresses, depressive signs and symptoms, and suicidal ideation among a multi-racial/ethnic sample of adolescents: A longitudinal analysis. *Journal of Child Psychology and Psychiatry and Allied Disciplines* (1996) 37:435–44.
- WASSERSTEIN, S., and LA GRECA, A. Hurricane Andrew: Parent conflict as a moderator of children's adjustment. *Hispanic Journal of Behavioral Science* (1998) 20:212–24.
- WATTS, R., and WILSON, M. The Kempsey bus disaster: The effects on Australian community rescuers. In E. Zinner and M. Williams, eds., *When a Community Weeps: Case Studies in Group Survivorship* (pp. 72–85). Brunner/Mazel, 1999.
- WEBSTER, R., McDONALD, R., LEWIN, T., and CARR, V. Effects of a natural disaster on immigrants and host population. *Journal of Nervous and Mental Disease* (1995) 183:390–7.
- WEINSTEIN, N., LYON, J., ROTHMAN, A., and CUTTE, C. Changes in perceived vulnerability following natural disaster. *Journal of Social and Clinical Psychology* (2000) 19:372–95.
- WEISAETH, L. The stressors and the post-traumatic stress syndrome after an industrial disaster. *Acta Psychiatrica Scandinavica* (1989a) 80(Suppl.): 25–37.
- WEISAETH, L. Torture of a Norwegian ship's crew: The torture, stress reactions and psychiatric after-effects. *Acta Psychiatrica Scandinavica* (1989b) 80(Suppl.):63–72.
- WEISS, D., MARMAR, C., METZLER, T., and RONFELDT, H. Predicting symptomatic distress in emergency services personnel. *Journal of Consulting and Clinical Psychology* (1995) 63:361–8.
- WOOD, J., BOOTZIN, R., ROSENHAN, D., NOLEN-HOEKSEMA, S., and JOURDEN, F. Effects of the 1989 San Francisco earthquake on frequency and content of nightmares. *Journal of Abnormal Psychology* (1992) 101:219–24.
- YULE, W., BOLTON, D., UDWIN, O., O'RYAN, D., and NURRISH, J. The long-term psychological effects of a disaster experienced in adolescence: I. The incidence and course of PTSD. *Journal of Child Psychology and Psychiatry and Allied Disciplines* (2000) 41:503–11.