

Natural Hazard Research

THE PSYCHOSOCIAL PROCESS OF ADJUSTING
TO NATURAL DISASTERS

by

Lewis Aptekar
San Jose State University

March 1991



Working Paper #70

PREFACE

This paper is one of a series on research in progress in the field of human adjustments to natural hazards. The series is intended to aid the rapid distribution of research findings and information; it was started in 1968 by Gilbert White, Robert Kates, and Ian Burton with National Science Foundation funds but is now self-supporting.

Publication in the Natural Hazards Working Paper Series is open to all hazards researchers wishing quick dissemination of their work and does not preclude more formal publication. Indeed, reader response to a publication in this series can be used to improve papers for submission to journal or book publishers.

Orders for copies of these papers and correspondence regarding the series should be directed to the Natural Hazards Center at the address below. A standing subscription to the Working Paper series is available. The cost is \$3.00 per copy on a subscription basis, or \$4.50 per copy when ordered singly. Copies sent beyond North America cost an additional \$1.00.

The Natural Hazards Research and Applications
Information Center
Institute of Behavioral Science #6
Campus Box 482
University of Colorado
Boulder, Colorado 80309-0482

TABLE OF CONTENTS

Introduction	1
Research Method	2
Comparison of the Two Communities	3
Comparison of the Two Disasters	5
The Psychology of Disaster Victims	7
Literature Review	7
Phase One: Altruism	10
Phase Two: Denial	16
Phase Three: Anger	25
Phase Four: Final Recovery	34
Conclusions and Recommendations	37
References	40

INTRODUCTION

In the short time between September 22, 1989, and October 17, 1989, two of the costliest natural disasters in the history of the United States occurred. By spending time in the shelters of two small communities, one in each disaster, it was possible to interview many victims and relief workers. This information was added to archival data collected from each disaster. Then, people's reactions to the two disasters were compared, and the effect of the community's history and politics on people's reactions was determined.

The information revealed a phased response on the part of victims and relief workers. During the first phase, both the victims and volunteers showed altruism. However, further exploration revealed that altruism served an important psychological function: by helping others, the victims coped with the sense of being unjustifiably hurt.

In the second phase, both victims and relief workers reorganized their thinking about the events, mostly by denying the magnitude of the disaster so they could accept its effects more easily. This presented a variety of problems. In families, parents and children inadvertently colluded to ignore their pain. In schools, counseling of students by teachers ended prematurely. In shelters and relief agencies, relief workers who wanted to help victims could not, because victims denied their pain.

Both victims and volunteers became angry in the third phase of recovery. Victims were angry for being victimized and unjustly treated by God. These emotions increased when they encountered the rules and regulations of the agencies trying to help them. The victims took out their anger at relief workers, and the relief personnel responded by becoming depressed (burned out) or angry at having their good will rebuffed.

A fourth phase—final resolution—is only briefly described because there was not enough time in the field to gather further information.

The interactions between the victims and the relief workers in the first three phases illustrate how the psychological needs of one group contributed to the difficulties of the other group. Although there were differences between the reactions to the two disasters, this destructive interaction between the two groups was an overriding finding in this study. Several policy recommendations stem from this situation, and most of them rely upon education of relief personnel.

RESEARCH METHOD

With help from the Natural Hazards Research and Applications Information Center, it was possible to study psychological reactions to two natural disasters: Hurricane Hugo and the Loma Prieta earthquake. The American Red Cross also assisted by providing the research team access to Red Cross shelters.

The data are drawn from two small, coastal towns—Watsonville, California, and McClellanville, South Carolina—that were highly impacted by the Loma Prieta earthquake and Hurricane Hugo, respectively. Participant observations in South Carolina were made by the research team (myself and two assistants) who lived with victims in a Red Cross shelter. California's Loma Prieta mountain is a few miles from my house, so I considered myself to be a participant observer of the earthquake, a role that was reinforced by living in the emergency shelters in Watsonville.

The participant observations began within a week after Hurricane Hugo hit the South Carolina coast. Two research team members stayed in a Red Cross shelter that served many of the high-impact families. During the days following the disaster, they moved among several shelters, went to community meetings, talked with many citizens, helped families with some of their practical problems, and worked in schools with teachers, counselors, and children. Several families were given long and structured interviews. Information was gathered in this manner for a

month and was followed up by telephone interviews for several months.

The procedure in Watsonville was similar. A good deal of time was spent in official shelters, in governmental and community meetings, in ad hoc community shelters, in schools among students and teachers, and among citizens in their homes, including those in migrant camps. Structured interviews were conducted with several families. This procedure began a few days after the earthquake and continued for several months.

Archival data were collected from newspapers on both coasts, from U.S. census reports, and from other government documents. A systematic reading of the daily newspapers in the two communities was conducted for two months after each disaster. With permission from the schools, the school records of many children whose families received the structured interviews were examined. Some records from several mental health agencies, community groups, and governmental authorities were also reviewed.

Describing the differences and similarities between the two towns focused our understanding on how community, including social class and ethnicity of the residents, contributes to people's psychological reactions to natural disasters. Because each of these towns experienced a different type of disaster, the comparative approach also yielded information about how people's reactions were related to particular types of disasters.

COMPARISON OF THE TWO COMMUNITIES

Watsonville's population is approximately 30,000 and McClellanville's is about 8,000. However, their sizes as a ratio to their state's population are comparable, and the two towns are similar with respect to their proximity to a large urban area. McClellanville is about one hour's drive from Charleston, and Watsonville is about one and one-half hours from San Francisco. They are too far to be commuter towns, but are each close enough

to their respective urban centers that these cities are part of the wealthier local population's entertainment world.

The two towns have similar histories. Both began as agricultural communities based on cheap labor—slaves in the case of McClellanville and foreign migrant workers in the case of Watsonville.

Although McClellanville is no longer a farming community, it remains an agricultural center. The shrimp and tree harvesting industries are its largest sources of employment. Watsonville remains a farming community producing almost 80% of the country's frozen vegetables between May and October (Cockburn, 1989).

Both towns have similar proportions of nonwhites. More than half the adult population in Watsonville is Mexican or Mexican-American. Many people do not speak English, and some are bilingual. In McClellanville, African-Americans constitute about 80% of the population. The public schools in both towns are predominantly nonwhite.

One difference between the two communities is the extent of local political activism. In Watsonville, unlike McClellanville, political activism has been substantial. Three events in the last two years have been particularly important to the development of Watsonville's political consciousness. First, an 18-month cannery strike involved many dramatic events, including a mile-long march by strikers on their knees to the local cathedral. Almost all participants were Mexican and Mexican-American women. A second incident happened a year before the earthquake when Mexican-Americans protested against the at-large city council system of elections, which they claimed was biased against them. When they did not receive an adequate reply, they filed a suit, which the U.S. Supreme Court eventually decided in their favor. The third event, almost immediately after the earthquake, involved a tent shelter. It was neither sanctioned by the relief agencies or by the city government and was established in the center of town at Calahan Park. It was purposely set up to protest the pre--

earthquake affordable housing shortage and accomplished this goal because of extensive media coverage. These events created a sense of solidarity and political power among the non-Anglo community.

In contrast, the nonwhite majority in McClellanville was not politically well organized. Two years prior to the hurricane a private school, the Rutledge Academy, was formed by the white families to keep their children from attending integrated schools. This effort was never countered by the African-American community. In addition, there was no sustained organized effort to press the government for more services after the hurricane. Instead, a group of white volunteers from a church in upstate South Carolina came into the African-American section of McClellanville that was hit hardest by the storm. As one of them said, "We came in order to help them [the African-American victims] help themselves."

COMPARISON OF THE TWO DISASTERS

It is valuable to compare the impact of the two disasters because victims' emotional reactions are associated with the extent of the disaster impact (Silber et al., 1958; Newman, 1976; Beigel and Berren, 1985; Horowitz, 1990; Raphael, 1986). According to Green's (1982) criteria, the disasters were central to each community. Neither of the disasters were isolated traumas.

The disasters were the two costliest natural disasters in U.S. history. Hugo's damages were estimated at more than \$5 billion (Federal Emergency Management Agency, 1990). In South Carolina alone, Hurricane Hugo affected an estimated 1.8 million people, 264,500 people were evacuated from their homes, 270,000 people became temporarily unemployed, and 60,000 were left homeless (Federal Emergency Management Agency, 1990). The September 9, 1990, Charleston News and Courier reported that insurance companies lost \$2.678 billion on Hugo.

The Loma Prieta earthquake on the west coast probably caused more than \$6 billion in damage (Dames and Moore, 1989; Plafker

and Galloway, 1990; Ward and Page, 1990). The earthquake was felt over a 400,000 square mile area (Plafker and Galloway, 1990), and more than 100,000 houses were damaged (Dames and Moore, 1989).

Each disaster also had catastrophic events. In McClellanville, during the night of September 22, 1989, more than 1,000 people were inadvertently locked in Lincoln High School. Without light, they felt the tide water rising from their knees to their shoulders, and they came within inches of drowning before the water peaked. In Watsonville, buildings collapsed in front of citizens, causing so much fear that many people preferred to live in tents for weeks rather than return to their homes. These catastrophic events contributed to wide-spread feelings of vulnerability to powerful events outside of one's control and beyond experience.

Despite the similarity of the impacts on both communities, there was an important difference between the two disasters. The hurricane was preceded by advanced warnings and the threat lasted only hours. The earthquake, on the other hand, surprised residents and caused aftershocks during the next several weeks, making its ending as uncertain as its beginning. Whereas people in McClellanville were sure the storm was over, fears of continued tremors in Watsonville were reinforced by the media, which quoted geologists in a way that suggested a bigger earthquake might be imminent (Smith, 1989).

Another difference affecting the psychological state of the local populations was the prior disaster experience of the two communities. Many of Watsonville's victims had been in the Mexico City earthquake or had relatives who were. They remembered that an aftershock 48 hours after the main earthquake had contributed to the high death toll. Many of the victims in McClellanville had experienced previous hurricanes (the worst was Hurricane Hazel in 1954), but none of these were as scary, destructive, or deadly as the Mexico City event.

Houses were destroyed or damaged in both disasters, but the psychological impact of the destruction was quite different. When houses in McClellanville were damaged but not destroyed, people went back into their homes and stayed there until the water and mud were cleared, the sewage cleaned, and the debris carried off. Their houses were safe to enter. In contrast, many of the houses damaged in the earthquake did not look unsafe, but were deemed unsafe by a governmental authority. Residents were not allowed to re-enter, and in many cases, people were given only 15 minutes to remove all their belongings.

The two disasters allowed analysis of variables centering around the nature and impact of disasters. All of these variables suggested that the earthquake would cause more psychological disturbance. First, the earthquake came without any forewarning, while the hurricane advanced under close watch. Second, because it had come and gone, the storm gone was considerably easier to accept than the seemingly neverending earthquake. The very negative disaster experience of Mexico City predisposed the people of Watsonville to expect something truly awful, whereas the people of McClellanville had lived through many benign hurricane warnings (even Hazel was not as bad as Hugo). Third, earthquake victims were forced to obey what they perceived as an arbitrary form of governmental intervention when they were not allowed to enter their houses or were given only 15 minutes to remove their personal belongings.

THE PSYCHOLOGY OF DISASTER VICTIMS

Literature Review

From the first studies following the Boston Coconut Grove fire 45 years ago, a good deal of literature has accumulated about the psychological effects of disasters on victims (Lindemann, 1944; Cobb and Lindemann, 1943). However, not all of the subsequent research is in agreement. For example, a large body of research suggests that mental health after a disaster is

altered for at least two years (Erikson, 1976a, 1976b; Lifton and Olsen, 1976; Newman, 1976; Titchener and Kapp, 1976; Rangell, 1976; Terr, 1981a, 1981b; Gleser, Green, and Winget, 1981; Green and Gleser, 1983; Green, Grace, and Gleeser, 1985; Terr, 1985; Murphy, 1986, 1987). Other findings have taken the opposite view, namely that disasters do not, after a short period of time, change a person's mental state (Erickson et al., 1976; Quarantelli and Dynes, 1977; Baisdan and Quarantelli, 1981; Powell and Penick, 1983; Fairly, Langeluddecke, and Tennant, 1986). Several reviews illustrate the reasons for these differences or demonstrate that they do not truly exist (Green, 1986; Warheit, 1986; Shore, 1986; Breslau and Davis, 1987).

Similarly, there are contradictory findings concerning the question of whether or not disasters produce new mental disorders. Some authors suggest that new disorders rarely occur (Robbins et al., 1986; Smith, 1986), while others suggest there are new disorders (Canino et al., 1990; McFarlane, 1986). The new disorders most frequently mentioned are depression, post traumatic stress disorder symptoms, anxiety, and somatization (Gleser, Green, and Winget, 1981; Lima et al., 1988; Shore, Tatum, and Vollmer, 1986; Bromet and Dunn, 1981). There has been some confusion over the question of increased alcohol and drug abuse after a disaster. Observations from many disasters, including those of de la Fuente (1990), concerning the Mexico City earthquake, suggest an increase, while neither Canino et al. (1990) nor Robins et al. (1986) found that alcoholism increased as a result of being exposed to disasters.

Another question concerns how people respond to different types of disasters. Among different natural disasters, emotional reactions are described as being worse when the disaster has a quick onset, such as with earthquakes, rather than a slow onset, such as with hurricanes. (Bravo et al., 1990). Frederick (1980) and Berren, Beigel, and Ghertner (1980) suggest there are differ-

ences between people's emotional reactions to natural versus technological disasters, with the latter being more problematic.

On the other hand, Kohn and Levav (1990, p. 72) say that "one cannot determine from the literature if man-made versus natural disasters have a different outcome in terms of bereavement." Horowitz (1990) suggests that reactions to any kind of unusual stress—for example, war, rape, or natural disasters—are similar. Lima et al. (1990, p. 12) also conclude that "emotional distress are [sic] similar for victims of different disasters."

Another important variable the victim's age. It has been suggested that children, mothers of young children, and the elderly are the most vulnerable (Edwards, 1976; Raphael, 1986; Houts, Cleary, and Hu, 1988; Bromet, 1989). Aptekar and Boore (1990) reviewed the literature concerning children's emotional problems following a disaster and suggest that variables such as separation from family, community support, and the child's resiliency contribute to how children respond to disasters.

There are also issues concerning culture and ethnicity. Following a disaster, human and property losses have been shown to be more pervasive in lower socioeconomic groups (Guha-Sapir and Lechat, 1986). Some research suggests that disaster recovery brings to the surface a community's predisaster social issues (Quarantelli, 1986). For example, after the Mexico City earthquake, one researcher observed that the "latent situations of social conflict tended to intensify and become externalized" (de la Fuente, 1990, p. 28).

Research describing stress in communities after a disaster is also inconclusive. Some suggests there is increased violence throughout the entire community (Seigler-Shelton and Marks, 1980). In addition, the manner in which disaster relief is perceived by the public, whether it is seen as outside interference or sensitive to local cultural values, affects community's responses (Lindy and Grace, 1986).

The literature seems consistent in saying that people with poor mental health and people without social support do the poorest after disasters (Lindy and Grace, 1986; Cohen and Syme, 1985). As Horowitz (1990, p. 21) states, "The psychologically rich get richer: healthy people tend to be resilient in their responses to stressor events." He suggests that emotionally healthy people who are victimized by natural disasters experience a phased response beginning with fear and anxiety, followed by denial and anger, and ending with recovery and continuance of their lives.

This paper modifies and adds to the existing literature by describing three aspects of the phased recovery process—altruism, denial, and anger—in more detail. A fourth phase, final recovery, is also mentioned only briefly because insufficient data was collected to describe it completely. This information is put in postdisaster chronological order and in the contexts of the two types of natural disasters and the two communities studied. By using this format, it is possible to discuss the interaction between the psychological states of relief workers and the emotional reactions of those they help.

Phase One: Altruism

Victims in both disasters were anxious and mentally disoriented immediately following the disasters. One McClellanville man, whose yard was covered with fallen branches, a 100-year-old uprooted oak tree, six inches of sea mud, dead fish, and an assortment of other debris, started to pick up soda cans as he walked back and forth across his lawn. He picked up one can, carried it across the lawn, and dropped it into a 50-gallon garbage pail before resuming the sequence. His efforts helped him regain a sense of mastery over a world that abruptly lost its predictability.

In spite of the mental confusion which characterized the hurricane victims, there was an air of celebration that at least the disaster was over. This was not the case after the earthquake

because aftershocks prevented any sense of relief. Guarding against the possible and unpredictable aftershocks, victims remained in a state of hypervigilance, further affecting their concentration and perpetuating their confusion.

Within hours after the disasters many victims were offering to help other victims. By immediately volunteering, these people may have found one of the few ways they could act altruistically. Nevertheless, altruism must be understood in light of the psychological need that prompts it and the service to the psyche that it offers.

The need to re-establish a sense of goodness immediately following the unexplainable indifference of nature motivated victims to volunteer and thus demonstrate they were good, caring people. This reasoning is complex because the victims wanted to demonstrate these values to others and to their private psyches in order to ease their outrage at the injustice they had suffered.

Volunteering made people feel better about themselves. Ida Mess,¹ a victim-volunteer, grew up near the tidewater marshes on the South Carolina coast. She remembered when Hurricane Hazel destroyed her neighbor's house, but did not damage hers. She felt "saved from God's will." This time she was not so lucky. The house she and her husband had built with their meager retirement money was almost entirely demolished. They lived in a neighborhood with many of their lifelong friends whose houses were also severely damaged. Rather than cleaning the mud from their own house, Ida and her husband went to help their neighbors. By keeping busy with the problems of other victims, they were able to avoid their own. By working to save the community in which they lived, they helped reduce the possibility that their community would become annihilated.

¹All names have been changed

During the earthquake, Susie Redface's 5-year-old daughter was at a dance class in a building that collapsed during that disaster. Her daughter witnessed a pedestrian's death when bricks from the building fell on his head. Susie could not cross a damaged bridge that was closed to traffic, so she was not able to pick up her daughter. Susie started helping her neighbors while waiting for her daughter. "What kept me sane during the several hours it took for me to be reunited with my daughter was my being able to comfort my neighbors. At least I could help somebody. I just didn't want to be alone and not help. I knew someone would help me. I prayed they were helping Rita [her daughter]." As long as Suzie could help, she could imagine she was not as bad off as those she was helping.

The breadth and depth of the altruism displayed (almost everyone in both disasters demonstrated some) made the phenomenon appear religious in nature—as if by doing something for someone else, atonement for having been afflicted was more likely or the possibility of receiving compensation more possible. Indeed, when people like Ida and Susie were asked about volunteering so soon after the disaster, they often used the language of religion: "This is God's plan;" "God would want it this way;" "It is my moral duty;" "The ten commandments tell me to help my neighbor;" etc.

However, because victim-volunteers could not put aside their feelings of being victims, their effectiveness was reduced. While they were helping others, they also had to consider their own distressed children or parents, damaged houses, and fears. They became ambivalent about where to put their energies.

Within the first few days after each of the disasters, two volunteer groups that were not victimized by the disasters, came into the communities. One group was composed of professionals from relief organizations; the second was affiliated with existing community organizations—mostly local churches and organizations such as the Rotary and the Lions clubs.

The motivations of the volunteers who came from pre-existing community organizations were quite different from those of the victim-volunteers. They came with the desire to help, but they were also there representing the institution that recruited them. Several motives beyond altruism prompted the organizations to send volunteers, including receiving positive publicity, encouraging commitment to the organization, and providing a social/religious experience for members. None of these reasons necessarily ruined the volunteers' effectiveness, but unlike the victim-volunteers, these ad hoc community volunteers remained one step removed from the victims.

The Southern Baptist Convention, a loosely knit federation of Baptist churches, sent a mobile kitchen staffed by volunteers who prepared as many as 3,000 meals a day in McClellanville. Their work reflected positively on the Baptist Church and provided a morally worthwhile social experience for the participants. Their motivation to help was closely tied to these factors, and they provided a needed service. However, beyond serving meals for a preordained amount of time, they did not become involved in victims' lives.

When the first wave of professional volunteers arrived, victim-volunteers were already working. The victim-volunteers had started carrying the fire hoses, digging victims out of the debris, and hauling water and food to those in need. Even if the victim-volunteers had some Red Cross training, the professional volunteers, who work efficiently from knowledge, considered them to be amateur disaster relief workers who were operating more from passion than expertise.

Most of the local victim-volunteers were not trained for disaster work and did not receive remuneration for their efforts. They saw themselves as "pure" volunteers, motivated only by good will. They resented the newly arrived "professional" volunteers who held a higher status in the shelters and who they considered to be less altruistic and less caring because they were getting

paid. This tension was aggravated by the feeling of insiders versus outsiders, not only in terms of the professionals who lived outside the affected community and the victim-volunteers who lived within it, but also in the sense of having or not having personally experienced the disaster.

In the long hours of work with little rest and the ever present sense of crisis, these issues created tensions that often centered around how much and to whom help should be directed. Each decision made by the shelter administration often personally affected local volunteers. The latter group knew the victims and were aware of the effects the decisions would have on their neighbors' lives.

If there was one irreversible mistake that the professional volunteers made when they came into each of the affected communities, particularly Watsonville where the community already had a strong, politically active, minority citizenry, it was telling the victim-volunteers to go home. It was a mistake for three reasons. First, the professionals needed all the help they could get; second, it ignored the psychological value of volunteering for victim-volunteers; and third, it dampened the altruistic spirit that followed the disaster and placed a pall over the community.

Yet, it was understandable that the professional relief workers chose to work with the ad hoc community volunteers rather than the victim volunteers. There was a need for volunteer help, and the ad hoc community relief groups, such as the Southern Baptist Convention in South Carolina, were more easily incorporated into the organized relief structure than the victim-volunteers. The ad-hoc groups came from pre-existing community organizations, and as recognized entities, they were easier to negotiate with. They did not suffer the emotion and stress associated with the disaster impact because they had not been victimized. In fact, their efficient help contrasted with the

highly charged, and sometimes misdirected, help of the victim-volunteers.

However, as time progressed, the victims' problems began to bear more heavily on the relief community. The ad hoc 'community volunteers had agreed only to a limited duty, both in terms of time and emotional commitment. When they thought their commitment was fulfilled, they were ready to go home. The professionals faced a staff shortage and were unable to turn to the victim-volunteers who were quite angry because they had been dismissed earlier. By the end of the first phase, tensions emerged between professional volunteers and the victim-volunteers.

There is much to be said for the value of first impressions, particularly in times when people are confused, anxious, and reactionary (like the man in McClellanville walking back and forth across his debris-laden lawn). It was during this first phase that victims and volunteers, the insiders and the outsiders, first met. Victims were reduced psychologically, physically, and materially by the disaster and needed to reassert their sense of identity. Again, they often did this by voluntarily helping other victims. Nothing feels more heroic than assisting someone who desperately needs what you have to offer, particularly if you are suffering yourself. Thus, a tremendous mistake was made, one from which the relief agencies were never fully able to recover, when these victim-volunteers were summarily dismissed by the "outside experts."

The single most important policy recommendation stemming from phase one of the recovery would be to teach relief personnel that a less than efficient approach in the first few days following a disaster might lead to a far more effective relief effort in the long run. If relief personnel could be more accommodating to victim-volunteers initially, then victims, as recovery progresses, might be more accepting of the organized relief efforts.

Phase Two: Denial

Much of the cognitive confusion subsided within the first week after the hurricane, and within two to three weeks after the earthquake. The altruism also faded. Residents began looking for explanations of why they were victimized. Some people used "magical" thinking to explain the disaster, and gave it the status of a divine act: "God punished us;" "God saved us;" or "It was part of God's plan." As Jim Colt of McClellanville said, "Thirty minutes and it destroys your whole life. Who knows why, but it was God's will."

People also reorganized the way they thought about the disaster. They distorted the memory of the disaster, forgot parts of what happened, and most importantly, denied the magnitude of the disaster's impact and their reactions to it. One explanation of the denial and memory changes is to see them as a way for the psyche to master the experience (Freud, 1920; Schur, 1966). Similarly, they may be seen as coping devices that help to distance oneself from the event (Goffman, 1971).

Jessica Bright lives near McClellanville. During the hurricane, the roof of her house was blown off and the interior was destroyed by rain. In addition, her 10-month-old-baby had died a month before the storm. Three weeks after the storm, the insurance adjuster had still not visited her house. When asked how she was handling the tardiness of the insurance claim, she said, "I don't really mind. A lot of people are worse off than me."

The denial affected both victims and volunteers, and it had important implications for researchers and practitioners. Research shows that denial is effective in helping people cope with overwhelming events (Caplan, 1981; Horowitz, 1976). In these disasters, however, it also caused difficult problems.

Parents who denied their problems had difficulty seeing their children's dysfunction. Other disaster studies confirm this and note that parents tend to minimize or deny their children's problems (Terr, 1981a; Sack et al., 1986; Kinzie et al., 1986;

Burke et al., 1982). The same was true for teachers, who had the added burden of dealing with the children at school in addition to their own children and damaged property. In each case, they, the parents and their children or the teachers and their students, played upon each other's denial. For example, children sensed their parents were bereft and thus were afraid to show their own fears and denied having them. These children knew their parents were upset and felt they must exhibit good behavior. This attitude did not develop out of a sense of altruism. The children reasoned that if they caused problems at home or at school, the shattered threads of normalcy left in their homes might be totally destroyed. This was too frightening for them, so they tried to act as if nothing had happened or as if what happened was now under control so there was no reason to worry about it.

Other family dynamics also changed. For example, some parents did not know how to respond to the circumstances and were unsure of how to discipline their children. One 40-year-old Mexican-American man in Watsonville asked his 11-year-old son to pick up some of the fallen tree branches in their yard. The father did not know how to respond when his son said, "I don't want to pick up any more limbs." The father was not sure if he should demand that his boy help out during the stressful time or make special allowances for him. Such scenes happened countless times after both disasters. These situations were not easily resolved mainly because many parents were unaware of their own disaster fears. One study (Titchener and Kapp, 1976) notes that adult disaster victims re-experienced childhood anxieties rather than directly responding to the current stressor. These powerful emotions reduced parental tensions and helped their children deny the event.

Given these types of emotional difficulties, it was difficult to determine if children were not having problems (the parents and teachers point of view) or if the children had more problems than the teachers and parents reported. The literature

(Benedek, 1985) suggests that parents and clinicians can be overwhelmed, leading to a minimization of victims' problems and inadvertently helping victims avoid talking. Therefore, we concluded that parents and teachers were reducing, for their own mental health, the dimensions of the problem by denying its magnitude. However, the interaction between denial and mental health reporting needs further exploration.

Another problem denial created was that it caused symptoms to be manifested in strange ways, making it difficult to ascertain who was having problems and how severe they were. The literature points out that symptoms often come months, if not years, after the disaster and often appear in somatic forms (McFarlane, 1986; 1990). Indeed, we found a strange set of symptoms. The pathway between the disaster and the distress symptoms appeared very diverse and rarely straightforward. This was particularly true for prepubescent (preoperational) children who manifested their emotions by crying about lost or broken toys, but rarely through any symptom obviously related to the disaster. Thus, although it appeared that victims were functioning adequately, when something, often a seemingly random event, pierced this protective shell, the extent of the emotional distress became apparent, particularly if one was aware of how unusual the manifestation of symptoms could be.

One school counselor knew a fourth-grade boy in McClellanville who was timid and had few friends. Three weeks after the hurricane the boy went to the counselor's office complaining about a toothache that he had seen a dentist for prior to the hurricane. He told the counselor that his tooth ached. When he was asked about the hurricane he said he was doing fine because he had not lost his house and had not been separated from his family. Without understanding postdisaster denial, it would have been easy to send this boy back to the dentist. The counselor, though, asked him to describe what happened to him during and immediately after the hurricane. The boy burst into

tears and talked about how, during the storm, he had seen his mother cry for the first time.

Denial also made it hard for the volunteers. Their aid was often rejected by the victims. If victims accepted help, they also had to accept they needed it. Acceptance made it difficult for those who used denial to continue their evasive, yet functional, psychological response. Therefore, rejecting help was in the psychological interest of the victims but frustrated the volunteers, who, as we have said, had their own needs fulfilled by helping.

Administrators, teachers, and counselors at a high school near McClellanville began counseling students immediately after the hurricane. They organized their efforts and met regularly to discuss the emotional status of students. Their use of daily mental health briefings was exemplary. However, the briefings did not accomplish what they could have because school personnel were not aware of the power of the students' or their own denial. Although a good deal of information exists on immediate mental effects of disasters (Tuckman, 1973; Raphael, 1975; Cohen and Ahearn, 1980; Howard, 1980; Crabbs, 1981; Farberow and Gordon, 1981; Seroka et al., 1982; Klingman, 1987; Blom, 1986), there is little information about the more prolonged and subtle forms of reaction. Therefore, school officials did not recognize denial.

The mental health school briefing group requested help from local universities soon after the hurricane. When university volunteers arrived, they were told by a counselor that "everything is back to normal. There are more counselors than we can use." When the counselors asked what problems the children were facing, they were told the children had had problems, but things were now back to normal. The school team noted that more than a quarter of the students were absent. The university volunteers asked if the absenteeism might be related to the hurricane, but the emergency team thought it was not and found it difficult to believe that it might be.

The state mental health workers who came to Santa Cruz County immediately after the earthquake had a similar experience. By the second week after the earthquake, the state of California had sent nearly 90 volunteers from San Bernadino County to Santa Cruz County. Other counties sent 60 more volunteers to Santa Cruz County a week later. By this time, victims were in the process of denial. One Orange County mental health worker said he was "kicked out" of a Red Cross shelter because the person in charge said there was no reason to talk to people because their emotional problems were over. Another mental health volunteer was told "that people have talked as much as they need to. We don't want to continue talking with them about the quake." In fact, three weeks after the earthquake, many mental health workers in the area were unable to find people who needed their services.

An interesting phenomenon emerged. The media mentioned the great difficulties faced by the victims. Information coming from people in the schools, in community organizations, and in the shelters suggested that in the first few days after the disaster people were demonstrating the clear and commonly accepted signs of the mental stress that comes immediately following a disaster. These symptoms included mental confusion, lack of concentration, uncontrolled crying, and nightmares. For most, these symptoms disappeared quite quickly. However, school and mental health agency officials were unaware of what was to follow, namely the pervasive denial and resultant insidious, subtle symptoms that denial brings, such as those demonstrated by the McClellanville boy with the toothache.

Denial did not just affect the relationship between volunteers and the victims they wanted to serve, it also caused problems among volunteers. In fact, because of the victims' denial, the client pool diminished and there seemed to be too many mental health volunteers because they were summoned before denial had set in. So, some volunteer counselors began counseling immediately, while others waited or were placed in less direct

service jobs, where they worked with paper instead of victims. Volunteers in the more favored positions defined and defended their territory and became defensive or even argumentative when they perceived that someone might cross over into their domain. As discussed earlier, volunteerism is often based on an individual's need to help others and is related to a volunteer's self-esteem. In this case, the volunteers who could not provide direct counseling services were relatively unhappy, and some even became jealous of those who were counseling.

The tension among shelter volunteers extended to potential volunteers, and it was not long before the victims also sensed this tension. For example, after hearing that Watsonville needed bilingual volunteers, three ad hoc volunteers from San Jose filled their cars with clothes and drove the hour and a half to Watsonville. They were not affiliated with a pre-existing community agency and were involved because they were Latino, bilingual, and felt compelled and eager to help. Since they were Latino, they thought they could be a direct link among the victims, the local community, and the professional relief teams.

They went to Watsonville's Red Cross and were told that the clothing would not be accepted because Red Cross's policy is to give people money to buy their own clothes. The Red Cross believes this aids the mental health of victims because it allows them to regain control of their lives.

The San Jose volunteers were also told that they could not talk to the victims in the shelter because the victims already had talked sufficiently about the disaster. Feeling frustrated, the volunteers went to a local ad hoc relief group that was giving clothes to victims. They were told by a member of the relief group that they already had plenty of clothes. In spite of feeling humiliated because they were thwarted at giving something away for nothing, particularly after being asked to bring donations with them, they went to another relief agency—a local, nonprofit clothing and food distribution center.

This organization also told them clothes were no longer needed, but that their bilingual skills might be needed at a Red Cross shelter across town. However, when the volunteers arrived at that site, the national guard patrolling the site did not let them leave the clothes because the person in charge of taking donations was not on duty.

The volunteers went back to their car in the shelter's parking lot. Victims going to and from the shelter began talking to them, and within an hour, the clothes were distributed. These volunteers fumed about their experiences and shared their frustrations with their neighbors.

Other volunteers had similar experiences. Initially, they were full of good will. However, between the denial of the victims and the demands of the relief agencies—which laid down a series of rules that outlined the lines of communication among their staff and between staff and volunteers and defined which services would be given and who would be giving them—many volunteers felt that volunteering was less rewarding than expected.

The kinds of events the bilingual volunteers experienced, fostered antagonism in the community against the relief efforts and also encouraged another type of ad hoc volunteer, the "wildcat volunteer". Wildcat volunteers were frustrated and angry at established relief agencies. In most cases, something distasteful had happened to them after they decided to volunteer. When they felt rebuffed by a relief agency, they reacted by volunteering outside of the organized relief effort. Some of this help was not particularly disruptive; however, because they had little understanding of the overall response effort, their efforts often heightened rather than reduced postdisaster tensions.

An example of this can be taken from the November 6, 1989, San Jose Mercury News article entitled "Quake Relief Work Big and Clumsy." The article told of a man who went to a Red Cross office to volunteer his services. They were unable to offer him an immediate task. He explained to them that wherever he went he

kept receiving similar "rejections," which in his words meant that he was "passed from Red Cross to Red Cross."

Not being able to volunteer through the established channels and taking the problems associated with coordinating many volunteers as a personal rejection, the man organized his own relief effort. He created a volunteer network, received donations, and found places to distribute them. Although he gained praise and attention from friends and the local press, a careful analysis of his work revealed that he actually created relief effort problems.

The following example illustrates one type of problem encountered with "wildcat volunteering." The Second Harvest Food Bank of Santa Clara and San Mateo counties was a major part of the established emergency relief effort and had received many donations. In this case, the Second Harvest Food Bank responded to a shelter asking for several truckloads of food. They phoned donators, organized volunteers to pick up food, loaded it onto trucks, and drove the trucks to the shelter. However, when the trucks arrived, the shelter had already received food from wildcat volunteers who had independently organized a delivery of food to the same shelter without notifying other relief agencies. The shelter did not have room to store additional food and rejected the food bank's donation.

The wildcat volunteers were not part of the network of communication among relief agencies, and, as the man said in his newspaper interview, they did "not understand the need to have one." These volunteers purposely avoided communicating with established relief agencies because they had bad experiences with them. This lack of communication increased the amount of time and personnel needed to organize the established relief efforts. Comfort (1990) described a similar phenomenon after the Armenian earthquake.

Sometimes volunteers operating outside the network, even if they did not have bad intentions, caused tensions between the

victims who were staying in organized shelters and those in charge. For example, after some earthquake victims arrived at a shelter, a Mexican-American man arrived with several boxes of food. He approached three of the national guard who were patrolling the shelter and told them he had food to give. They told him that food could not be given to people in the shelter directly but must be given to a central food bank where it would be inspected and distributed. The man decided to give the food to people as they entered the shelter, but the people in the shelter already had ample food supplied for them, so they stored the wildcat volunteer's food in their tents and violated a camp rule designed to prevent public health problems.

These kinds of problems contributed to the tensions between the victims and the camp authorities, who had to enforce the rules. Thus, the victims in the camp, who were complaining that they felt like they were living in a military base, were forced to accept additional orders. This wildcat volunteer, like many others who did not understand the importance of the camp's rules and regulations, inadvertently heightened these tensions.

Yet, it was easy to see how frustrating the rules could be. After Hurricane Hugo, one African-American man took food from his kitchen, walked it to a shelter near his house, and wanted to give it to the very people he often shared food with at his dining room table. When he discovered that he could not give them food directly, that he would have to drive across town and drop it off at a centralized bureaucratic center where it would be mixed with other donated food, inspected, sorted, and sent to various official shelters (of which the shelter his friends were in was only one), he became frustrated and angry. Like most citizens he had thought about the health requirements of having large numbers of people living closely together for long periods of time. He, like many of the wildcat volunteers, acted impulsively in response to the difficulties of working with an organized relief effort.

In phase two, we came to understand that to be fair in analyzing the problems associated with the relief effort, it was necessary to see how each side viewed the situation. The victims needed to deny the predicament they were in, and the ad hoc volunteers needed to have victims in order to be helpful. As a result, there appeared to be an excess of volunteers that caused the relief agencies, already somewhat at odds with the local community, to become more rigid in their rules. This alienated many ad hoc volunteers, who in turn spread word throughout their neighborhoods about the insensitivity of the relief agencies.

Clearly, prior planning can ameliorate such situations. Plans should be developed with provisions that allow community members to volunteer, and should outline what relief agencies can expect, what they should accept, and how they should reject disruptive volunteers. These plans should include relief personnel training so they can learn that there is more to the emotional problems of victims than the initial signs associated with post-traumatic stress. Relief workers need to learn about and be aware of denial and its effects on volunteers and become sensitive to the strong emotional needs of the people who volunteer.

Phase Three: Anger

Three weeks after the hurricane and a month or more after the earthquake, victims had passed through denial, and began asking "Why me?" When they could not find a satisfactory answer, they looked for an answer from the governmental and private agencies that were there to help them. Since they perceived the disasters were not their fault and that they should not be punished, they believed that relief agencies should help them recover. In fact, they reasoned they ought to be reimbursed for their material losses and for the more important loss of living in an unjust world. In other words, the victims felt entitled to more than they could possibly receive.

As denial among victims waned, anxiety emerged, and much of it was converted to anger toward the people who were there to

help them. The victims' thoughts continually dwelled on the relief agencies' excess rules and regulations, their insensitivity to the victims and their families, how they were prejudice against ethnic groups, and other such problems. Many of these feelings and allegations were repeated in the press.

These reactions of anger were like the emotions of seriously ill patients when they must take long and difficult treatments for the possibility, not even the probability, of returning to their healthy life. It was difficult to ascertain, just as it is for seriously ill patients who complain about the quality of medical care, if the victims' complaints were legitimate or if they were a means of diverting the pain and pressure of being a victim.

It was also difficult, particularly when we looked at the volunteers or the victims, to see where the problems originated and resided. It was clear in both disasters that after a month had passed, there was considerable tension between victims and those who were there to serve them. We came to understand that as one group acted to protect its own psychological well being, it often reduced the well being of the other.

Bob Blayton was the ninth of 10 children. His father was never home, his mother had little time for him, and he had to wait behind all his siblings before he could eat, use their only toilet, or watch the television programs he liked. Bob now lives in McClellanville, is married, has three boys, and works as a carpenter. His house, which he built on the salt marshes less than a mile from the Atlantic, was destroyed in the hurricane. Being neither religious nor a believer in fate and in spite of talking with his family and friends, he could not find an answer to why his house was destroyed.

When he entered the Federal Emergency Management Agency's (FEMA's) Disaster Applications Center, he received a number instead of being personally greeted. He waited 30 minutes, filled out an application, and then saw a map reader who determined if

his property fell within a designated area. There was only one map reader for the 104 people who filled out applications that day, so he spent several hours waiting to see if his property was within the "governmental limits" in spite of the fact that his house was nearly destroyed. After the map reader confirmed that his property was within the proper boundary, he waited for the one small-business loan representative who could also grant or refuse a loan to replace his carpentry tools that were also destroyed in the storm.

At each step, Bob filled out government forms without much help and was never sure if he was even eligible for aid. This uncertainty increased his sense of helplessness. He was also very cautious because he could not understand the complex set of rules and regulations so important to his welfare. In addition, he was not in the best of mental health since he had just been through the hurricane and lost his house. All of these factors—his low energy, the stress, the long wait at the FEMA office where he was met with rules and regulations beyond his comprehension, and the unconscious re-enactment of his childhood frustrations—led to an excessive accumulation of stressors.

The next day, he visited his private insurance agent whose company had reserved several motel rooms in a resort town about 45 minutes away. His car was also damaged so it was difficult for him to get there. He eventually rode, with some other friends, in the back of a friend's truck. While he waited in the air conditioned motel lobby he felt confident that, as all the advertisements said, he would be able to get a quick advance and at least make his family comfortable. By this time his two youngest boys, ages six and eight, had started getting colds. Two hours later, he was taken to a room, given several long forms, and told that his insurance covered part, but not all, of the damage. He could either sign a short form now and receive a check for about \$4,500 in a week, or take home all the forms and wait to see how much of his damage was covered. Too afraid to sign the short forms, he

took the longer forms home where he found his wife had gotten clothes from a shelter.

The following day, Bob picked up food, checked on his FEMA application, and talked with his friends about the insurance forms. He learned that almost no one fared any better than he had. At about this time, he started drinking and expressed his anger with his friends, against God who brought the disaster, against the government who refused to treat him decently (let alone give him what he was due), against the insurance companies that refused to honor his premiums, and finally, against himself for being reduced, for the first time, to being a welfare recipient.

The anger victims like Bob experienced made it very difficult to determine the accuracy of interactions with relief agencies. As victims, the people often could not see their own part in the dehumanizing process. They arrived at the FEMA office or relief shelters with their own emotional tensions. Much of their frustration was taken out on, and returned by, the people at those offices and shelters.

Several researchers have found that victims, in their anger and in their inability to resolve their losses, rigidly focus their attention and thoughts on the dysfunction of the helping agencies (Leonard, 1983; Frederick, 1980; de la Fuente, 1990; Kohn and Levav, 1990; Cohen and Ahearn, 1980). On one hand, victims express anger about being refused aid that would replace what they once had and deserved to have again. On the other hand, the relief personnel experience "burnout".

The professional relief workers became frustrated when the victims' denial made it impossible for them to help as much as they would have liked. They became even more perturbed when, in the third phase, they met victims who were actually hostile to them. The relief workers either took out their frustrations on the victims or became depressed and experienced burnout, which was often no more than internalized frustration.

This was not the type of burnout usually associated with volunteer stress (Mitchell, 1988) and similar to post traumatic stress disorder. For the most part volunteers in these two disasters, which were disasters of material destruction without large numbers of fatalities, did not experience the type of stimuli that would be considered sufficiently extreme to cause post traumatic stress disorder. This volunteer burnout was not caused by the awful events of the disaster, but by interactions with victims. Every day, volunteers heard the victims' stories of property and personal belongings losses. More importantly, they received the victims' anger.

The relief agencies also contributed to the tension. Relief workers who were attacked despite their good intentions often attacked the attackers and asserted their strength through rigid and often arbitrary power. The relief agencies' power to exert their will in a crisis and the necessity of victims to accept this will was most apparent in the "15-minute rule" imposed after the earthquake.

Peter Gurgle operated an office supply store in a Watsonville shopping center for 16 years. The buildings in the shopping center were badly damaged in the earthquake and were scheduled for demolition. The store owners were given 15 minutes to remove their business stock from the building. Mr. Gurgle received a call at 10:30 p.m. Friday, and was told would be given 15 minutes on Saturday to recoup his business stock. He got a U-Haul truck and five friends to help him. When they arrived an engineer was standing by with a stop watch.

The six of them, acting like they were grocery store prize winners given a certain amount of time to fill their grocery baskets, rushed into the store and went to work filling boxes with merchandise. Mr. Gurgle's stress was increased by the fact that, in addition to the \$100,000 of stock he faced losing in his store, he had already suffered an equal loss to his house. He found it difficult to understand why he could not take an hour to

remove his merchandise. "What's so magic about 15 minutes?" he kept asking.

Frank Story, the engineer who condemned the buildings, answered, "At first I was going to allow only 10 minutes, but then I thought that people might rush too much and hurt themselves. On the other hand, if I had allowed a half-hour, they would start bringing out items that were unimportant and easily replaced" (Trabing, 1989).

Since other business people also faced the same 15-minute rule, they helped Gurgle. About 15 men and women spontaneously formed a human chain and were able to rescue \$40,000 of the \$100,000 of merchandise. When his 15 minutes were up, Mr. Gurgle and his impromptu helpers watched the crane's large ball destroy the rest of his assets. This human chain became a statement about the relationship between the community and the victims, a line drawn between "us" and "them."

Tensions were not just created by state bureaucracy (the 15-minute rule) or agency bureaucracy (FEMA's need to process an inordinate amount of claims). Nor should agencies' bureaucratic mistakes be judged in isolation. As we have seen, tensions were created by victims like Bob Blayton, who were victimized and forced, in many respects, to resolve their problems through anger at the relief agencies. Tensions were also heightened by volunteers (often the wildcat volunteers) who were at the shelters more to work out their own agendas than to aid victims. This phenomenon is not unique to these disasters. Lechat (1990, p. 72) points out that much outside relief focuses "more on politics and prestige than on efficient and effective results."

Jorge Luiz, a middle-aged man in charge of a Chicano youth group in Oakland and a political leader of a state Chicano community organization, came to Watsonville believing, based on information released during the first month of disaster relief, that the Red Cross was insensitive to the needs of Mexican-

Americans. When he arrived, he looked for evidence and made pronouncements to anyone who would listen.

Outside of one shelter, Jorge Luiz saw a small trailer with a sign that read "Hogar" (home). The trailer was an office for an ad hoc Chicano organization of the same name that was set up to help Spanish-speaking people deal with problems associated with living in a shelter. Outside of the Hogar, three disgruntled Mexican-American men were complaining about the Red Cross. Jorge joined the discussion.

The men were telling the Hogar director that they were dissatisfied with the Red Cross rent vouchers. They tried to give the vouchers to a potential landlord who told them the vouchers were not valid and he would only rent them an apartment when he received cash. The three men also complained about the food and said they were given only bread and milk for breakfast. In fact, this might have been true on one occasion when organizational problems hampered food delivery. In general, the food provided by the Red Cross was ample, varied, and nutritious. It was not, however, always the same food that Mexicans-Americans normally eat.

In addition, the three men complained more generally about the disaster relief effort. They said they heard there was a lot of money given to victims, but they never received any of it (they were referring to a large cash gift by Mick Jagger, who had visited the camp, and to an anonymous donor who gave the Red Cross \$1,000 for each tent at the shelter). Jorge was sure the complaints substantiated his view. He contacted the Red Cross representative, a staff member from a regional office, at the nearby shelter and demanded that he directly address the men's complaints.

The Red Cross official, tired from having worked several days without much sleep and feeling attacked by Jorge Luiz, asked him to bring the men to his office where he had the information to respond. Jorge Luiz told him that he should meet the men at

the Hogar trailer because "Mexicans will feel better if they think that people care about them."

The Red Cross official went to the Hogar trailer and explained that when money is given to Red Cross it goes to the organization, not to individuals or to particular places. (This policy got the Red Cross into considerable trouble in San Francisco where people gave the Red Cross money specifically for earthquake relief. At first, the Red Cross refused to use the money in this fashion but changed their position after coming under political pressure.) The Red Cross official said that the Red Cross "uses money to defray the costs of their services and not solely to meet the needs of a particular disaster." He also explained that rent vouchers are given to victims instead of money because Red Cross's procedure is to have the victims bring the voucher, signed by the landlord, to the Red Cross shelter where the victims can receive cash. He explained that he could not control a landlord's decision, but he offered to call the landlord who refused to rent to these victims and explain Red Cross procedure. The victims gave the Red Cross official the telephone number and he called the landlord on their behalf.

The Red Cross official returned to his office, and Jorge Luiz told the victims that their rights were being violated because they were Chicanos. He encouraged the men to see the problems in terms of ethnic prejudice, rather than bureaucratic inflexibility, or more honestly, as two sides with difficult situations to face. He flamed the wrong fire and did little to get housing for the three men. Before returning to Oakland, Jorge Luiz gave the three men his business card and promised to help them further should they need it.

This exchange illustrates the difficulty of getting accurate information either from victims or from relief personnel without taking both points of view into account. By the third phase following these disasters, one side was demanding to be taken care of and the other side was feeling that they were giving too

much. It was difficult, in this highly charged atmosphere, to know who was responsible for the problems, because they stemmed from the victims, the volunteers, and the professional relief agencies, and were fueled by the interactions among the three.

Phase three reactions lasted a long time, partly because of the prolonged time involved in settling disputes with private or public agencies (as of this writing, more than a year after the disasters, many disputes on both coasts, particularly those that involve the poor, are still going on). In addition, victims differed in their degree of readiness to put the disaster behind them.

The responses of frustration and anger were present to some extent in nearly all the victims in both disasters. Some did not manage their frustrations and control their anger as well as others. Who accepts unexpected and undeserved loss without becoming angry or depressed? Those who had an easier time were people with plenty of family and community support, people who could call on a higher cause (such as religion or a devotion to work), and people with little prior anger or depression. It was apparent that people who had problems with authority or who had difficulty coping with change and stress were more affected.

This suggests that victims with the best predisaster mental health coped better and suffered less. Indeed, McFarlane (1990) and others found that the strongest predictor of mental illness after a disaster was the predisaster level of functioning. It is not difficult to learn how to take a psychological history, to assess past levels of psychological functioning, and to ascertain current mental status. This kind of training has been given to relief agency personnel with good results and should be continued (Lima et al., 1990).

Social class and ethnic factors also contributed to the degree to which victims became angry. Among the nonwhite poor in both disaster communities the status of victim with its concomitant need to ask permission to receive help recalled prior

adverse experiences dealing with government agencies or seeking community assistance. Many African-American victims in the small community of McClellanville recalled their grandparents' stories of being slaves, of being helpless and dependent on their white plantation masters. Mexican-Americans in Watsonville remembered their families' stories of being deprived of their land, of being punished for speaking Spanish, and of being threatened with deportation.

In the third phase of disaster recovery, many of these historical events appeared to be re-enacted. Thus, social class, which mirrored ethnic boundaries, played a significant role in people's reactions to phase three of disaster psychology.

As stated previously, the political climate in the two communities was different. The non-Anglo groups in Watsonville had considerable political success, while McClellanville residents had little to no political activism. Thus, in Watsonville, the poor and non-Anglo were more assertive and demanded, through confrontational politics, what they felt was their right. This process provided an outlet for their anger and gave them a sense of control. In McClellanville, the politically disenfranchised poor and nonwhite did not have a chance to vent their anger or take control. As a result, the McClellanville victims, in spite of having been through a disaster that normally would have produced fewer psychological problems (it did not come as a surprise, nor did it linger with aftershocks), did not recover from phase three as quickly as did the victims of Watsonville.

Phase Four: Final Recovery

Resolving losses comprised the final stage of psychological recovery. Because of time constraints, we did not study this phase as much as we would have liked. One important finding, however, was that victims had to be willing, no matter what help they had or had not received, to move forward with their lives. Our observations showed that for most people, resolution came slowly and incrementally. As time passed, disaster worries gave

way to the more common daily worries. This was also true for many of the relief services, which, instead of being solely directed toward disaster relief, became, after time, more concerned with other aspects of the victims' lives.

Three months after the earthquake, a group of community college volunteers went to San Andreas migrant camp, located within a mile of the Pacific Ocean, to assess long-term earthquake damage. The volunteers stopped at the first house to ask directions, and the man who lived there told them how wonderful it was to have volunteers come, particularly volunteers not associated with the government. He invited them inside to show them the damage his home had received from the earthquake, but instead explained his living conditions. He rented one room, about eight by 16 feet square, for \$500 a month. A sink and a small refrigerator were at one end of the room, and the living area had three mattresses on the floor. Two single light bulbs hung from the ceiling. The walls were lined with cardboard boxes full of clothes that reached to the man's chest.

The man pointed out a large hole in the roof near the sink, which he said was the result of the earthquake. However, the water stains from the rain that fell into the house seemed to indicate that the hole had been there for a longer time. The man said that he had gone to FEMA to register for aid, but a man from FEMA inspected his home and said there was little earthquake damage.

As the student volunteers left the house, they saw five legal aid lawyers from San Francisco interviewing people and hoping to gather information for a suit against FEMA. Rather than finding much earthquake damage, the attorneys found that most of the residents were concerned about being evicted. Evidently, some people had not paid their rent, and the landlord had announced he was coming that very day to collect it.

The volunteers walked to the next home and saw a single man about 25 years old carrying a large bottle of beer in one hand

and a stereo, which he was trying to sell, in the other. He said he was homeless as a result of the earthquake and was staying at the migrant camp in a tent behind a friend's house.

While the volunteers were talking to this man, two Anglo women drove up in a large car with clothes to donate. The women, who did not speak Spanish, left the clothes on a car parked in the center of camp. The residents who were there, mostly young men, charged the car to get the clothes. They emptied the boxes in moments, and the strongest boys got the most clothing.

The volunteers went to see another family. This house, larger than the first, had two bedrooms and rented for \$500 a month. It was neater and more organized than the other houses they had been in, and the belongings were well organized. Before leaving, the volunteers said they would come back soon. They took notes on what was needed and promised to deliver goods, find people for potential help, get answers to questions, and otherwise provide psychological support.

The three volunteer groups—the community college volunteers who visited houses, the lawyers seeking information for a claim, and the Anglo women who dropped off the clothes—were only some of the volunteers the victims had seen in the three months since the earthquake. For most people, the problems of the earthquake and the hurricane had blended with life's other problems: insufficient income, health problems, difficulties with parents or children, and problems with school or work. Most people were occupied with daily concerns that require constant decisions, not with the single disaster incident. Life in the migrant camp in Watsonville and in the poor shacks of McClellanville was continuing. As one man said, and he could have lived on either coast, "In the end we can only help ourselves, but we bless the people who have helped us." Let the rest of the people read the sign that was on Byron Weber's front yard "Sight seers go home."

CONCLUSIONS AND RECOMMENDATIONS

I have tried to show that many of the problems in these two disasters could have been avoided. The proposed phased response system, which takes into account the psychology of both victims and relief workers, is particularly helpful in seeing this. Many of the policy recommendations involve education and are designed to make relief workers more aware of how their actions are interpreted by the victims. Education need not be equated with lectures. Most of the information can probably be effectively learned through gaming exercises.

For example, in the first phase of recovery, as part of the healing process, victims immediately help their neighbors. Then, in the midst of this effort, the first wave of relief workers and help from outside the impacted area arrive. These responders have learned that victims do not make the best volunteers because they are often in shock, overly emotional, and often make mistakes. However, we found that dismissing the victim-volunteers resulted in reducing the ability of the disaster workers to function in the community in the later phases of disaster relief. Simulation exercises used as training tools should begin by having responders take different roles and then work different to satisfactory conclusions.

Educating and explaining to relief workers that denial is a mental process that helps victims slowly adapt to their own losses and to the trauma around them will also help reduce tensions between volunteers and relief workers. In a sense, victims need to deny their predicament, and even more surely, relief workers need to have victims to help. The more denial increased in victims of the two disasters studied, the less work there appeared to be for volunteers. Many volunteers, who gave time and physical and emotional energy, were dissatisfied to find few obvious victims. In some cases, jealousies developed among the volunteers. This increased the needs of the professional relief workers to increase their rules and regulations, inadvert-

ently making it more difficult for victims and volunteers. As the volunteers became more frustrated, they often took things into their own hands, becoming wildcat volunteers. This caused more problems for the relief agencies, forcing them to clamp down and become even more officious, and, so a self-reinforcing circle unfolded. Again, simulation exercises could be developed that would help educate the participants on what to expect during phase two of recovery. Relief workers could learn how rules and regulations affect victims and volunteers and could begin to understand the psychology of volunteers. This could remove many of the problems that surface when the good will of the volunteers is turned away. Other simulation exercises could examine denial and its relation to problems in families and schools.

Many victims and volunteers experienced anger during the third phase of recovery. Separating the pathological from the expected is never easy. Relief workers could be trained to expect and to deal with anger in victims and in themselves and to see its origins, not just in the damage caused by the disasters, but in the needs of people to cope with being victimized and in the healing they garner from helping others. The mental status exam, a structured type of interview that ascertains a person's current emotional state, their level of prior and current functioning, the variety of stressors they have, and their social supports, could be taught to relief workers. This has been done in Latin America (Lima et al., 1988; Lima et al., 1990) with good results.

Other basic mental health information gathering and therapeutic techniques can be taught to paraprofessionals. Taking a good history reveals that a person's level of mental health often returns to the same level after time. A person who has reacted well to past stress is likely to do so again, while a history of pathology is the best predictor for future problems. In addition, knowing that recovery is slow and incremental rather than immediate and dramatic and other such information could be valuable to

relief personnel. In general, relief personnel should be taught about the strange and subtle manifestations of stress symptoms.

Another problem not immediately apparent to relief workers from outside the community was the feeling victims had of being at the mercy of governmental agencies. Disasters often cause unfortunate experiences to be repeated for certain ethnic, racial, and social class groups in each of the two impacted communities. Learning about a community's local history, politics, and tensions is not difficult. As these two disasters clearly showed, the time spent learning about local social conditions would well be worth the effort.

REFERENCES

- Aptekar, L. and J. Boore
1990 "The Emotional Effects of Disaster on Children: A Review of the Literature." International Journal of Mental Health 19 (2): pp. 77-90.
- Baisdan, B. and E.L. Quarantelli
1981 "The Delivery of Mental Health Services in Community Disasters: An Outline of Research Findings." Journal of Community Psychology 9: pp. 195-203.
- Beigel, A. and M. Berren
1985 "Human-Induced Disasters." Psychiatric Annals 15 (3): pp. 143-150.
- Benedek, E.D.
1985 "Children and Disaster: Emerging Issues." Psychiatric Annals 15 (3): pp. 168-172.
- Berren, M.R., A. Beigel, and S. Ghertner
1980 "A Typology for the Classification of Disasters." Community Mental Health Journal 16: p. 103.
- Blom, G.E.
1986 "A School Disaster-Intervention and Research Aspects." Journal of the American Academy of Child Psychiatry 25 (3): pp. 336-345.
- Bravo, M., M. Rubio-Stipec, and G. Canino
1990 "Methodological Aspects of Disaster Mental Health Research." International Journal of Mental Health 19 (1): pp. 37-50.
- Breslau, N. and G. Davis
1987 "Post-Traumatic Stress Disorder: The Stressor Criterion." The Journal of Nervous and Mental Disease 175 (5): pp. 255-264.
- Bromet, E.
1989 "The Nature and Effects of Technological Failures." In Gist, R. and B. Lubin, ed., Psychosocial Aspects of Disaster. New York: Wiley.
- Bromet, E. and L. Dunn
1981 "Mental Health of Mothers Nine Months After the Three Mile Island Accident." Urban and Social Change Review 14 (2): p. 12.

- Burke, J.D., J.F. Borus, B.J. Burns, and K. Millstein
1982 "Changes in Children's Behavior After a Natural Disaster." American Journal of Psychiatry 139 (8): pp. 1010-1014.
- Canino, G., M. Bravo, M. Rubio-Stipec, and M. Woodbury
1990 "The Impact of Disaster on Mental Health: Prospective and Retrospective Analyses." International Journal of Mental Health 19 (1): pp. 51-69
- Caplan, G.
1981 "Mastery of Stress: Psychological Aspects." American Journal of Psychiatry 138: p. 413.
- Cobb, S. and E. Lindemann
1943 "Neuropsychiatric Observations." Annals of Surgery 117: p. 257.
- Cockburn, A.
1989 "Beat the Devil." The Nation (November 27): pp. 628-629.
- Cohen, R.E. and F.L. Ahearn, Jr.
1980 Handbook for Mental Health Care of Disaster Victims. Baltimore, Maryland: Johns Hopkins University Press.
- Cohen, S.B. and S.L. Syme, eds.
1985 Social Support and Health. Orlando, Florida: Academic Press.
- Comfort, L.
1990 "Turning Conflict into Cooperation: Organizational Designs for Community Response in Disasters." International Journal of Mental Health 19 (1): pp. 89-108.
- Crabbs, M.A.
1981 "School Mental Health Services Following an Environmental Disaster." The Journal of School Health 51 (3): pp. 165-167.
- Dames and Moore, Inc.
1989 "A Special Report on the October 17, 1989, Loma Prieta Earthquake." Los Angeles, California: Dames and Moore.
- de la Fuente, R.
1990 "The Mental Health Consequences of the 1985 Earthquakes in Mexico City." International Journal of Mental Health 19 (2): pp. 21-29.
- Edwards, J.G.
1976 "Psychiatric Aspects of Civilian Disasters." British Medical Journal 1: p. 994.

- Erickson, P., W. Drabek, W. Key, and J. Crowe
 1976 "Families in Disaster." Mass Emergencies 1:
 pp. 206-213.
- Erikson, K.T.
 1976a Everything in its Path: Destruction of Community in the Buffalo Creek Flood New York: Simon & Schuster.
 1976b "Loss of Community at Buffalo Creek." American Journal of Psychiatry 133 (3): pp. 302-305.
- Fairley, M., P. Langeluddecke, and C. Tennant
 1986 "Psychological and Physical Morbidity in the Aftermath of a Cyclone." Psychological Medicine 16 (3):
 pp. 671-676.
- Farberow, N.L. and N.S. Gordon
 1981 Manual for Child Health Workers in Major Disasters. Rockville, Maryland: U.S. Department of Health and Human Services.
- Federal Emergency Management Agency
 1990 Interagency Hazard Mitigation Team Report. Hurricane Hugo. Report #843 DR/SC. Washington, D.C.: Federal Emergency Management Agency.
- Frederick, C.J.
 1980 "Effects of Natural Versus Human Induced Violence Upon Victims." Evaluation and Change (Special Issue):
 pp. 71-75.
- Freud, S.
 1920 "Beyond the Pleasure Principal." Standard Edition,
 pp. 1-68. London: Hogarth Press.
- Gleser, G.C., B.L. Green, and C. Winget
 1981 Prolonged Psychosocial Effects of Disaster. A Study of Buffalo Creek. New York: Academic Press.
- Goffman, E.
 1971 Encounters: Two Studies in the Sociology of Interaction. New York: Bobbs-Merrill.
- Green, B.L.
 1982 "Assessing Levels of Psychological Impairment Following Disaster: Consideration of Actual and Methodological Dimensions." Journal of Nervous and Mental Disease 170:
 p. 544.

- 1986 "Conceptual and Methodological Issues in Assessing the Psychological Impact of Disasters." Pages 191-208 in B.J. Sowder and M. Lystad eds., Disasters and Mental Health: Contemporary Perspectives and Innovation in Services to Disaster Victims. Washington, D.C.: American Psychiatric Press.
- Green, B.L. and G.C. Gleser
 1983 "Stress and Long-term Psychopathology in Survivors of the Buffalo Creek Disaster." In D.F. Ricks and B.S. Dohrenwend, Origins of Psychopathology. Cambridge, Massachusetts: Cambridge University.
- Green, B.L., M.C. Grace, and G.C. Gleser
 1985 "Identifying Survivors at Risk: Long Term Impairment Following a Civilian Disaster." Journal of Consulting Clinical Psychology 53: pp. 672-678.
- Guha-Sapir, D. and M.F. Lechat
 1986 "Information Systems and Needs Assessment in Natural Disaster: An Approach for Better Disaster Relief Management." Disasters 10: p. 232.
- Horowitz, M. ed.
 1976 Stress Response Syndromes. New York: Jason Aronson.
- 1990 "Post-Traumatic Stress Disorders: Psychosocial Aspects of the Diagnosis." International Journal of Mental Health. 19 (1): pp. 21-36.
- Houts, P., P. Cleary, and T. Hu
 1988 The Three Mile Island Crisis: Psychological, Social, and Economic Impacts on the Surrounding Population. University Park, Pennsylvania: The Pennsylvania State University Press.
- Howard, S.J.
 1980 "Children and the San Fernando Earthquake." Earthquake Information Bulletin 12 (5): pp. 190-192.
- Kinzie, J.D., W.H. Sack, R.H. Angell, S. Manson, and B. Rath
 1986 "The Psychiatric Effects of Massive Trauma on Cambodian Children: I, the Children." Journal of the American Academy of Child Psychiatry 25 (3): pp. 370-376.
- Klingman, A.
 1987 "A School-Based Emergency Crisis Intervention." Professional Psychology: Research and Practice 18 (6): pp. 604-612.

- Kohn, R. and Itzhak L.
1990 "Bereavement in Disaster: An Overview of the Research." International Journal of Mental Health 19 (2): pp. 61-76.
- Lechat, M.
1990 "The Public Health Dimensions of Disasters" International Journal of Mental Health 19 (1): pp. 70-79.
- Leonard, D.
1983 "The Psychological Sequelae to Disasters." Australian Family Physician 12: p. 841.
- Lifton, R.J. and E. Olson
1976 "The Human Meaning of Total Disaster. The Buffalo Creek Experience." Psychiatry 39: pp. 1-18.
- Lima, B.R., H.S. Cruz, J. Lozano, J. Luna, and S. Pai
1988 "La Atencion Primaria de Salud Mental en las Victimas de Desastre de Armero." Acta Psiquiatrica y Psicologica de America Latina 34: p. 13.
- Lima, B., H. Santacruz, J. Lozano, H. Chavez, N. Samaniego, M. Silvia, and S. Pai.
1990 "Disasters and Mental Health: Experience in Colombia and Ecuador, and Its Relevance for Primary Care in Mental Health in Latin America." International Journal of Mental Health 19 (2): pp. 3-20.
- Lindemann, E.
1944 "Symptomatology and Management of Acute Grief." American Journal of Psychiatry 101: p. 141.
- Lindy, J.D. and M. Grace
1986 "The Recovery Environment: Continuing Stressor Versus a Healing Psychosocial Space." Pages 148-159 in Sowder, B.J. and M. Lystad eds., Disaster and Mental Health: Contemporary Perspectives and Innovation in Services to Disaster Victims. Washington, D.C.: American Psychiatric Press.
- McFarlane, A.C.
1986 "Long-term Psychiatric Morbidity After a Natural Disaster." The Medical Journal of Australia 145: pp. 561-563.
1990 "An Australian Disaster: The 1983 Bushfires." International Journal of Mental Health 19 (2): pp. 36-47.

- Mitchell, Jeffrey
1988 "The Impact of Stress on Emergency Service Personnel: Policy Issues in Emergency Response." Pages 199-216 in Comfort, L., ed., Managing Disaster: Strategies and Policy Perspectives, Durham, North Carolina: Duke University Press.
- Murphy, S.A.
1986 "Status of Natural Disaster Victims: Health and Recovery 1 and 3 Years Later." Research in Nursing and Health 9: pp. 331-340.
1987 "Self-Efficacy and Social Support Mediators of Stress on Mental Health Following a Natural Disaster." Western Journal of Nursing Research 9 (1): pp. 58-86.
- Newman, C.J.
1976 "Children of Disaster: Clinical Observations at Buffalo Creek." American Journal of Psychiatry 133 (3): pp. 306-312.
- Plafker, G. and J. Galloway, eds.
1990 "Lessons Learned from Loma Prieta California, Earthquake of October 17, 1989." United States Geological Survey Circular 1045. Washington, D.C.: United States Printing Office.
- Powell, B.J. and Penick, E.C.
1983 "Psychological Distress Following a Natural Disaster: A One-year Follow-up of 98 Flood Victims." Journal of Community Psychology 11: pp. 269-276.
- Quarantelli, E.L.
1986 "Social Support Systems: Some Behavioral Patterns in the Context of Mass Evacuation Activities." Pages 131-146 in Sowder, B.J. and M. Lystad, eds., Disaster and Mental Health: Contemporary Perspectives and Innovation in Services to Disaster Victims. Washington, D.C.: American Psychiatric Press.
- Quarantelli, E.L. and R.R. Dynes
1977 "Response to Social Crisis and Disaster." Columbus, Ohio: The Ohio State University Disaster Research Center.
- Rangell, L.
1976 "Discussion of the Buffalo Creek Disaster: The Course of Psychic Trauma." American Journal of Psychiatry 133 (3): pp. 313-316.

- Raphael, B.
1975 "Crisis and Loss: Counseling Following a Disaster." Mental Health in Australia 1: pp. 118-122.
- 1986 When Disaster Strikes: How Individuals and Communities Cope with Catastrophe. New York: Basic Books.
- Robbins, L.N., R.L. Fischback, E.M. Smith, L.B. Cotler, and S.D. Solomon
1986 "Impact of Disaster on Previously Assessed Mental Health." Pages 21-48 in Shore, J. and L. Robins, eds., Psychological Disaster Stress Studies: New Methods and Findings. Washington, D.C.: American Psychiatric Press.
- Sack, W.H., R.H. Angell, J.D. Kinzie, and B. Rath
1986 "The Psychiatric Effects of Massive Trauma on Cambodian Children: II. The Family, the Home, and the School." Journal of the American Academy of Child Psychiatry 25 (3): pp. 377-383.
- Schur, M.
1966 The Id and the Regulatory Process of the Ego. New York: International University Press.
- Seigler-Shelton, C. and L.N. Marks
1980 "The Wichita Falls Experience." Supervisor Nurse (April): p. 28.
- Seroka, C.M., C. Knapp, S. Knight, C.R. Siemon, and S. Starbuck
1982 "A Comprehensive Program for Postdisaster Counseling." Social Casework: The Journal of Contemporary Social Work 67 (1): pp. 37-44.
- Shore, J.H., ed.
1986 Disaster Stress Studies; New Methods and Findings. Washington, D.C.: American Psychiatric Press.
- Shore, J.H., E.L. Tatum, and W. Vollmer
1986 "Psychiatric Reactions to Disaster: The Mount St. Helens Experience." American Journal of Psychiatry 143: p. 590.
- Silber, E., Perry, S.E., and D.A. Bloch
1958 "Patterns of Parent-child Interaction in a Disaster." Psychiatry 21 (2): pp. 59-167.
- Smith, Bob
1989 "It May Not Be Over Yet." Register-Pajaronian. October 19, 1989. Watsonville, California.

Smith, Elizabeth

- 1986 "Psychosocial Consequences of a Disaster." Pages 51-76 in Shore J. and L. Robins, eds., In Disaster Stress Studies; New Methods and Findings. Washington, D.C.: American Psychiatric Press.

Smith, E., L. Robins, T. Przybeck, E. Goldring, and S. Solomon

- 1986 "Psychological Consequences of a Disaster." In Shore, J.H., ed., Disaster Stress Studies: New Methods and Findings. Washington, D.C.: American Psychiatric Press.

Terr, L.C.

- 1981a "Forbidden Games." Journal of the American Academy of Child Psychiatry 20: pp. 741-760.

- 1981b "Psychic Trauma in Children: Observations Following the Chowchilla School-Bus Kidnapping." American Journal of Psychiatry 138 (1): pp. 14-19.

- 1985 "Psychic Trauma in Children and Adolescents." Psychiatric Clinics of North America 8 (4): pp. 815-835.

Titchener, J.L. and F.T. Kapp

- 1976 "Family and Character Change at Buffalo Creek." American Journal of Psychiatry 133 (3): pp. 295-299.

Trabing, W.

- 1989 "Fifteen Minutes Was All They Got." Santa Cruz Sentinel, November 2, 1989. Santa Cruz, California.

Tuckman, A.

- 1973 "Disaster and Mental Health Intervention." Community Mental Health Journal 9: pp. 151-157.

Ward, P. and R. Page

- 1990 The Loma Prieta Earthquake of October 17, 1989. Washington, D.C.: United States Geological Survey.

Warheit, G.J.

- 1986 "A Propositional Paradigm for Estimating the Impact of Disasters on Mental Health." Pages 209-228 in Sowder, B.J. and M. Lystad, eds., Disasters and Mental Health: Contemporary Perspectives and Innovation in Services to Disaster Victims. Washington, D.C.: American Psychiatric Press.

NATURAL HAZARD RESEARCH WORKING PAPER SERIES
Institute of Behavioral Science #6
Campus Box 482
University of Colorado
Boulder, Colorado 80309

The Natural Hazard Research Working Paper series provides a timely method for presenting research in progress in the field of human adjustments to natural hazards. These papers are intended to be both working documents for the group of scholars directly involved in hazard research as well as information sources for the larger circle of interested persons.

Single copies of working papers cost \$4.50 per copy. It is also possible to subscribe to the working paper series; subscription entitles the subscriber to receive each new working paper at the special discount rate of \$3.00 per copy. When a new working paper is sent to a subscriber it is accompanied by a bill for that volume. Papers sent beyond North America cost an additional \$1.00.

- 1 The Human Ecology of Extreme Geophysical Events, Ian Burton, Robert W. Kates, and Gilbert F. White, 1968, 37 pp.
- 2 Annotated Bibliography on Snow and Ice Problems, E.C. Relph and S.B. Goodwillie, 1968, 16 pp.
- 3 Water Quality and the Hazard to Health: Placarding Public Beaches, J.M. Hewings, 1968, 74 pp.
- 4 A Selected Bibliography of Coastal Erosion, Protection and Related Human Activity in North America and the British Isles, J.K. Mitchell, 1968, 70 pp.
- 5 Differential Response to Stress in Natural and Social Environments: An Application of a Modified Rosenzweig Picture-Frustration Test, Mary Barker and Ian Burton, 1969, 22 pp.
- 6 Avoidance-Response to the Risk Environment, Stephen Golant and Ian Burton, 1969, 33 pp.
- 7 The Meaning of a Hazard--Application of the Semantic Differential, Stephen Golant and Ian Burton, 1969, 40 pp.
- 8 Probabilistic Approaches to Discrete Natural Events: A Review and Theoretical Discussion, Kenneth Hewitt, 1969, 40 pp.
- 9 Human Behavior Before the Disaster: A Selected Annotated Bibliography, Stephen Golant, 1969, 16 pp.

- 10 Losses from Natural Hazards, Clifford S. Russell, (reprinted in Land Economics), 1969, 27 pp.
- 11 A Pilot Survey of Global Natural Disasters of the Past Twenty Years, Research carried out and maps compiled by Lesley Sheehan, Paper prepared by Kenneth Hewitt, 1969, 18 pp.
- 12 Technical Services for the Urban Floodplain Property Manager: Organization of the Design Problem, Kenneth Cypra and George Peterson, 1969, 25 pp.
- 13 Perception and Awareness of Air Pollution in Toronto, Andris Auliciems and Ian Burton, 1970, 33 pp.
- 14 Natural Hazard in Human Ecological Perspective: Hypotheses and Models, Robert W. Kates (reprinted in Economic Geography, July 1971), 1970, 33 pp.
- 15 Some Theoretical Aspects of Attitudes and Perception, Myra Schiff (reprinted in Perceptions and Attitudes in Resources Management, W.R.D. Sewell and Ian Burton, eds.), 1970, 22 pp.
- 16 Suggestions for Comparative Field Observations on Natural Hazards, Revised Edition, October 20, 1970, 31 pp.
- 17 Economic Analysis of Natural Hazards: A Preliminary Study of Adjustment to Earthquakes and Their Costs, Tapan Mukerjee, 1971, 37 pp.
- 18 Human Adjustment to Cyclone Hazards: A Case Study of Char Jabbar, M. Aminul Islam, 1971, 60 pp.
- 19 Human Adjustment to Agricultural Drought in Tanzania: Pilot Investigations, L. Berry, T. Hankins, R.W. Kates, L. Maki, and P. Porter, 1971, 69 pp.
- 20 The New Zealand Earthquake and War Damage Commission--A Study of a National Natural Hazard Insurance Scheme, Timothy O'Riordan, 1971, 44 pp.
- 21 Notes on Insurance Against Loss from Natural Hazards, Christopher K. Vaughan, 1971, 51 pp.
- 22 Annotated Bibliography on Natural Hazards, Anita Cochran, 1972, 90 pp.
- 23 Human Impact of the Managua Earthquake Disaster, R.W. Kates, J.E. Haas, D.J. Amaral, R.A. Olson, R. Ramos, and R. Olson, 1973, 51 pp.
- 24 Drought Compensation Payments in Israel, Dan Yarden, 1973, 25 pp.

- 25 Social Science Perspectives on the Coming San Francisco Earthquake-Economic Impact, Prediction, and Construction, H. Cochrane, J.E. Haas, M. Bowden and R. Kates, 1974, 81 pp.
- 26 Global Trends in Natural Disasters, 1947-1973, Judith Dworkin, 1974, 16 pp.
- 27 The Consequences of Large-Scale Evacuation Following Disaster: The Darwin, Australia Cyclone Disaster of December 25, 1974, J.E. Haas, H.C. Cochrane, and D.G. Eddy, 1976, 67 pp.
- 28 Toward an Evaluation of Policy Alternatives Governing Hazard-Zone Land Uses, E.J. Baker, 1976, 73 pp.
- 29 Flood Insurance and Community Planning, N. Baumann and R. Emmer, 1976, 83 pp.
- 30 An Overview of Drought in Kenya: Natural Hazards Research Paradigm, B. Wisner, 1976, 74 pp.
- 31 Warning for Flash Floods in Boulder, Colorado, Thomas E. Downing, 1977, 80 pp.
- 32 What People Did During the Big Thompson Flood, Eve C. Gruntfest, 1977, 62 pp.
- 33 Natural Hazard Response and Planning in Tropical Queensland, John Oliver, 1978, 63 pp.
- 34 Human Response to Hurricanes in Texas--Two Studies, Sally Davenport, 1978, 55 pp.
- 35 Hazard Mitigation Behavior of Urban Flood Plain Residents, Marvin Waterstone, 1978, 60 pp.
- 36 Locus of Control, Repression-Sensitization and Perception of Earthquake Hazard, Paul Simpson-Housley, 1978, 45 pp.
- 37 Vulnerability to a Natural Hazard: Geomorphic, Technological, and Social Change at Chiswell, Dorset, James Lewis, 1979, 39 pp.
- 38 Archeological Studies of Disaster: Their Range and Value, Payson D. Sheets, 1980, 35 pp.
- 39 Effects of a Natural Disaster on Local Mortgage Markets: The Pearl River Flood in Jackson, Mississippi--April 1979, Dan R. Anderson and Maurice Weinrobe, 1980, 48 pp.
- 40 Our Usual Landslide: Ubiquitous Hazard and Socioeconomic Causes of Natural Disaster in Indonesia, Susan E. Jeffery, 1981, 63 pp.

- 41 Mass Media Operations in a Quick-onset Natural Disaster: Hurricane David in Dominica, Everett Rogers and Rahul Sood, 1981, 55 pp.
- 42 Notices, Watches, and Warnings: An Appraisal of the USGS's Warning System with a Case Study from Kodiak, Alaska, Thomas F. Saarinen and Harold J. McPherson, 1981, 90 pp.
- 43 Emergency Response to Mount St. Helens' Eruption: March 20-April 10, 1980, J.H. Sorensen, 1981, 70 pp.
- 44 Agroclimatic Hazard Perception, Prediction and Risk-Avoidance Strategies in Lesotho, Gene C. Wilken, 1982, 76 pp.
- 45 Trends and Developments in Global Natural Disasters, 1947 to 1981, Stephen A. Thompson, 1982, 30 pp.
- 46 Emergency Planning Implications of Local Governments' Responses to Mount St. Helens, Jack D. Kartez, 1982, 29 pp.
- 47 Disseminating Disaster-Related Information to Public and Private Users, Claire B. Rubin, 1982, 32 pp.
- 48 The Nino as a Natural Hazard; Its Role in the Development of Cultural Complexity on the Peruvian Coast, Joseph J. Lischka, 1983, 69 pp.
- 49 A Political Economy Approach to Hazards: A Case Study of California Lenders and the Earthquake Threat, Sallie Marston, 1984, 35 pp.
- 50 Restoration and Recovery Following the Coalinga Earthquake of May, 1983, Steven P. French, Craig A. Ewing, and Mark S. Isaacson, 1984, 30 pp.
- 51 Emergency Planning: The Case of the Diablo Canyon Power Plant, June Belletto de Pujo, 1985, 63 pp.
- 52 The Effects of Flood Hazard Information Disclosure by Realtors: The Case of the Lower Florida Keys, John Cross, 1985, 85 pp.
- 53 Local Reaction to Acquisition: An Australian Study, John W. Handmer, 1985, 96 pp.
- 54 The Environmental Hazards of Colorado Springs, Eve Gruntfest and Thomas Huber, 1985, 62 pp.
- 55 Disaster Preparedness and the 1984 Earthquakes in Central Italy, David Alexander, 1986, 98 pp.

- 56 The Role of the Black Media in Disaster Reporting to the Black Community, Charles H. Beady, Jr. and Robert C. Bolin, 1986, 87 pp.
- 57 The 1982 Urban Landslide Disaster at Ancona, Italy, David Alexander, 1986, 63 pp.
- 58 Gender Vulnerability to Drought: A Case Study of the Hausa Social Environment, Richard A. Schroeder, 1987, 75 pp.
- 59 Have Waste, Will Travel: An Examination of the Implications of High-Level Nuclear Waste Transportation. Ann FitzSimmons, 1987, 145 pp.
- 60 Post-Impact Field Studies of Disasters and Sociological Theory Construction, Robert A. Stallings, 1987, 65 pp.
- 61 The Local Economic Effects of Natural Disasters, Anthony M. Yezer and Claire B. Rubin, 1987, 75 pp.
- 62 Primary Mental Health Care in Disasters: Armero Colombia, Bruno R. Lima et al., 1988, 54 pp.
- 63 Emergency Public Information: A Quick Response Study of Coalinga, Geoffrey P. Stockdale and Rahul Sood, 1989, 52 pp.
- 64 Climate Change and Water Resources in the Sacramento-San Joaquin Region of California, William E. Reibsame and Jeffrey W. Jacobs, 1989, 74 pp.
- 65 The Greenhouse Effect: Recent Research and Some Implications for Water Resource Management, Jeffrey W. Jacobs and William E. Reibsame, 1989, 70 pp.
- 66 Utilization of the Mortgage Finance and Insurance Industries to Induce the Private Procurement of Earthquake Insurance: Possible Antitrust Implications, James M. Brown and Peter M. Gerhart, 1989, 120 pp.
- 67 Hurricane Gilbert: The Media's Creation of the Storm of the Century, Henry W. Fischer III, 1989, 75 pp.
- 68 Flood Insurance and Relief in the U.S. and Britain, John W. Handmer, 1990, 37 pp.
- 69 Disaster Recovery After Hurricane Hugo in South Carolina, Claire B. Rubin and Roy Popkin, 1991, 92 pp.