



RACE, RELIGION, AND ETHNICITY IN DISASTER RECOVERY

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and
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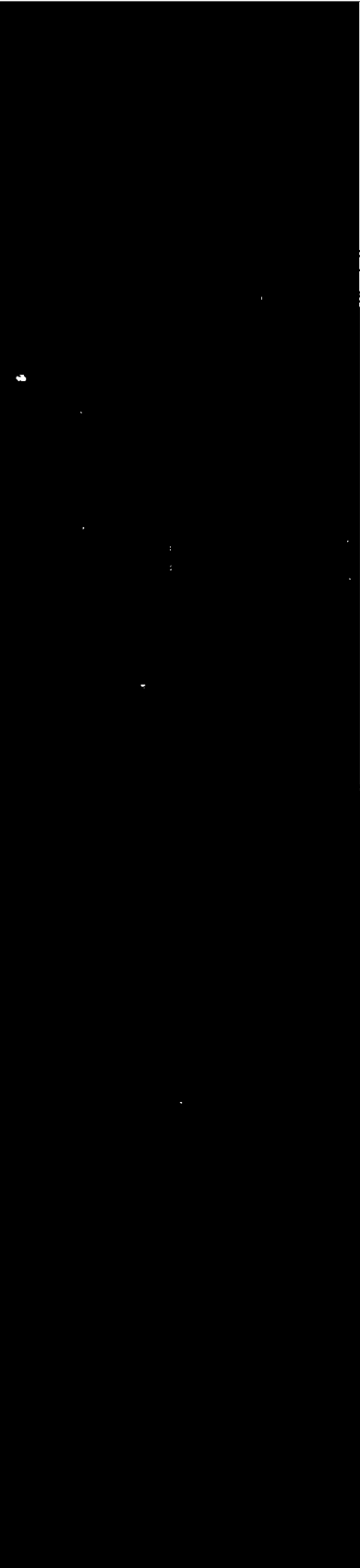
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PREFACE

This study grows out of work that each of the authors have previously done on the dynamics, in various social contexts, of family recovery from disasters. In those earlier studies, the importance of ethnicity and race was left largely unexplored. Our previous research did note the importance of culture, age, and social class as determinants of patterns of aid utilization. To that mix of social variables we now add race and ethnicity (and/or religious affiliation) as additional pieces in the puzzle of family recovery.

Four sites are discussed, each with its own mix of disaster agents, ethnic groups, patterns of destruction, aid utilization, and victim recovery. We examined a tornado in Texas, a flood in Utah, an earthquake in California, and a hurricane in Hawaii. Groups affected by the disasters were, among others, blacks, Hispanics, Japanese-Americans, Filipinos, and Mormons. This study looks at various factors--particularly aid from official and "unofficial" sources--that affected the recovery of those disaster victims.

The United States has an institutionalized structure of public and private organizations that aid the victims of natural disasters. Our study examines some of the patterns of aid utilization across the various groups of victims and the effects of such programs on victim recovery. Understanding the complexities of a dynamic social process like family recovery requires consideration of a large number of influences. While we have attempted to focus on those judged to be most relevant, there always remains the possibility that others not examined here may prove to have greater explanatory power. This work should be read as part of the continuing effort of several researchers to understand and conceptualize the process of long-term family recovery from disasters.

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CHAPTER I INTRODUCTION

Study Areas

When this research began in early 1982, our primary goal was to examine the differential effects of various types of aid and aid programs on the postdisaster recovery of black and Mexican-American victims in comparison to "non-minority" victims. We have remained faithful to that goal although we have expanded the number of ethnic and cultural groups examined beyond those originally proposed for study. This increase was accomplished in part by adding research sites to the original two sites designated for study and, in part, by including one multi-ethnic site (Hawaii) in our research.

The research grows out of previous research that both authors have worked on, independently and jointly, including comparisons of disaster recovery between two cultures (Bolin and Trainer, 1978; Bolin and Bolton, 1983), between rural and urban areas (Bolin, 1981), and between elderly and non-elderly disaster victims (Bolin and Klenow, 1983). Our focus in this research is on aid from federal, state, and local agencies and its effects on the recovery of victim families from disasters. In addition to these formal aid programs, we also consider aid and social support received from family, friends, and neighbors. We identify variations in patterns of aid utilization across several racial and ethnic groups at four disaster sites, and demonstrate how these patterns are associated with differential rates of family recovery.

The four sites studied include (in order of consideration):

- 1) Paris, Texas (tornado)
- 2) Salt Lake City, Utah (flooding)
- 3) Kauai, Hawaii (hurricane)
- 4) Coalinga, California (earthquake)

Patterns of aid utilization and family recovery are examined and compared among minority groups as well as between minorities and whites. From these comparisons, policy recommendations are developed and presented regarding the nature of rehabilitation and recovery programs offered to disaster victims.

Three of the four sites were studied using general sociological

survey techniques. The exception, Salt Lake City, was analyzed using in-depth interviewing techniques on a small sample of victims and disaster agency personnel. The different methods used in Salt Lake City reflect a conscious choice on our part: the technique was considered most appropriate to that disaster site given the scope of impact and the actual numbers of victims involved. However, as discussed in the methods section, the interview protocol was derived from the schedule used at the other sites and thus is comparable, although not statistically.

While our intent in this research--to examine the nature of aid utilization by victims and their recovery patterns--is not new (e.g., Bolin, 1982; Drabek and Key, 1984), the study does break new ground in that the victims represent a range of ethnic (as well as religious) groups. The groups studied, of course, are cross-cut by age and social class dimensions that have been found in other research to affect disaster response and recovery outcomes. This study also departs from previous research in that we examine victims of a number of different disaster agents (earthquakes, floods, hurricanes, and tornadoes).

The number of influences on how families respond to and recover from disaster are potentially limitless. Our goal here is to focus on a limited number of variables--such as ethnicity and its accompanying cultural features, aid utilization (or the lack thereof), social support, demographic and social class, as well as the physical impacts of the disaster agent itself--and to give a broad overview of the family recovery process across the several ethnic groups and disaster sites examined.

Because of the range of disaster impacts, ethnic groups, and social responses that we encountered, each chapter focuses on somewhat different features of disaster recovery, depending on what, in each case, we considered most pertinent for understanding recovery at that particular site. For example for the Paris, Texas disaster, race, social class, and age are singled out, while culture (religion) is concentrated on in the Salt Lake City case. Thus, the varying sites provided us with a unique opportunity to study the recovery process for different social groups in different social contexts with varying degrees of local, state, federal, and private disaster aid available to the victims.

Organization of the Book

This report is divided into six major chapters. General theoretical and conceptual issues are discussed in Chapter II, and a brief review of previous research is given. Chapter III is about the Paris, Texas tornado. Chapter IV describes the effects of the Salt Lake City flood. Chapter V analyzes the impacts of Hurricane Iwa on Kauai. Chapter VI deals with the Coalinga, California earthquake. The final chapter presents our findings and suggests explanations for differences in recovery and outcome.

We outline the particular instruments, research sites, sampling techniques, and field procedures for each study site in each chapter. Following a discussion of disaster agent and site characteristics, the general features of the population sample--including ethnic, demographic, and disaster loss characteristics--are examined. The analysis for each site continues with consideration of material losses, injuries, temporary housing and related residential dislocations, disaster impacts on family interaction and social support networks, psychosocial impacts, aid programs and their utilization, insurance use, and related social dynamics. One intent of the analysis is to refine a multivariate model of family recovery conceptualized and developed in an earlier research project (Bolin, 1982). Multiple regression and related multivariate statistical techniques are used in reviewing the data from most of the sites in order to select sets of important determinants of family recovery.

CHAPTER II

THEORETICAL AND RESEARCH ISSUES

This research focuses on variations, due to differences in ethnicity and class, in disaster victims' ability to cope with and recover from losses and disruptions incurred during natural disasters. The study of the complex interplay of class and culture comprises a major portion of all sociological research. Therefore, in order to avoid a voluminous literature review, we only cite pertinent work concerning disasters and analogous social situations. However, the identification of disasters and "analogous situations" itself implies a theoretical perspective, and before reviewing the literature, we first detail that perspective which has guided this research.

Families and Stress

Social Systems, Subsystems, and Stress

System and system stress are general sociological concepts that have been readily accepted by a number of disaster researchers who have focused on the family as a unit of analysis (e.g., Drabek et al., 1975. Drabek and Key, 1984; Bolin, 1982). It should be noted that the conceptual use of "systems" in the research reviewed here, and in our research as well, should not be confused with formal general systems theory (e.g., Buckley, 1967) which was popular in the 1960s among some theorists. General systems theory is now moribund--a perspective whose promise outweighed its utility (e.g., Ritzer, 1983). Nor is the use of general notions of social systems here to be confused with the static and politically loaded structural-functionalism popularized by Parsons (1951). System is used in this research as a sensitizing concept, a word that alerts the researcher and reader to possible interactions between various actions of society in specific circumstances. Unlike Parsonian functionalism, the idea does not rely on theoretical tautologies of functional requisites or system homeostasis.

We have followed what is referred to as an "open systems perspective" (e.g., Drabek and Key, 1984) in which the family system--an interdependent set of coresidential persons linked by blood, marriage, or both--is viewed as having varying degrees of interaction with other

social entities (systems) in its environment (Kantor and Lehr, 1975). The family is an "open system" because it interacts with the environing social order, either with kin, neighborhood, community, or the economic structures of society.

Haas and Drabek (1970) as well as others (e.g., Mileti et al., 1975) utilize the notion of system stress as a part of the open systems perspective. Stress, according to these authors, is said to exist when the demands on a social system exceed the system's ability to respond to all demands. In this context, disasters are viewed as creating a set of demands on a stricken family (e.g., search, rescue, evacuation, clean-up, reconstruction). Many families cannot respond to all such demands unless they acquire additional resources, and the stress they experience therefore initiates a set of coping responses--responses that are in fact the subject of this report. These coping strategies usually involve obtaining additional material, social, and/or psychological resources. Families may acquire necessary resources through a variety of social support systems including kin, neighborhoods, formal disaster agencies (FEMA, Red Cross, etc.), and informal and/or local organizations (churches, civic organizations, etc.). Thus, the linkages families establish with various entities in the community constitute systems of interaction (Wellman, 1974) that can facilitate a family's response and recovery from disaster. In our analysis we focus on a number of these systems: the victim family/kin group system, the victim family/neighborhood system, and the victim family/disaster organization system. The latter includes all organizations, formal and informal, that a family utilizes in their recovery.

Families and Social Support

The relationships a family has with its kin group are the subject of much sociological research (see Lee, 1980, for a relatively recent review of these studies). Most of this work points out the importance of kin relations for American families, whether in or out of crisis. The extensiveness of kin relations and the strength and energy of the ties typically vary by class and ethnicity, with blacks, Hispanics, and certain religious groups maintaining more active relationships than others (Lee, 1980; Staples and Mirande, 1980).

Recently, research has focused on social support networks--sets of

persons that families and individuals rely on in times of crisis. The concept of social support has been important for some time in sociological research on the family (e.g., McCubbin et al., 1980; Stack, 1974; Lopata, 1978; Cantor, 1979). In the studies done so far involving chronic and acute stress (Kahn and Antonucci, 1980), social support has been found to moderate or buffer the effects of both. Social support, of course, is unlikely to occur in the absence of available resources for those giving support to the stricken, whether those resources are material or psychological (Bolin, 1983). Kahn and Antonucci (1980) have also suggested that the quality of the support given is perhaps more important as a stress mitigator than the sheer number of persons in the support network.

Kahn and Antonucci (1980) identify three elements in social support --affect, affirmation, and aid. The authors define affect as the emotional component of social support, affirmation as agreement by those in support with the statements and behaviors of those in crisis, and aid as transactions in which direct aid (money, labor, etc.) is given by the support networks. The first and third have particular currency for disaster research and will be discussed later.

Disasters and the Disruption of Social Support

The specific role of social support in family response to disasters has been considered by several researchers who have discussed the issue both in terms of kinship relations and in the more recently developed jargon of social support networks. Drabek and his colleagues have shown the kin support network to constitute a key decision-making context regarding potential evacuation (Drabek, 1969; Drabek and Boggs, 1968; see also Clifford, 1956). Further, Drabek et al. (1975) have examined the effects of disasters on the number and quality of ties or linkages that disaster victims maintain or create with their friends and relatives. In general, the data show (e.g., Drabek and Key, 1984; Bolin, 1976) that disasters often strengthen the relationships that victims have with their primary support groups, if such ties were relatively sound to begin with. More recently Bolin (1983) found social support to have a role in mitigating psychosocial disruption due to disaster. In his study Bolin (1983, p. 11) writes

Social support should be seen as part of the coping mechanisms that can be used by disaster victims to reduce the . . . stresses placed on them. . . . Not all disaster victims have such networks available nor do all disaster victims utilize them even if they are. Support of the primary group can provide victims with types of aid that formal organizations cannot. . . . Also, . . . the so-called therapeutic community seems to increase the willingness of support networks to help victims in whatever ways necessary.

The role of support networks as "stress buffers" has recently been suggested in other disaster literature (Golec, 1982; Bahr and Harvey, 1979) as well as in the more general stress research (e.g., Kahn and Antonucci, 1980).

In cultures with strong kinship systems, extended kin function as a primary giver of both emotional and material aid promoting family recovery (Bolton, 1979; Bolin and Bolton, 1983). In societies that emphasize kinship less, support networks have been shown to provide important affective support mitigating the effects of disaster trauma (Bolin, 1976; Drabek and Key, 1984).

The death of family members and other close persons is the most direct way disasters disrupt social support networks. In the Buffalo Creek disaster, for example, one half of the survivors had lost close friends or relatives (Gleser et al., 1981), significantly disrupting traditional support networks and greatly adding to the survivors' grief and bereavement. Children are particularly vulnerable to psychological impairment as a result of death in the family (Perry and Perry 1959; Blaufarb and Levine, 1972).

Societal responses to disasters--such as evacuation, temporary housing, and relocation--can also disrupt social support networks and place additional stress on victims. Several studies have discussed relatives as providers of emergency shelter for disaster victims and evacuees (Instituut voor Sociaal Onderzoek, 1955; Moore, 1964; Bates et al., 1963; Davis, 1977; Trainer and Bolin, 1976; Loizos, 1977; Bolin, 1982)--an important social support function. Evacuation is a relatively common response to both human-caused (Houts et al., 1980; Levine, 1981) and natural disasters (Drabek, 1969; Drabek and Boggs, 1968). Evacuation is often to the homes of relatives, thus placing victims in a socially supportive context (e.g., Loizos, 1977); this is particularly true of

societies in which the responsibility to kin overrides such problems as overcrowding and increased monetary demands (Loizos, 1977; Bolton, 1979). However, in situations where families are separated during evacuation (e.g., Young, 1954; Boyd, 1981) or evacuate to the homes of non-kin (e.g., Instituut voor Sociaal Onderzoek, 1955), the likelihood of negative psychological impacts is increased significantly. Other research has indicated (Bolin, 1982; Bolin, 1984) that beyond a period of approximately one month, the relationship between a host family and evacuee family, even if they are kin, begins to deteriorate, resulting in a possible breakdown in the social support offered by the host family. The deterioration is usually manifested in interpersonal conflict due to crowding and money problems (Bolin, 1984) and is another potential stress on the evacuated family (cf., Loizos, 1977). Thus, while evacuation can result in victim families being physically close to primary group support, under some circumstances such support may break down. This is particularly likely in cultures in which there are not strong kinship ties.

Temporary housing is another societal response that can disrupt support networks. Temporary housing as well as longer-term or permanent relocation results in "relocation stressors" (Parker, 1977, p. 548). Because temporary housing is frequently located away from the impact zone of a disaster (e.g., Bolton, 1979; Davis, 1977) and frequently also away from established transportation systems (Davis, 1977; Ciborowski, 1967), the emotional benefits of social support in a familiar surrounding may be denied relocated victims. The inability to move back to former neighborhoods increases psychological stress on victims (Miller et al., 1981), in part by denying them the therapeutic effect of social support in the post-disaster community (Milne, 1977; Wettenhall, 1979). For example, following the large scale evacuation of Darwin, Australia after a devastating cyclone, those evacuees who could not return to their homes and neighborhoods suffered the most stress and exhibited the greatest number of psychosocial problems (Western and Milne, 1979).

In addition, the temporary housing itself often causes additional stress. Trailers, in particular, seem to cause difficulties, especially if the trailers are placed in camps or courts specifically constructed for disaster victims (Bolin, 1982; Quarantelli, 1982). Not only do such

courts remove victims from the supportive environment of their old neighborhoods (Bolin, 1982), they can also add to victims' fear of disaster recurrence if the camps are located in perceived high risk areas as happened at Buffalo Creek (Erikson, 1976). Because trailers are issued on a first come, first served basis, the temporary housing camps seldom reflect the social patterns of the preimpact neighborhoods (Gleser et al., 1981) and as a consequence can create "further disruption to social networks. . . retarding the reintegration of families into established neighborhoods" (Trainer and Bolin, 1976, p. 55).

Several researchers have also pointed out that temporary housing is often found by victims to be crowded and of substandard quality (Birnbaum et al., 1973; Bolin, 1982), culturally inappropriate (Hogg, 1980; Mitchell, 1976; Mitchell and Miner, 1978), or accompanied by excessive bureaucratic intrusion (sometimes perceived as harassment from officials) into the lives of the occupants (Bolin, 1982). As one respondent reported (Bolin, 1982, p. 171), "We lived in a FEMA trailer for five months; for the last two months the lady from FEMA hounded us about when we would be moving out. I had been injured and. . . in the hospital so this treatment particularly bothered me."

Relocation and its attendant disruption of neighborhood patterns, social support networks, and familiar surroundings also compounds the stress that victims experience (Ahearn and Castellon, 1979; Tierney and Baisden 1979; Dudasik, 1980). Because the stressful effects of evacuation, temporary housing, and relocation are long-term (Erikson, 1976; Bolin, 1982; Hogg, 1980), they may produce chronic or delayed stress disorders among victims; and because such social responses to disasters tend to isolate victims from the needed comfort of their support networks, those effects may be compounded.

In the case of human-caused disasters such as Love Canal (Levine, 1981), there is no acute impact phase at all. Instead, a period of chronic threat and uncertainty is followed by the dispersal and relocation of the victims. At Love Canal the chronic stress of being exposed to toxic chemicals of uncertain danger was followed by the loss of homes (see Fried, 1966) and the disruption of neighborhood support networks as victims were relocated across a wide area away from the danger zone (Holdren, 1982).

Family Stress: A General Model

Families as social systems undergoing stress due to either internal or external factors have long been the subject of sociological research, and much of the current work is influenced by the half century of family stress research that began with Burgess (1926) and a number of studies examining how families responded to the capitalist economic crisis of the 1930s in the U.S. (e.g., Angell, 1936; Cavan and Ranck, 1938; Koos, 1946). Perhaps the most influential development has been Hill's classic family stress model--the so-called A,B,C,-X formulation (Hill, 1949; also Hill, 1958; Hill and Hansen, 1962). This model suggests that A (the stress event--in Hill's work, war-induced spousal separation) interacts with B (a family's stress-meeting resources) and with C (family perception or definition of the situation) to produce -X (the crisis situation). According to Hill (1949) the family is initially disorganized by the stressor, but then goes through a recovery phase in which it reestablishes some level of organization and equilibrium.

Burr (1973), as part of his effort to develop a comprehensive deductive theory of family behavior, has expanded Hill's model. Burr introduces concepts of vulnerability and regenerative power, and his model suggests that the stressor event coupled with the level of a family's vulnerability (amount of resources) influences the severity of the crisis experienced by the family. In addition, a family's definition of the stress event influences their vulnerability, and their regenerative power affects their ability to recover from the disruption.

Much of the clinical and sociological research on family stress depends on and shares particular terms and definitions. Stressors are often defined as any life events of such magnitude that they cause change in families (McCubbin, 1980). Similarly, stress consists of family responses to stressors and generally refers to tensions and disruptions not adequately dealt with by the family (Burr, 1973). Crisis is the extent of disorganization due to a lack of family coping resources (Burr, 1973; Lipman-Blumen, 1975). Lipman-Blumen has offered a comprehensive categorization tool for assessing family crises (such as those produced by disaster), as well as for classifying stressors. The system classifies crises and stressors by the following dimensions (Lipman-Blumen, 1975, p. 890): internality vs. externality; pervasiveness vs. bounded-

ness; precipitate onset vs. gradual onset; intensity vs. mildness; transitoriness vs. chronicity; randomness vs. expectability; natural vs. artificial origin; perceived unsolvability vs. solvability. This system is similar to a number of classification models for disasters (e.g., Barton, 1970).

While, in our research, disasters are viewed as major disruptive and stress-producing events, it must be remembered that families experience continual stresses as a result of routine as well as unexpected events, e.g., birth of a child, divorce, widowhood, unemployment, residential changes, illness (McCubbin et al., 1980). Thus, disasters were rarely the first or only stress-producing event in the families studied.

In the literature there seems to be a tendency to view the family as a closed system, reacting to stressors based on internal resources (e.g., Hill, 1958; Hansen and Hill, 1979). McCubbin and his colleagues have suggested that more attention be paid to the links that families under stress establish with various support networks (McCubbin, 1979; McCubbin et al., 1980). As noted previously, such support networks will be considered as an important coping resource for families impacted by disasters (Bolin, 1982). In this research such extra-familial support systems include kin, neighborhood, formal disaster agencies, and informal/local organizations.

Disaster Research and Long-Term Impacts

This study is but one part of a large body of research conducted by social scientists on the many aspects of human response to disaster. A great deal of research has been conducted on the warning, impact, and evacuation phases of disaster (e.g., Mileti et al., 1975; Perry et al., 1980). However, because the research discussed here focuses on long-term recovery, the literature reviewed will be restricted to those studies which relate to the long-term effects of disasters on families and individuals.

Disasters and Mental Health

One growing area of research concerns the short- and long-term impacts of disasters on mental health. Although this has been a concern of disaster researchers for decades, there is a surprising lack of consensus concerning whether such impacts exist to any significant extent

and, if so, how to detect and measure them (Perry and Lindell, 1978; Quarantelli, 1979). In general, sociological research has seldom found severe psychopathologies among disaster victims, but rather has focused on transitory mental health problems and problems in coping.

Available literature may be divided into two general groups: so-called clinical studies and more broadly focused disaster case studies using general sociological survey techniques. In the clinical studies, much of the evidence for mental health problems as a result of environmental stresses derives from studies of human-caused "disasters" such as war and the war-related experiences of survivors (e.g., Chodoff, 1970; Hocking, 1970; Segal, 1974), nuclear war (e.g., Lifton, 1967), fires, explosions, and accidents (e.g., Lindy et al., 1981; Carlton, 1980; Raphael, 1977). Many of the recent clinical studies focus on one event in particular, the Buffalo Creek disaster (e.g., Titchener and Kapp, 1976; Gleser et al., 1981), a catastrophe so devastating that the enduring psychosocial reactions of survivors have been labeled the "Buffalo Creek Syndrome" (Titchener and Kapp, 1976, p. 295). Although the evidence from Buffalo Creek is important, some reviews have demonstrated that only Buffalo Creek shows a link between disasters and "severe psychopathologies" (Baisden, 1979, p. 328).

Human-caused disasters appear to be associated with mental health problems more often than natural disasters for a number of reasons. Specifically, in human-caused disasters blame can be assigned; in natural disasters, culpability is much more difficult to establish. Thus, anger at the "callousness and irresponsibility of other humans" (Lifton and Olson, 1976, p. 10), blame assignation, and feelings of being victimized by others are associated with mental health problems among victims and survivors of human-caused events (e.g., Bucher, 1957; Janis, 1951).

A wide range of emotional responses to disasters have been described in the literature dealing with both human-caused and natural events. General fears, anxieties, and tensions are frequently mentioned as common emotional responses (e.g., Taylor et al., 1970; Bates et al., 1963; Blaufarb and Levine, 1972; Bolin, 1982; Richard, 1974; Milne, 1977). Such responses have been reported across a range of disaster types including tornadoes (Taylor, 1977), earthquakes (Greenson and Mintz, 1972), nuclear plant accidents (Houts et al., 1980), hailstorms

(Leivesley, 1977), cyclones and hurricanes (Bates et al., 1963; Parker, 1975), train accidents (Raphael, 1977) and floods (Ollendick and Hoffman, 1982).

One of the classic formulations of psychosocial response to disasters is Wallace's (1956) "disaster syndrome"--a cognitive dysfunction characterized by shocked and dazed behavior. Disaster syndrome as a response to unexpected and severe events is repeatedly mentioned in the sociological literature (e.g., Barton, 1970; Perry and Lindell, 1978), although Kinston and Rosser (1974) suggest that perhaps only 10% of disaster victims develop acute problems requiring intervention. Generally, sociological researchers are more likely than clinical researchers to treat such cognitive disturbances as normal and shortlived (cf., Barton, 1970; Zusman, 1976).

Situational as well as deeper depression is also mentioned in the literature as a relatively common emotional response to impact and loss (e.g., Taylor, 1976). Severe or prolonged disasters appear to be linked to more severe depression (e.g., Hocking, 1970; Knaus, 1975; Leivesley, 1977).

Psychosomatic and physical health problems are typically reported after many disasters (e.g., Logue et al., 1981), and sleep disturbances are a common reaction reported by a number of researchers (Flynn and Chalmers, 1980; Bolin, 1982; Hocking, 1965; Church, 1974; Price, 1978). General physical illness does not appear to be a long-term consequence of disasters (e.g., Parker, 1977; Melick, 1976).

Disasters also seem to be able to cause a variety of interactive or interpersonal disturbances, and the effects of disasters on family relationships have received much recent attention (Drabek and Key, 1984; Bolin, 1982; Erikson, 1976; Taylor, 1976). Irritability and the inability to get along well with other family members during recovery has been one significant finding (Bolin, 1982; Henderson and Bostock, 1977).

Quarantelli (1979) has also considered "response generated demands"--a concept important to studies of long-term response. He demonstrates that it is important to consider if and how social responses to disasters, almost independent of impact related disruptions, can prolong or even create problems among victims. While the initial physical impacts of disasters can potentially create mental health problems, how the

larger society responds to disasters can create or maintain heightened stress levels that cause psychological and social problems that might not otherwise have occurred. Thus, in the case of major disasters--in particular those requiring large-scale federal intervention, long-term stays in emergency shelters, or relocation--mental health problems are sometimes generated by the demands of recovery (as distinct from the initial traumatic event).

Besides considering various stressors, the vulnerability of different demographic groups to disaster-induced psychological problems must also be considered. Early disaster research (Friedsam, 1961; Moore, 1958) specifically suggested that the elderly were "at risk." However, recent research has indicated that, in fact, the elderly are less likely to require mental health support services than other victims (Bell, 1978; Huerta and Horton, 1978; Bolin and Klenow, 1983; Kilijanek and Drabek, 1979). In a number of studies children have been found to be particularly vulnerable to disaster stress (e.g., Blaufarb and Levine, 1972; Lacey, 1972; Newman, 1976; Kliman, 1976); Flynn and Chalmers (1980) suggest that children are vulnerable because of their lower coping capacities. Similarly, Bolin (1982) found that large families were more subject to emotional problems following disaster, perhaps reflecting the greater number of dependent children. In addition, following severe disasters, researchers have observed separation anxieties (Bolin, 1982; Boyd, 1981; Singer, 1982), phobias, and sleep disturbances among children (Frederic, 1977; Newman, 1976; Perry and Perry, 1959).

While children and large families appear particularly vulnerable to the stresses of disaster, several other demographic groups seem less vulnerable. Those groups include blacks (Gleser et al., 1981), those with higher education levels (Bolin, 1982), those with higher incomes (Bolin, 1982), and those with extensive social support networks (Bolin, 1983; Huerta and Horton, 1978; Lucas, 1969).

Generally speaking, the literature on stress and psychosocial disorder views demographic characteristics as mediators between the stressor and coping responses; such characteristics affect how persons understand and interpret the stressor (Lumsden, 1975) and are also associated with the available coping resources of victims (Gleser et al., 1981). Gleser et al., (1981) in their study of Buffalo Creek found that blacks ex-

perienced lower incidences of psychic trauma than whites. Similarly, they found that children scored high on disruption scales while victims of high socioeconomic status scored low. Such findings are consistent with Bolin's recent research (Bolin, 1984). In addition, some studies show that the relationship between age and stress-caused psychosocial disruption tends to be curvilinear for adults, with younger and older adults scoring lower on psychopathology scales than those of middle age (Kessler, 1979).

Because the demography as well as ethnicity of victims figures prominently in our research, some pertinent studies on class, ethnicity, and mental health should be mentioned. Warheit et al. (1976), for example, found that blacks, females, the poor, and those with low education had the highest rates of depression. However, they also found that race effects disappear when socioeconomic status is controlled, indicating that class was a more significant variable than race. Similarly, Mirowsky and Ross (1980) found Mexican-Americans to suffer less distress than whites. While Mexican-Americans may be distressed by low incomes, some Hispanic cultural factors (family-centeredness, extended kin networks) buffer the stress of poverty (Madsen, 1964; Lomnitz, 1970; Farris and Glenn, 1976). The same however was not found by Mirowsky and Ross (1980) for blacks. With blacks, class status was the predominant factor and not black ethnicity (Gaity and Scott, 1972; see also Antunes et al., 1974; and Dohrenwend, 1966). The importance of race and class as determinants of individual and family disaster response will be examined more thoroughly later.

Long-Term Family Recovery

Several studies of natural disasters have recently focused on the long-term recovery of victim families. Drabek and his colleagues (e.g., Drabek et al., 1975; Erikson, 1976; Drabek and Key, 1984) have produced some of the most sophisticated research on the long-term impacts of natural disasters. One important contribution of their research has been analyses of the types of relationships or linkages that victim families establish in order to obtain recovery aid and resources. They found (Drabek and Key, 1984) that besides relying on internal resources in recovery, victims received aid from extra-familial sources, including extended family, friends, and organizations.

Currently, disaster researchers commonly discuss the "therapeutic community" (Barton, 1970) as a contextual factor in recovery. Therapeutic community refers to the emergence of support and altruistic norms in communities after disasters--a process that facilitates a collective response to disaster. However, just as a community can create a supportive context for family recovery, it can also constrain that recovery. For example, in a study of a community stricken by a massive tornado, Bolin (1982, p. 61) notes that

although elements of the therapeutic community were. . . present, these 'utopian elements' are balanced or. . . negated by the inequities that rapidly manifested themselves in the form of price gouging, unscrupulous contractors, and rapidly rising rents.

In a more theoretical vein, Trainer and Bolin, (1976, p. 288) identify three community-level constraints on family recovery: physical constraints, temporal constraints, and subjective constraints. Physical constraints usually consist of destroyed community facilities and neighborhoods that delay a return to normal daily activities. Temporal constraints involve the time required to carry out routine and recovery-related tasks in the postdisaster environment. Delays in clearing roads and reestablishing transportation, failure to provide public transportation, the necessity to spend significant amounts of time attempting to acquire aid--all reduce the time available for more direct recovery-related activities as well as for nondisaster-related family activities. Subjective constraints include the disruption of a family's sense of the familiar and normal caused by reconstruction activities.

Because the community constitutes an important frame of reference for disaster victims, disrupted services and altered community patterns occurring simultaneously with the other serious demands of a disaster can contribute to overall victim stress and inhibit recovery. Furthermore, communities may be transformed in the reconstruction process through changes in their geography and physical layout, relocation of neighborhoods, relocation of business districts, and so on. As noted, these recovery-generated disruptions can generate long-term sociocultural transformations which undermine the sense of well-being. (e.g., Dudasik, 1980; Trainer and Bolin, 1976).

Communities as a complex social whole constitute symbolic objects providing orientation for residents (Hunter, 1974, 1975; Fried, 1966) and are the basis of residents' cognitive maps (Suttles, 1972; Trainer and Bolin, 1976). These mental maps render the local community familiar, safe, and readily accessible to those who reside there. Beyond this, residents identify with their communities and, in so doing, form part of their concept of themselves (Hunter, 1974). Cognitive identity with the community is likely to increase with length of residence and with participation in local activities and organizations (Bell and Newby, 1971). Because disasters disrupt residents' sense of spatial organization and identity with the community, social and behavioral problems may follow (e.g., Barkun, 1974; Hogg, 1980). Thus, disasters not only result in a disruption of expected services but also tend to sever the social ties many victims have to the locale--ties which may provide important psychological support in times of stress. Trainer and Bolin (1976, p. 280) state that after disasters, ties with "voluntary associations, churches and recreational groups may. . . have to be reestablished after the period of concentration on immediate emergency and recovery activities."

Further, they note that (p. 280)

social activities will be disrupted due to the relocation of families and to the destruction of the physical facilities for the various activities. Other activities may be disrupted not a direct consequence of the disaster, but rather due to changes in the physical setting during and after reconstruction. Reconstructed communities seldom are identical to their pre-disaster form. Spatial relocation of activities not only affects those directly impacted by the disaster, but others in the community as well. . . . The complexities of social life may be disturbed for periods extending beyond to actual physical reconstruction of the community.

Although the focus of this research is on the long-term recovery of minorities, little previous disaster research has focused on these groups at any stage of disaster impact or recovery. Of the research available, a good deal examines the effect of race and ethnicity on warning response and evacuation behaviors (e.g., Lindell et al., 1980; Perry et al., 1980). The effect of the mass media on disaster response in a black community has also recently been analyzed by Beady and Bolin (1983).

It is more difficult to find research on ethnic minorities in the

recovery stages of a disaster. Moore (1958), in a study of the effects of tornadoes on several Texas towns, did have some black and Hispanic victims as part of his sample. In general, he found blacks to have suffered greater losses proportionally than others and, consequently, suggested that they had greater need for external resources to facilitate recovery.

In another study of a tornado in Texas, Minnis and McWilliams (1971) examined changing patterns of residential segregation. The Lubbock tornado that they examined disrupted existing housing patterns, and in the aftermath, some neighborhoods became somewhat more racially integrated. The researchers examined victim tolerance of this changing neighborhood composition, finding that blacks were more tolerant of integration than were whites (pp. 169-170).

Much of the literature useful for understanding black recovery from disaster comes not from the disaster literature, but from research on the black family. Research on minority families has examined the role of social support among blacks (e.g., Martin and Martin, 1978; Lin et al., 1979; Lopata, 1978) and reliance on kinship networks during times of stress such as unemployment. Staples (1976) reports that American blacks are more likely to have extensive and cohesive kinship networks and are likely to rely on those networks under stressful circumstances (e.g., Babchuck and Ballweg, 1971; Cantor, 1979; Jackson, 1971; McAdoo, 1978). Stress due to events such as unemployment or desertion is analogous to stress caused by disaster. Hence reliance on social support by minorities may be expected following disasters and may be an important part of the long-term recovery process of minority families.

Bolin (1984) found that for black disaster victims, primary group aid appeared as a negative factor in economic recovery; the primary group was not a useful source of economic aid. He also notes that blacks were frequently unable to qualify for certain governmental recovery programs--an issue that will be examined in more detail later. Nonetheless, it was found that social support of black victims did contribute to their emotional recovery.

Bolin's research has also examined long-term recovery of tornado victims and included a comparative analysis of rural and urban victims, as well as a similar comparison of the elderly and non-elderly (Bolin and

Klenow, 1983). Other research by Bolin (1982) on the long-term recovery of families is directly relevant to the current research. Indeed, instrumentation as well as the general theoretical orientation of the present study follows closely that of the earlier work. For this reason, some key findings regarding differential impacts of the disaster as well as Bolin's multivariate model of family recovery will be reviewed. It was found that elderly victims were more likely to experience a long-term decline in their standard of living than others, but that older victims experienced fewer disaster-related strains in family relationships and were less likely to express anxiety over future disasters. The elderly tended to "underutilize" federal aid programs (particularly SBA), as did lower socioeconomic status victims. Social class was also found to be a determinant in the use of FEMA trailers--victims of lower socioeconomic class being more likely than others to live in them as temporary shelter. Lower socioeconomic status victims, younger victims, and those with large numbers of dependents were each more likely to receive money from Individual Family Grant programs. Bolin also reported that rural disaster victims tended to receive less aid from fewer sources than did urban victims, a factor that slowed rural victims' recovery.

In summarizing recovery outcomes of the disaster victims, Bolin (1982, p. 240) reports:

- 1) Elderly and rural victims were relatively slower in their economic recovery.
- 2) Elderly victims scored higher on the emotional recovery index than others.
- 3) Large families (containing more than 3 dependents) were slower in both their emotional and economic recovery.
4. Most victims, irrespective of age, disaster losses, income, or family size were likely to evaluate the recovery aid they received as inadequate.

In modeling the recovery process, Bolin defined a combination of socioeconomic and impact variables. Interacting with aid, social disruption and social support were shown to be factors determining emotional and economic recovery outcomes (Bolin, 1982; see also Bolton, 1979; Bolin, 1976; Drabek and Key, 1984).

Bolin and Bolton (1983) tested a model of the recovery process in a comparison of family recovery in Latin America and the United States. Their model was similar to that just described with the important addition that this one was cross-cultural; their analysis highlighted differences in response and recovery strategies that were attributable to culture. Features of Latin American culture that affected recovery were the strong familial ties and the patronage system in which personal obligations rather than universal rules determined access to recovery resources. Thus in Latin America continuity of employment (as a result of patronage) was an important determinant of recovery, while in the U.S., aid from governmental sources was a key factor in recovery.

In general, the purpose of models of the recovery process is to develop an understanding of the interplay of factors affecting recovery outcomes. In the present research the concern is with the effect of the race/ethnicity of the victims. Previous research has already shown (Bolin, 1982; Drabek and Key, 1984; Bolin and Bolton, 1983) that the availability and utilization of extra-familial aid and disaster insurance are important determinants of recovery outcomes. As Bolin (1982, p. 241-242) has written, "[T]he determinants of family recovery are many and varied: recovery is the outcome of family [demographic] characteristics, social support networks, aid programs and insurances. . ." Recovery has also been shown to be influenced by disaster impacts and losses--both of a material and personal (injuries/deaths) sort (Bolin, 1982).

In this study, a general model of the recovery process is used as a guide to analysis of the data. In the model, recovery is viewed as the outcome of predisaster conditions and characteristics interacting with disaster impacts and losses. These disaster effects create specific factors and processes during recovery (e.g., obtaining recovery aid), and all factors interplay to determine recovery outcomes. In this analysis, predisaster conditions and characteristics include socioeconomic status, age of family members, family size, race/ethnicity, and related background characteristics. Impacts/losses include material losses to home, home contents, and vehicles; personal losses including injuries to family members, deaths of family members or friends; psychological impacts (bereavement, anxiety, etc.); disruption of family lifestyle and living patterns. Recovery involves such factors and processes as utilizing

support networks, obtaining organizational aid, settling insurance claims, living in temporary housing, relocating residences, and resolving psychological impacts. Recovery has been measured along a number of dimensions (cf., Bolin, 1982; Bolin and Bolton, 1983; Drabek and Key, 1984), but the essential dimensions considered here are economic and emotional recovery. For our purposes economic recovery is measured subjectively by asking respondents to evaluate whether they feel they have recovered economically from the effects of the disaster. Similarly, emotional recovery is a subjective evaluation by victims that feel they are "over" the emotional impacts of their disaster experiences. In the chapters that follow, differences in recovery will be considered, focusing on patterns of aid utilization and ethnicity/race as key elements determining recovery outcomes. In the final chapter, differences among sites will be evaluated comparatively.

CHAPTER III

THE PARIS, TEXAS TORNADO

Introduction

On April 2, 1982, a tornado touched down outside of Paris, Texas and proceeded eastward through the city, tearing apart neighborhoods, killing and injuring many people, and leaving hundreds of others homeless. With that event, the lives of many persons were ineluctably changed, and a complex array of social responses was begun. In this chapter, the nature of the response and recovery of victim families in Paris will be analyzed. The tornado devastated both black and white neighborhoods and thus afforded a unique opportunity for comparing the recovery processes of two racial groups.

Research Design and Implementation

Three factors made Paris a good site for the purposes of this research. First, there were almost equal numbers of black and white victims. Secondly, the tornado was so severe that there was a large pool of victims who suffered moderate to serious losses from which to draw a sample. Finally, the site was declared a disaster by the President, thereby insuring the presence of federal disaster organizations in addition to the many local, state, and independent organizations.

Family surveys began in mid-December--eight months after the tornado's impact. To ensure an adequate sample from among those residents with destroyed homes and those with major damage, a goal was established to interview approximately 400 families, or about 25% of the 1530 families reported by the Red Cross to be affected. Approximately equal numbers of black and white respondents were interviewed across a range of disaster loss levels, and in the end, a total of 431 victims (28.2%) were interviewed.

Surveys were administered to one adult family member in each household selected for interview. Interview schedules contained 178 questions, measuring 340 variables. The instrument utilized in the Paris survey is virtually identical in form and content to the surveys used at the other research sites--the only differences being those required by site-specific concerns (disaster agent, local socio-cultural forms, etc.)

Interview schedules sought information on a wide variety of family

demographic characteristics including: age and sex composition, size, type, residential history, and income, education, occupation, and marital status of heads of household and respondents. The schedules also contained a number of Lickert scale attitude items, scaled from strongly agree to strongly disagree, that presented respondents with statements describing typical disaster-related impacts. Responses to these items could indicate a range of psychological, emotional, economic, social, and family-related disruptions. Another series of questions elicited information on physical impacts, such as injuries, deaths, property and financial losses, as well as on emergency period activities, and aid determination, utilization, and adequacy. The importance of aid in emotional and economic recovery was also recorded. Additional questions were asked regarding various aspects of insurance coverage and regarding victim experiences while living in FEMA mobile homes. Finally, respondents were asked a series of questions designed to assess the level of their emotional and economic recovery, and to determine additional opinions on aid programs, reconstruction activities within their neighborhoods, and officials' handling of the disaster and its aftermath.

In addition to the family interviews, city, state, federal, and nongovernmental disaster relief organization officials were interviewed to obtain general background information on the tornado and its aftermath. Newspaper accounts and other published sources of information were also used to develop the chronology presented below. Interviews with officials were conducted two months prior to the family interviews, and follow-up interviews were conducted at the time of those interviews.

After receiving training, eighteen persons, recruited from local organizations and a local junior college, conducted the actual interviews under the supervision of a field director. The survey was publicized in the community in several ways. The two local newspapers ran press releases on the survey two months prior to and again at the actual time of the interviews, and one radio station ran periodic press releases during the field work. The city manager, the police department, the mayor, disaster relief agencies and organizations, and local community leaders were informed of the survey when interviewing began.

Paris: A Chronology of the Disaster

At 9:15 a.m. on Friday, April 2, 1982, the National Weather Service issued a tornado warning for portions of north central and northeast Texas. This warning was to expire at 3:00 p.m., but severe weather continued and the warning was extended to 9:00 p.m. Therefore, at 3:00 p.m. a watch was in effect for Lamar County, of which Paris is the county seat. It was not until approximately 4:10 p.m. that a tornado (or perhaps a pair of tornadoes) was sighted moving toward Paris. The tornado traveled eastward through the northern part of the city, bypassing the central business district but hitting two residential neighborhoods--an older neighborhood in the northwest and a newer neighborhood in the northeast. The southern section of the city was left virtually untouched.

The tornado cut a swath of destruction approximately five miles long through the city. Although the funnel cloud was estimated to be about 200 yards wide at the ground, its accompanying heavy winds damaged property across a half-mile wide strip. The tornado traveled at approximately 50 miles an hour and stayed on the ground for 20 to 30 minutes.

According to the Red Cross, 11 people were killed. Of these, four were in mobile homes, and five were persons 65 years old or older. A total of 322 people were injured, 59 of whom were admitted to area hospitals.

Immediately following the storm, the Red Cross conducted a "windshield survey"--a house-to-house, street-by-street survey delineating the total area affected and the amount of damage sustained. They found that 426 houses, two mobile homes, and 130 apartments sustained major damage; and 519 houses, and 122 apartments sustained minor damage. In addition, a number of small businesses and six churches sustained various levels of damage. Two larger businesses, the American Box Company and the Paris Lumber Company, were totally destroyed. Total damages were estimated to be in excess of \$50 million.

A total of 1530 families were affected by the tornado through injury, death, or property loss or damage. Of the city's 26,000 residents, nearly 10% were left homeless. Approximately 3,000 residences were without electrical power for at least 24 hours, and thereafter electrical service was only restored piece-by-piece in the disaster area. Gas ser-

vice for 400 to 500 houses was damaged or interrupted by the storm but was generally brought under control within 24 hours. Phone service was interrupted for some 3,000 to 4,000 residents, although most phone service was also restored within 24 hours. In addition, water service ceased briefly due to loss of power at a pumping station.

The city's emergency warning system was put into operation despite recent disagreement on its design. A year prior to the disaster, the city council turned down a proposal to install fixed warning sirens, and a new system was scheduled to be voted upon again by the council. The system that was in effect utilized police, fire, sheriff, and ambulance vehicles stationed around the city. At about 3:30 p.m. on the day of the disaster, after the National Weather Service had confirmed the existence of a tornado, those vehicles traveled up and down the streets of the town sounding their sirens. Although city officials maintained that their emergency plan worked well, at budget hearings in June of 1982, a fixed warning system was approved.

The city of Paris had an emergency management plan, and its coordinator set up an emergency operations center in the police department building the evening of the disaster. At the same time, the Texas Department of Public Safety requested assistance from the National Guard, and these two groups, along with the city's police department, established security procedures for the disaster zone. The city council met in an emergency meeting and instituted a 10:00 p.m. curfew for one week for the area affected by the disaster. A pass system to the disaster area was also put into effect.

Additional emergency vehicles and aid came from Oklahoma and parts of northeast Texas. Dallas and surrounding areas sent 60 paramedic teams which participated in search and rescue operations. On April 2, the Red Cross set up two emergency shelters in the cafeterias of two public schools. However, most victims probably sought emergency shelter with family and friends not affected by the disaster. Only a few victims utilized the Red Cross shelters, and one shelter was subsequently closed. The Salvation Army did take in about 40 victims the night of the disaster.

On April 8th, Paris and Lamar County were declared disaster areas by the federal government, making disaster relief programs available to

residents. These programs included temporary housing, low-interest SBA loans to repair or replace uninsured homes and businesses, and other forms of individual and community assistance. On April 10th, two disaster assistance centers (DACs) were set up to provide one-stop assistance to victims seeking federal, state, and nongovernmental aid and services. The DACs were closed by April 15th, although applications continued to be taken at the local FEMA headquarters. By April 27th, 84 mobile homes and four travel trailers were in place, providing temporary housing. Since local restrictions prohibited the placing of mobile homes on private lots, mobile homes were placed in temporary FEMA courts. However, travel trailers were allowed on private lots where home rebuilding was taking place. In addition to mobile homes, other temporary housing assistance was provided by FEMA which placed 299 families in rental houses and apartments and provided monetary assistance to victims staying with family and friends. By May 27th, 90% of all eligible applicants were housed in temporary or permanent residences.

After the initial emergency period, new assistance organizations came forward, and those already engaged in emergency assistance redirected their efforts to longer-range assistance and community restoration programs. FEMA began searching for permanent housing for those families in temporary shelter. Eligible families were guaranteed three months temporary housing assistance, after which they had to be recertified for housing every 30 days. By September 22, 123 families out of the 387 placed by FEMA in temporary housing were still in need of permanent housing. Low-income families proved particularly difficult to place, because low-income rental units were scarce. Many families had to wait until rebuilt units became available in a tornado-damaged housing complex. By the time of the survey interviews, most families had found permanent housing, with only the most difficult to place remaining in FEMA mobile homes and rental housing. By December 31, 1982 all FEMA mobile homes and travel trailers had been removed from Paris, and FEMA's local operations were closed.

Approximately a week after the disaster, the curfew for the stricken area was lifted. Debris removal and cleanup, conducted by the city with partial funding from FEMA and the assistance of a local army reserve construction unit, began soon after search and rescue operations were

completed. Utility and street repair--partially funded by a Community Development Block Grant project--was conducted by the Department of Public Works. The block grant also aided in the repair and rebuilding of low-income and substandard housing and rental units. The city council used the building permit process to prevent price gouging by unscrupulous contractors attempting to take advantage of home owners anxious to rebuild their homes. In addition to these activities, the city approved the fixed disaster warning system as well as a warning system utilizing local cable television. Moreover, other facets of the city's emergency response program were reviewed, modified, and expanded.

Initially, Red Cross aid was limited to the provision of food and shelter. While the organization continued to provide meals to victims, staff, and volunteers working in the cleanup, it subsequently expanded its efforts, and, on April 5th, opened two centers to provide direct assistance to victim families. This aid was accomplished by setting up a line of credit with local merchants for necessities, such as beds, clothing, shoes, cooking and eating utensils, and first month's rent. In addition, workers at the centers compiled case records containing information such as family data, sustained damage, injuries, property ownership, insurance, assets, and employment.

On April 16th, the Red Cross was notified that the FEMA mobile homes would not be available for purchase by victims. From case records, the organization had identified 305 low-income and elderly families whose homes had sustained major or total damage. It was therefore decided to enter an Additional Assistance Phase in which aid is provided for such things as rebuilding, repair, medical bills, furnishings, appliances, prescriptions, and occupational supplies. During this phase, the Red Cross assisted in rebuilding 30 houses, funded major repairs of three other homes, bought two houses and two trailers, and funded numerous other lesser home repairs. Their repair and rebuilding efforts were made available primarily to low-income and elderly home owners. They were not able to aid renters to any great extent, but they did expand their assistance to include victims outside of the declared area. The Red Cross was assisted by work crews from other disaster relief organizations, including the Mennonite Disaster Service and Christian Public Service. By September, the Red Cross had served over 68,000 meals and assisted 1103

families with medical care. The Red Cross Disaster Headquarters was closed in Paris on September 24th, and personnel made only intermittent site visits thereafter. It is estimated that the Red Cross spent over one million dollars in assisting families in Lamar County.

An additional substantial amount of private assistance was provided through the Interfaith Disaster Services (IDS) of Paris and Lamar County. IDS, a nonprofit organization, incorporated during the second week of May as a result of the efforts of Church World Service and IDS officials from Wichita Falls, Texas (which had undergone a major tornado disaster several years earlier). Board members were mostly local ministers, and funding initially came from local churches in Paris and from Church World Services. While the Red Cross did not provide a great deal of aid to renters, IDS did. In comparison to FEMA and the Red Cross, IDS was more flexible in the types of aid it could provide and the people to whom it could be provided. Aid included such things as insulation, apparel, furniture, appliances, and payment of utility bills and/or rent. Although they did not involve themselves in actual house repair and rebuilding, IDS worked closely with the Red Cross in this area, providing goods and services that the Red Cross could not provide. At the time of the survey, IDS anticipated being in operation in Paris until April or May of 1983 and expected to expend about \$500,000 in aid to victims.

By November 1, 1982, approximately 85% of the housing units that were going to be rebuilt or repaired had been. Thus, recovery was well underway in Paris when data collection began.

Findings: Effects of the Disaster

Demographic Comparisons of the Victims

The study sample was divided about equally between white and non-white racial groups, with 49.2% (212) white victims and 50.8% (219) black victims. To assess differences between the two groups, seven characteristics were compared: household income, occupation and education of the head of household, household size, household type, marital status of the respondent, and age of the respondent (see Appendix A, Tables 1-7 for a summary of this data).

There were statistically significant differences between racial groups on all of the characteristics examined except for age of the

respondent. The socioeconomic variables--income, occupation, and education--all showed black victims doing significantly poorer than white victims. The family variables--size, type, and marital status--produced more complex results. The major differences in household size appeared to be in the categories of two-person households and households with five or more members; 37.7% of white households and 20.5% of black households contained two persons. Conversely, 10.4% of white households and 25.1% of black households had five or more members. In light of this finding, it was not surprising to find that the majority of white households did not have young children present (61.3%), while the majority of black households were "childrearing" (37.9%) or "extended" (14.6%). At the time of the tornado, more white victims were married than black victims, while more black victims were single, separated, or widowed. There were no significant differences between racial groups in terms of respondent age, and in general, respondents were concentrated in the 30 to 59 age bracket.

These data indicate that while socioeconomic resources were fewer for black households than for white households, black households had greater social and economic responsibilities; heads of households received less social or economic support from spouses but supported more dependents.

Disaster Impacts and Losses

Damages to homes of respondents (renters and owners) were estimated by the respondents themselves (Appendix A, Tables 8-9). Typically the estimates were originally given to them by insurance adjustors, disaster personnel, or contractors. About one-half of each group reported structural damages of 50% or less. Slightly more white victims (37.7%) than black (33.3%) had their homes completely destroyed.

However, in terms of dollar losses due to house damage, there were significant differences between racial groups, reflecting their different economic conditions; 36.5% of black respondents and 25.3% of white respondents appeared in the lowest category (<\$5,000 damage). Seven percent of black and 15.7% of white respondents reported losses in excess of \$36,000. The average amount lost by black and white victims due to residential damage was \$12,600 and \$17,500 respectively. (These statistics are for owners only.)

One hundred thirty-two respondents rented apartments or houses. Almost half of the black victims were renters, the majority of whom lived in federally subsidized apartment units, whereas only 12.3% of the white victims lived in rental housing.

Percentage of damage to home contents (furnishings, appliances, etc.) also showed some relation to racial group (Appendix A, Table 10). About 28% of the white victims, as opposed to 20% of the black victims, reported total loss of the contents of their homes.

In terms of dollar losses to contents, again there were significant differences between racial groups, with white victims reporting greater losses than black victims (Appendix A, Table 11). Low to middle income families in both racial groups, but especially blacks, were more likely than persons in higher income groups to report high damage levels (Appendix A, Table 12).

Vehicle losses were comparable to losses to house and contents. Of all victims interviewed, 29.2% had cars and other vehicles destroyed or damaged to the point that they could not be used. Comparatively, 37.3% of white victims and 22.2% of black victims lost at least one vehicle, and white victims lost a greater number of vehicles, with 12.2% of white victims and only 2.3% of black victims losing two or more vehicles. In terms of monetary loss, white victims had an average loss of \$4,400 and black victims an average loss of \$2,600.

Respondents were also asked if they lost mementos or personal possessions that had high personal value. Of the entire sample, 42.7% reported such losses--45.8% of white victims and 39.7% of black victims. Victims were also asked to subjectively compare their losses to those of victims around them. Among white respondents, 72% considered themselves better off, 17.1% about the same, and 10.9% worse off than other victims. Among black respondents, 54.8% considered themselves better off, 27.9% about the same, and 17.4% worse off. Even though white victims experienced greater losses in absolute amounts, it appears that black victims experienced a greater sense of deprivation.

Several categories were examined regarding personal injury: deaths and injuries to co-resident family members; injuries to relatives, friends, and neighbors; deaths among primary group members; and the impact of deaths on the emotional well-being of victim families. The

literature suggests that both injuries and deaths within the co-residential family and among relatives, friends, and neighbors tend to have negative psychosocial impacts on families (e.b., Bolin, 1984; Gleser et al., 1981).

Approximately 21% of the population in the impact zone were injured, and of those injured, 18% required hospitalization. Eleven people were killed. A little over 12% of white households and 8% of black households had at least one family member injured, while only 1.9% of white households and 1.4% of black households had two or more members injured. There were two family members killed in the study sample, and both were from black households.

Since Paris is a small and rather isolated community with a stable population, a large proportion of those sampled--about half--had close relatives, friends, and neighbors injured or killed in the storm. In comparing the number of injuries within primary group categories (Appendix A, Table 13), it appears that differences between racial groups were only significant for the number of friends injured, with twice as many black victims as whites reporting injuries to friends.

Although only 11 deaths resulted from the Paris tornado, a large proportion of those sampled knew and felt close to those killed (Appendix A, Table 14), perhaps indicating the closeness of the community. As with the injury data, the only significant difference between racial groups was for reported loss of friends, significantly more blacks reporting such loss.

In comparing the emotional effects of deaths across racial groups, there were no significant differences except for those who had relatives killed (Appendix A, Table 15). Among white victims, those who had relatives killed were less likely than those with no kin deaths to be completely recovered eight months after the disaster. Contrary to expectations, black victims showed no similar effect. It may be that in the black community, kin deaths foster communal support which in turn may facilitate higher recovery rates. On the other hand, white victims may be expected to deal with the loss of kin on a more individual basis, retarding the recovery process.

Residential Dislocations

In Paris, the tornado entered the city from the west, touching down

in older neighborhoods. In general, these neighborhoods were composed primarily of one-family, wood-frame houses. A large percentage of the residents were poor, working class families. Since the houses in the older neighborhoods were of a more fragile construction, many were leveled by the storm. A federally subsidized housing project, also located on the west side of town, was hit by the tornado and heavily damaged.

Moving eastward through the northern part of the city, the tornado next struck a mobile home park and a middle-class, suburban-type neighborhood. The mobile home park was totally destroyed. Even though the houses in the middle class neighborhood were new and typically of brick construction, those in the storm's direct path were destroyed. Many others had their roofs blown away, leaving them uninhabitable. The central business district and the south side of the city were not touched. The families with destroyed or uninhabitable homes had to find immediate emergency shelter and then longer-term temporary housing until their homes could be repaired or replaced, or new permanent housing could be found.

Of those sampled, 65.7% had to make a least one residential change as a result of the tornado, and white families moved somewhat more often than black families. Of white families, 36.3% moved at least twice and 30.2% moved three or more times prior to establishing a permanent residence. For black families, 37.9% moved at least twice and 20.1% moved three or more times. When interviewing took place approximately eight months after the storm, 13.5% of the total sample--20% of the black respondents and 7% of white--were still living in temporary housing. The relationships by race of several independent variables to the number of residential changes were also examined (Appendix A, Table 16). As expected, those victims experiencing high loss levels moved more often than those with moderate damage; at both high and moderate damage levels, white families moved more often than black families. Higher income seems to permit families to make more frequent moves to find satisfactory permanent housing; for both racial groups, victims with high income moved more frequently than those with lower incomes, although in lower income levels white families moved slightly more often than blacks. Age was also related to the number of residential changes, with young families of

both racial groups moving more frequently than older families; younger white families moved more frequently than blacks in the same age category.

An emergency shelter was set up by the Red Cross in an elementary school on the northeast side of the city, although no one in the sample stayed overnight there. This failure to use the shelter may have been due to its location and to the general reluctance of many victims to use public shelters. Although the shelter was located in the midst of the middle-class neighborhood affected by the tornado, it was some distance from the older northwest neighborhood also damaged. In addition, since only part of the city was stricken, emergency shelter could be had at the homes of friend and relatives not involved in the disaster. Of the 284 families who had to leave their homes, 69.7% went to the homes of relatives for emergency shelter (with no significant differences between racial groups). In addition, 9.6% of white families and 13.0% of black families went to the homes of friends. Others, in both racial groups, went to motels, camped, stayed in recreational vehicles, or remained in their damaged homes until longer-term housing became available.

For victims staying with relatives or friends, longer-term housing was often an extension of their temporary shelter arrangements. FEMA provided compensation for those who housed victims; each victim family (regardless of size) staying with relatives or friends was given \$250 per month with which they could reimburse their hosts for expenses incurred during their stay. At the time of interviews, the exact number of victim families receiving this assistance was not available, but of those sampled, 242 families said that they stayed with relatives or friends at some time since the tornado. Among white victims, 57.5% stayed with relatives or friends, and 31.1% of those received compensation from FEMA for their stay. For black victims, 54.8% stayed with relatives or friends, and 50.8% of those received FEMA compensation. For victims staying with relatives and friends, 97.2% of whites and 85.1% of blacks were satisfied with the amount of aid they received.

Other families utilized a variety of longer-term housing, such as mobile homes, apartments, rental houses, and purchased homes. In comparing longer-term housing arrangements across racial groups, white victims purchased homes more frequently than blacks, while black victims tended

to rent more than whites. According to FEMA reports, 391 families were eligible for temporary housing assistance and 387 were actually assisted. Of these, 299 were placed in houses or apartments, 84 in mobile homes, and four in small travel trailers. Since city regulations did not allow mobile homes on private lots, two FEMA mobile home parks were established (see Bolin, 1982, for a discussion of a similar situation). One park was located on the east side of the city in a privately-owned mobile home park and the other in destroyed neighborhoods on the northwest side of the city. Of the 35 families in the sample that lived in FEMA mobile homes, 22.9% were white and 77.1% were black.

The frequency of residential changes may be expected to have emotional/psychological effects on families, and several of these effects were examined (Appendix A, Table 17). Among white victims, the number of postdisaster moves was related to reduced leisure time, continued storm-related upsets (distress and anxiety), and strained family relationships. Among black victims, the frequency of postdisaster moves did not effect leisure time, but did have a negative impact on family relationships and a particularly strong effect on persistent, continued storm-related upsets. In comparing the perceived disruptive effects of residential changes between racial groups (Appendix A, Table 18), it is clear that black victims felt that their residential changes were significantly more disruptive than did white victims.

While much family disruption was due to housing changes in the pursuit of a permanent residence, another source of disruption was the construction work involved in repairing damaged residences. Of those sampled, 239 families, or 55.5% said that they had to live in their homes while construction work was in progress. While a plurality of families found the repair work moderately disruptive, a large number found it extremely disruptive (Appendix A, Table 19) (differences due to racial groups were not significant). However, in comparing the disruption from repair work to that due to residential changes, it is clear that residential change had a much greater impact on families, particularly for blacks.

Reported visitation patterns before the tornado and those eight months after the tornado were also studied (Appendix A, Table 20). They were approximately the same for both racial groups before the tornado,

and the tornado and the degree of damage it caused appears to have had no effect on visitation with kin, close friends, or neighbors. It should be noted that in general white respondents appeared to have larger available social support networks. For example, whites reported an average of 15 close friends while blacks averaged nine. While both groups averaged the same number of close neighbors (four), whites had an average of eight close kin in town, while blacks had six.

Economic Impacts

Victims were asked if their standard of living had changed as a result of the tornado. In comparing racial groups (Appendix A, Table 21), 20% more black families than white reported a drop in their standard of living. Understandably, when amount of damage was controlled, those in both racial groups with high damage levels were more likely than those with moderate damage to report a decline, and a higher percentage of black victims than white victims at both damage levels reported a drop. The greatest difference between the racial groups was at the moderate damage levels, with almost four times as many blacks as whites reporting a decrease.

Controlling for age of the respondent did not alter the fact that the tornado had greater economic impact on black families. A higher percentage of black victims than white in both age categories indicated that their standard of living had gone down since the tornado. Although a greater percentage of older white victims than younger white victims reported such a drop, the difference was not large. A significantly greater percentage of young blacks than older blacks reported a drop in their standard of living. Thus, among all racial/age groups, it appears that the standard of living of young black families was most affected by the tornado.

Respondents were also asked if their economic condition had changed since the tornado. Responses show a similar pattern of differences between racial groups as those regarding the standard of living. Of white families, 65.6% felt that their economic situation had returned to its pre-storm condition, and 34.4% either weren't sure or said it had worsened. By contrast, 49.3% of black families felt that their economic condition was the same as before the storm and 50.7% said they were worse off.

An economic condition that may affect families after a disaster is inflation in prices, caused in part by the strong demand put on goods and services and in part by exploitation by some businesses. To examine this effect, respondents were asked if increased prices had affected their financial recovery from the storm (Appendix A, Table 22). Here again black families felt a greater economic impact than white families; almost 23% more black families felt that their financial recovery had been impaired due to rising prices. In addition, using an indicator of increased costs of living, 26.6% more black families than white reported that since the tornado, their living expenses had risen. Significantly more black families than white also reported an increase in the cost of their housing, although changes in living expenses appear to have had greater impact on black families than the housing costs.

Since most industries in Paris are located on its perimeters and the central business district was not in the tornado's path, business activities were not severely disrupted for any length of time. Correspondingly most respondents in Paris did not report unemployment due to the storm's impact on business. While some victims found themselves forced into unemployment after the disaster, others obtained new or additional jobs to help cover losses that were not covered by aid and insurance. In Paris, the percentage of families getting new or additional jobs was small, perhaps due to the recession during the aftermath of the tornado and lack of extra job opportunities.

Impacts on Family Functioning

Disasters may have positive as well as negative effects on family relationships and functioning. Families may gain strength from confronting the external challenge; however, they may also be weakened by the constant stress and tension created by a disaster, particularly if the family was only weakly bonded prior to the event (Drabek and Key, 1984). In addition, the task of restoring losses and damaged property is time consuming and can result in less time available for family recreational and emotional needs. Several indicators were used to assess family disruption. These included self-reports of "upsets" with storm related events, feelings of pressure due to time constraints, lack of patience with others, and strains in family relationships (Appendix A, Table 23).

At the time of the survey, a clear majority of all respondents,

61.3%, were still feeling family disruptions due to the storm; moreover, significantly more black than white families reported continuing "upsets." Another stress examined was the feeling of temporal pressure to "get things back to normal". Again, more black than white victims felt this pressure (49.7% versus 45.3%), although the difference between racial groups was not as great as with storm-related upsets. Similarly, black victims were more likely to report impatience with other family members due to overwork caused by the disaster (42.9% versus 32.1%).

When asked to assess general strains on family relationships caused by the tornado, 15.7% more black than white families indicated such strains. This effect was further analyzed by damage level and age of victim (Appendix A, Table 24). Strained family relationships were clearly related to damage levels for white families, but only slightly related for black families. When the effect of age was examined, more black families in all age groups reported such strain; and in both racial groups, significantly more young than elderly families experienced this effect. Other research has similarly revealed that elderly victims seem less likely to experience psychosocial disturbances than others (see, for example, Kilijanek and Drabek, 1979; Bolin and Klenow, 1983). Thus, overall, it is clear that more black than white families were negatively affected by the disaster.

However, if disasters disrupt family relationships, they may also have positive effects. Three indicators of possible positive changes were examined: perception of strengthened family ties, value changes regarding material possessions, and happiness levels (Appendix A, Table 23).

When victims were asked if they thought "family ties were strengthened" by the disaster, most responded affirmatively. Similarly, there was a feeling that material possessions had become less important as the value of personal relationships had been highlighted by the crisis. These first two indicators of family strength are embedded in the traditional American ideology that families should pull together in times of need and that "people" should be more important than "things." When asked if levels of family happiness had changed since the tornado, a minority of white families (24.7%) and a significantly smaller percentage of black families (19.6%) said they found family life happier.

It appears that the experience of the tornado did have some positive impacts, although they were not as pervasive and significant as the negative ones. In comparing racial groups, it also appears that more black than white families were affected negatively, reinforcing the pattern of greater victimization of blacks.

Another impact on families is the disruption of daily routines, including loss of leisure time, loss of and change in recreational activities, and loss and disruption of time due to injuries and psychosocial problems (Trainer and Bolin, 1976). As might be expected, 14.9% more black than white families experienced such changes in family routines (Appendix A, Table 25). When damage levels were controlled, moderate damage level families in both racial groups were more likely to have reported disruptions than those who experienced higher damage. However, the percentage difference was substantially greater for white than black families. Among white victims, there was little difference in family disruption between age groups; all black age groups reported a higher percentage of family disruption than the corresponding white groups, and younger black families experienced significantly more disruption than older ones.

Satisfaction with housing is important to family stability and well-being. Overcrowding in a new living space, displacement from a familiar neighborhood, grief over a lost home, and displeasure with new or temporary housing may cause family tension and conflict. Respondents were asked to compare their current housing with pre-tornado housing (Appendix A, Table 26). A majority of respondents agreed that their current housing was as nice as that before the tornado. However, 13.9% more white than black families said they were satisfied with that housing. A much smaller percentage (approximately one-third) of both racial groups felt that their current housing was better built or safer than their pre-tornado housing, with slightly more white than black families satisfied. Finally, more black than white victims (6.8%) believed that their current housing situation was making it difficult to recover. Again in the area of housing, it appears that more black than white families were negatively impacted by the disaster. Black families were less likely to be satisfied with postdisaster housing in comparison to pre-tornado housing, less satisfied with housing comfort, less satisfied with its

construction and safety, and more likely to feel that housing was a hindrance to their recovery.

The neighborhood is another social context whose disruption may affect the emotional well-being of family members. In Paris, several entire neighborhoods were disrupted by the disaster. Homes and churches were destroyed, and many families were forced to relocate. In addition, those families who remained or were able to return to their neighborhoods were faced with extensive, disruptive construction and cleanup. Victims were asked if this disruption was an impediment to their recovery (Appendix A, Table 27), and the majority indicated it was. When racial groups were compared, 19.1% more blacks than whites said they felt this effect. When victims were asked to compare the general aesthetics of their pre and postdisaster neighborhoods, the majority were not satisfied with the change--the differences between racial groups being particularly large; thirty-one percent more black than white families felt that current neighborhoods were not as pleasant as their predisaster neighborhoods. Among blacks, 74% with high damage and 76% with moderate damage found their present neighborhood environment less pleasant. There were no significant differences in neighborhood satisfaction between age groups for either racial group. Again, black families were found on all measures to be more severely affected by neighborhood disruption than white families.

Psychosocial Impacts

As already demonstrated, disasters can create stress and anxiety in residents not directly affected as well as actual victims. Anxieties may range from nervousness during inclement weather to deep-rooted phobias affecting sleep and dreams (see, for example, Gleser et al., 1981). When respondents were asked if they became nervous with the approach of storm clouds, an overwhelming majority (87.7%) said that they did (Appendix A, Table 28) with virtually no difference between racial groups. When damage levels, age, and family size were considered, the difference between black and white families remained minimal (Appendix A, Table 29). As may be expected, victims with high damage more often reported nervousness in stormy weather than those with moderate damage; however, the percentage difference was slight, particularly among black victims. Younger victims also reported a greater incidence of this kind of anxie-

ty. While the percentage difference among whites was negligible, 9.7% more younger blacks than older reported feeling nervous in stormy weather. Family size was an additional factor correlating with this nervousness; slightly more large than small families were emotionally affected by stormy weather.

Although a large number of respondents reported nervousness, smaller percentages were affected by their disaster experiences to the point that they experienced bad dreams (35.6%) or sleep disturbances (54.6%). The differences between racial groups were small with slightly more blacks experiencing these more severe effects.

To explore the causes of these more severe effects, within each racial group a number of variables were considered: damage level, age group, family size, knowing others killed or injured, having relatives injured, having relatives killed, having friends injured, having friends killed, having neighbors injured, and having neighbors killed. Overall, the differences between racial groups were slight. Among black victims, χ^2 tests of the variables mentioned above indicated that several were significantly related to experiencing bad dreams: knowing others killed or injured; having friends killed; and having neighbors injured. Among white victims, factors significantly related to experiencing bad dreams were: having high damage levels; being a younger rather than older victim; belonging to a larger family; knowing others killed or injured; and having neighbors killed. Thus, the only variable related to bad dreams common to both racial groups was knowing others killed or injured. The incidence of bad dreams among black victims was associated only with deaths and injuries of persons who they knew; whereas those of white victims were also associated with several demographic factors.

Several variables were significantly related to sleeplessness among black victims: knowing others killed or injured; having friends killed; and having neighbors who were injured (the same variables related to bad dreams). Among whites the significant variables were: knowing others killed or injured; and having neighbors killed.

Those surveyed were asked to assess the extent to which their children had been affected emotionally by the storm (Appendix A, Table 28). Most parents agreed (with no significant difference between racial groups) that their children were afraid to be away from their parents

during stormy weather and that they were nervous in stormy weather. In comparing these results with the respondents' self-reports of nervousness in stormy weather, there was a slightly higher proportion of parents who thought that their children were adversely affected by the disaster than there were adults who viewed themselves as affected, possibly demonstrating the added vulnerability of children to such stressors.

A number of variables possibly related to separation anxiety and nervousness in children were examined. Among black victims, separation anxiety was positively related to family size, knowing others killed or injured, and having a friend killed. Among white victims, the only factor significantly associated with separation anxiety in children was family size.

In order to determine and compare feelings of fatalism, a four-question index was used (Appendix A, Table 30). Three of the items deal directly with persons' feelings about fate, and one item, the balancing of bad and good, was used as an indicator of optimism.

In general, black victims were more fatalistic than white victims; differences between racial groups were significant for all but the first item on the scale. Although these findings support those in other sections, it is not possible to determine if such feelings can be attributable solely to the tornado experience, because no data assessing levels of fatalism were gathered prior to the tornado. It is possible that blacks as a group are more fatalistic than whites, irrespective of disaster experiences.

To further explore levels of fatalism, damage levels were taken into account (Appendix A, Table 31). It was expected that victims incurring greater losses would exhibit higher levels of fatalism. While true for white victims, this relationship did not hold for black victims, but instead ran contrary to expectations. Moderate-damage blacks had higher fatalism scores than those with greater losses. However, high-loss blacks expressed significantly lower levels of optimism.

Findings: Aid Utilization and Recovery

A large number of aid programs and services were available to victims in Paris, including several from national agencies and organizations (e.g., FEMA, SBA, Red Cross), and others from the state, local churches,

and local civic organizations. The following discussion is limited to major, widely available programs. Some programs and aid sources were used by so few respondents that sample sizes precluded meaningful analyses.

The federal government provided several services to victims of the tornado, such as a Disaster Assistance Center (DAC) to aid victims in applying for available relief programs, Small Business Administration loans, Farmers Home Administration loans, Internal Revenue Service assistance, and temporary housing provided by FEMA. Most of these services and coordination with other helping agencies were administered through the Denton, Texas, office of FEMA.

The FEMA office in Paris provided temporary housing services and took applications for assistance programs after the DAC was closed. The temporary housing took several forms: subsidized rental homes and apartments, rent-free mobile homes, and financial compensation to families and friends housing disaster victims. Because of this compensation and because a sufficient number of rental properties were available in Paris, only 88 mobile homes were needed as temporary housing. Of those victims interviewed, only 35 utilized these mobile homes. Although FEMA sponsored the Individual and Family Grant Program (IFG), the program was administered by the Texas Department of Human Resources which shared the cost. Additionally, the Army Corps of Engineers aided in debris removal so that rebuilding could be promptly started on family home sites, and the Air Force provided services in rebuilding and repairing homes.

The most widely used program administered by the state was the previously mentioned Individual and Family Grant Program (IFG). IFG provided grants up to \$5,000 to victims who had exhausted all other resources and been turned down for an SBA loan. Although some victims were below the poverty line even before their tornado losses, the IFG was intended to cover only expenses incurred as a result of the disaster. The State of Texas provided several other forms of assistance. For example, the Texas Employment Commission helped process unemployment claim for those who were out of work due to the disaster, and the Department of Human Resources provided food stamps.

Four major national volunteer organizations were present in Paris: the American Red Cross, the Mennonite Disaster Service, the Christian

Public Service, and the Salvation Army. The Red Cross provided a number of forms of assistance in Paris and, among survey respondents, was the most widely used aid source. During its emergency phase, the Red Cross set up a total of five shelters to provide food and shelter and assist with applications for aid. It provided direct assistance to families in the form of credit grants with merchants for necessities such as clothing, beds, shoes, eating and cooking utensils, and rent; and it administered mobile and fixed food services for victims and volunteers.

As mentioned, the Red Cross found it necessary to enter an Additional Assistance Phase, during which it provided assistance for medical bills, home furnishings, appliances, prescriptions, and other supplies. It also provided coordination and some funding of materials for home repair and rebuilding; construction crews were provided by Mennonite Disaster Services and Christian Public Service. In addition, the Red Cross coordinated services and funds of other church groups and local civic organizations.

Under the auspices of Church World Services, Interfaith Disaster Services (IDS) was incorporated in May with funding coming from Church World Services and local churches. IDS provided a variety of services including the payment of back taxes, payment of delinquent utility bills, rent deposits, clothing, furniture, appliances, building materials, food, and trees. IDS worked closely with the Red Cross to provide materials and furnishings for rebuilding and repair that the Red Cross could not provide. The goal of IDS was to take care of those with needs that did not qualify for other aid, or those who might have otherwise "fallen through cracks."

As far as could be determined, no crisis counseling programs were available in Paris, although it appears that crisis counseling was probably an area of great need. Of all those interviewed, 60.1% felt that they had experienced emotional strain due to the storm, and of these, only 13.1%, or 35 victims received any kind of counseling or emotional help. Of the 35 victims who did receive counseling, the majority (24 victims) received their counseling from a professional--a counselor, a doctor, or a social worker. When the need for counseling was compared between racial groups, significantly more white than black victims indicated that they had experienced emotional strain. However,

both racial groups were equally as likely to actually receive counseling. Victims of both racial groups were most likely to go to a professional for counseling. Only small percentages went to the clergy or to others.

Federal Aid

Two primary federal agencies, FEMA and SBA, were studied. Although FEMA offered a range of services and programs to municipal governments and related organizations, our focus is on programs available to individual families--temporary housing, mobile homes, and compensation to family and friends housing victims. Table III-1 presents data on aid program user characteristics for each racial group.

Only a small percentage of the respondents utilized federal aid; 17.4% used FEMA and 4.4% used SBA. In comparing racial groups, differences in utilization rates of SBA were minimal; however, significantly more black than white families used FEMA aid. Although blacks were as likely as whites to obtain SBA loans, the average loan amount to whites (\$19,430) was much higher than that to blacks (\$9,400). Still, very few persons from either group utilized these loans, most likely reflecting the relatively low incomes of respondents, the large number of respondents on fixed incomes and public assistance, and the large number of renters (the first two factors make it difficult to qualify for loans.)

Within both racial groups, significantly more younger than older families utilized FEMA and SBA aid. In addition, more large families utilized aid than did small families, although differences were slight. For example, for temporary housing, large families were more likely than smaller ones to seek help from FEMA rather than to stay with family or friends. Thus, in the main, this greater utilization of aid probably reflects the greater recovery needs of young and/or large families.

Utilization of federal aid was cross-tabulated with income, education, and occupational status, to assess the influence of socioeconomic factors on utilization patterns. Families with moderate incomes in both racial groups were somewhat more likely to use FEMA as an aid source than were those with high incomes, possibly because they had fewer personal resources to contribute to their own recovery. Among white families, those with lower incomes were more likely to get SBA loans, whereas the opposite pattern occurs among black families where significantly more high income blacks got SBA loans. This difference between racial groups

TABLE III-1

RECIPIENTS OF FEDERAL AID		
	THOSE WHO USED:	
	FEDERAL AID (FEMA)	SBA
WHITE VICTIMS n = 212	12.7% (27)	4.7% (10)
BLACK VICTIMS n = 219	21.9% (48)	4.1% (9)
WHITE VICTIMS		
Under 60 years of age n = 131	16.0% (21)	7.6% (10)
60 Years and Older n = 81	7.4% (6)	0.0% (0)
BLACK VICTIMS		
Under 60 years of age n = 136	23.5% (32)	5.9% (8)
60 Years and Older n = 83	19.3% (16)	1.2% (1)
WHITE VICTIMS: FAMILY SIZE		
3 Persons or Less n = 158	10.8% (17)	3.8% (6)
4 or More Persons n = 54	18.5% (10)	7.4% (4)
BLACK VICTIMS: FAMILY SIZE		
3 Persons or Less n = 133	20.3% (27)	3.0% (4)
4 or More Persons n = 86	24.4% (21)	5.8% (5)
WHITE INCOME*		
Moderate Income n = 150	15.3% (23)	6.0% (9)
High Income n = 62	6.5% (4)	1.6% (1)
BLACK INCOME*		
Moderate Income n = 209	23.0% (48)	2.9% (6)
High Income n = 10	0.0% (0)	30.0% (3)
* Income has been categorized as Moderate Income = \$0 - 1,299 per month and High Income equal to \$1,300 per month or higher.		
WHITE VICTIMS: EDUCATION		
12 Yrs. of School or Less n = 148	13.5% (20)	4.7% (7)
More than 12 Yrs. of Educ. n = 62	11.3% (7)	4.8% (3)
BLACK VICTIMS: EDUCATION		
12 Yrs. of School or Less n = 190	22.6% (43)	3.2% (6)
More than 12 Yrs. of Educ. n = 28	17.9% (5)	10.7% (3)

TABLE III-1 (Continued)

	THOSE WHO USED:	
	FEDERAL AID (FEMA)	SBA
WHITE EMPLOYMENT		
White Collar Worker n = 84	8.3% (7)	2.4% (2)
Blue Collar Worker n = 116	15.5% (18)	6.9% (8)
BLACK EMPLOYMENT		
White Collar Worker n = 14	28.6% (4)	7.1% (1)
Blue Collar Worker n = 170	19.4% (33)	4.7% (8)
WHITE DAMAGE LEVELS*		
Moderate Damage n = 132	6.1% (8)	0.8% (1)
High Damage n = 80	23.8% (19)	11.3% (9)
BLACK DAMAGE LEVELS*		
Moderate Damage n = 146	8.9% (13)	3.4% (5)
High Damage n = 73	47.9% (35)	5.5% (4)
* Damage Levels are catagorized as Moderate Damage equal to 0 - 79% damage to house and High Damage as more than 80%.		
WHITE VICTIMS:		
DOLLAR LOSSES		
Moderate Losses to House (Under \$20,000) n = 113	10.6% (12)	2.7% (3)
Heavy Losses to House (\$20,000+) n = 65	15.4% (10)	9.2% (6)
BLACK VICTIMS:		
DOLLAR LOSSES		
Moderate Losses to House (Under \$20,000) n = 86	11.6% (10)	1.2% (1)
Heavy Losses to House (\$20,000+) n = 29	24.1% (7)	13.8% (4)

may be due to the relatively large number of black respondents on fixed incomes and/or living in rental property.

Education levels appear to have no significant relationship to federal aid utilization in either racial group. However, families with heads of household having 12 years of education or less in both racial groups were more likely to use FEMA than those with more education, and among blacks, those with more than 12 years of education were slightly more likely to receive an SBA loan than those with less education.

As with education levels, occupational status appears to have had no significant effect on federal aid utilization in either racial group. Among white families, those with blue collar heads of household received FEMA and SBA aid more often than those with white collar heads of household. The opposite pattern held for black families.

Two independent measures, percent of damage to home and dollar loss to home, were used to examine the effects of loss levels on aid receipt. Consistently, both black and white families with high levels of loss were more likely to use both types of federal aid than those with lower losses. As would be expected, those with higher losses were more likely to exhaust personal resources in recovery and then to turn to formal organizations for additional aid.

In reviewing the demographic, socioeconomic, and disaster loss characteristics in patterns of federal aid utilization, it appears that the factor that has the best predictive validity among both racial groups is disaster loss levels. Further, among specific characteristics, respondent age among white families appears to have good predictive value for the use of federal aid, with young white families more likely to use both types of aid.

Although the use of FEMA mobile homes was discussed previously, additional information is pertinent at this point. Of the 35 families living in FEMA mobile homes, 22.9% were white and 77.1% were black. There were two FEMA mobile home courts. A large court was located in the destroyed black neighborhood, and a smaller one was located in a destroyed commercial mobile home park at the perimeter of the city. Black families were much more likely to live in FEMA trailer courts than to have their FEMA mobile home located on a private lot; 62.5% of white families compared to 92.6% of black families lived in such courts. Among

white families, only 20% of those living in FEMA courts lived near their former homes, while 65.4% of black families did so. The majority of respondents in both racial groups living in FEMA mobile home courts (60% of whites and 85% of blacks) felt that the courts were less pleasant than their old neighborhoods. For both racial groups, most respondents felt that the trailer application form was not difficult to fill out, that the wait to actually get the trailer was reasonable, and that no extra or unanticipated expenses were incurred. When asked to assess the disruption to family life caused by being temporarily housed in FEMA trailers, 75% of both groups reported that it was very disruptive.

Victims who received federal aid (FEMA and/or SBA) were asked to rate the importance of those aid programs in their economic and emotional recovery. Due to the small number of SBA loan recipients among respondents, both aid sources are combined in the following discussion (Table III-2). In all, 53.5% of the victims receiving federal aid rated aid programs very important in their economic recovery, and 40.7% rated them important in their emotional recovery. When racial groups were compared, differences between groups were not significant, although a slightly higher percentage of white than black victims rated aid programs as important.

Other Aid Programs

The utilization of aid from the Red Cross, the Texas Department of Human Resources, Interfaith Disaster Services (IDS), and from other miscellaneous sources such as employee, civic, and charitable organizations (Lions, Elks, etc.) was examined and compared between racial groups (Table III-3).

Of these aid sources, the most widely used was the Red Cross; over half of the respondents said that they had received aid from that organization. Significantly more black than white families had received such aid, and it was found that younger and/or larger families in both racial groups were also more apt to use the Red Cross.

Approximately 25% of the respondents received an Individual and Family Grant from the Texas Department of Human Resources, with significantly more black than white recipients. However, the average grant to black families (\$2,294) was considerably smaller than that to white families (\$3,462). The higher recipient rate among blacks reflects their

TABLE III-2

VICTIM ASSESSMENT OF AID IMPORTANCE FOR FAMILY RECOVERY

<u>FEDERAL AID RECIPIENTS</u>		<u>ECONOMIC RECOVERY</u>	
		<u>NOT IMPORTANT TO MODERATELY IMPORTANT</u>	<u>VERY IMPORTANT</u>
VICTIMS	n = 86	46.5% (40)	53.5% (46)
WHITE VICTIMS	n = 33	42.4% (14)	57.6% (19)
BLACK VICTIMS	n = 53	49.1% (26)	50.9% (27)
		$\chi^2 = 0.14$ Sig. = .706	
		<u>EMOTIONAL RECOVERY</u>	
		<u>NOT IMPORTANT TO MODERATELY IMPORTANT</u>	<u>VERY IMPORTANT</u>
VICTIMS	n = 86	59.3% (51)	40.7% (35)
WHITE VICTIMS	n = 33	57.6% (19)	42.4% (14)
BLACK VICTIMS	n = 53	60.4% (32)	39.6% (21)
		$\chi^2 = 0.0$ Sig. = .975	
<u>OTHER AID RECIPIENTS</u>		<u>ECONOMIC RECOVERY</u>	
		<u>NOT IMPORTANT TO MODERATELY IMPORTANT</u>	<u>VERY IMPORTANT</u>
VICTIMS	n = 256	56.6% (145)	43.4% (111)
WHITE VICTIMS	n = 108	52.8% (57)	47.2% (51)
BLACK VICTIMS	n = 148	59.5% (88)	40.5% (60)
		$\chi^2 = 0.88$ Sig. = .348	
		<u>EMOTIONAL RECOVERY</u>	
		<u>NOT IMPORTANT TO MODERATELY IMPORTANT</u>	<u>VERY IMPORTANT</u>
VICTIMS	n = 256	59.0% (151)	41.0% (105)
WHITE VICTIMS	n = 108	56.5% (61)	43.5% (47)
BLACK VICTIMS	n = 148	60.8% (90)	39.2% (58)
		$\chi^2 = 0.32$ Sig. = .571	

TABLE III-3

RECIPIENTS OF NONFEDERAL AID

	Percent Who Received Aid			
	RED CROSS	IFG*	INTERFAITH**	LOCAL CIVIC*** ORGANIZATION
WHITE VICTIMS	45.3% (96)	17.0% (36)	19.3% (41)	37.3% (79)
BLACK VICTIMS	59.4% (130)	32.9% (72)	37.9% (83)	35.6% (78)
WHITE VICTIMS: AGE				
<60 Yrs. n = 131	48.1% (63)	13.7% (18)	19.1% (25)	38.9% (51)
≥60 Yrs. n = 81	40.7% (33)	22.2% (18)	19.8% (16)	34.6% (28)
BLACK VICTIMS: AGE				
<60 Yrs. n = 136	63.2% (86)	33.8% (46)	41.2% (56)	39.7% (54)
≥60 Yrs. n = 83	53.0% (44)	31.3% (26)	32.5% (27)	28.9% (24)
WHITE VICTIMS: FAMILY SIZE				
≤3 pers n = 158	42.4% (67)	16.5% (26)	17.1% (27)	33.5% (53)
≥4 pers n = 54	53.7% (29)	18.5% (10)	25.9% (14)	48.1% (26)
BLACK VICTIMS: FAMILY SIZE				
≤3 pers n = 133	54.1% (72)	29.3% (39)	34.6% (46)	31.6% (42)
≥4 pers n = 86	67.4% (58)	38.4% (33)	43.0% (37)	41.9% (36)
WHITE VICTIMS: INCOME				
Moderate n = 150	52.7% (79)	22.7% (34)	23.3% (35)	40.7% (61)
High n = 62	27.4% (17)	3.2% (2)	9.7% (6)	20.0% (18)
BLACK VICTIMS: INCOME				
Moderate n = 209	60.3% (126)	34.4% (72)	38.3% (80)	35.4% (74)
High n = 10	40.0% (4)	0.0% (0)	30.0% (3)	40.0% (4)
WHITE VICTIMS: EDUCATION				
High School Grad or Less n = 148	48.0% (71)	21.6% (32)	21.6% (32)	38.5% (57)
College+ n = 62	40.3% (25)	6.5% (4)	14.5% (9)	38.5% (22)
BLACK VICTIMS: EDUCATION				
High School Grad or Less n = 190	58.4% (111)	32.6% (62)	37.4% (71)	34.2% (65)
College+ n = 28	64.3% (18)	32.1% (9)	42.9% (12)	46.4% (13)

(continued)

TABLE III-3 (Continued)

		Percent Who Received Aid			
		RED CROSS	IFG*	INTERFAITH**	LOCAL CIVIC*** ORGANIZATION
WHITE VICTIMS: EMPLOYMENT					
White Collar n = 84		34.5% (29)	3.6% (3)	6.0% (5)	31.0% (26)
Blue Collar n = 116		51.7% (60)	24.1% (28)	30.2% (35)	41.4% (48)
BLACK VICTIMS: EMPLOYMENT					
White Collar n = 14		57.1% (8)	35.7% (5)	21.4% (3)	35.7% (5)
Blue Collar n = 170		58.8% (100)	28.2% (48)	37.1% (63)	32.9% (56)
WHITE VICTIMS: DAMAGE SUFFERED					
Moderate n = 132		28.0% (37)	9.1% (12)	11.4% (15)	25.0% (33)
High n = 80		73.8% (59)	30.0% (24)	32.5% (26)	57.5% (46)
BLACK VICTIMS: DAMAGE SUFFERED					
Moderate n = 132		50.0% (66)	24.0% (32)	31.4% (42)	28.8% (38)
High n = 73		78.1% (57)	50.7% (37)	50.7% (37)	49.3% (36)
WHITE VICTIMS: LOSS IN DOLLARS					
<\$20,000 n = 113		35.4% (40)	17.7% (20)	19.5% (22)	24.8% (28)
≥\$20,000 n = 65		56.9% (37)	13.8% (9)	20.0% (13)	53.8% (35)
BLACK VICTIMS: LOSS IN DOLLARS					
<\$20,000 n = 86		44.2% (38)	20.9% (18)	30.2% (26)	19.8% (17)
≥\$20,000 n = 29		65.5% (19)	34.5% (10)	48.3% (14)	58.6% (17)

*Individual Family Grants

**Interfaith Disaster Services

***Church, Civic, and Miscellaneous Organizations

lower socioeconomic status and their lack of personal resources.

Of all respondents, 28.8% used Interfaith Disaster Services as an aid source, again with significantly greater utilization by black families.

Aid from the miscellaneous sources was the second most frequently used; 36.4% of all respondents reported receiving aid from their employers or local civic organizations. Unlike the utilization of other aid, there were no significant differences between racial groups in the receipt of local aid. However, large families appeared to be more likely to receive local aid than did smaller ones.

Overall, the most consistent demographic characteristic associated with the use of these aid sources was race, with black families significantly more likely to use most nonfederal aid sources. Additionally, among blacks, large family size was associated with increased utilization of the Red Cross, and among whites large family size was similarly associated with the use of local aid.

For all the aid sources considered here, recipients were most likely to be middle income, "blue collar" workers. Associations between socioeconomic status and aid were significant for white families for all sources except local aid, and the same general pattern occurred among black victims, although associations generally were not statistically significant. (This may be due in part to the very small number of high income, "white collar" blacks in the sample. Caution should be used in interpreting the findings for blacks because of this small number.)

The association between the educational background of the head of household and aid source use is more complex. Among white families, those with a high school education or less were more likely to use all four aid sources than those with more education. In contrast, among blacks, slightly more families with some college used these aid sources than those with lower levels of education.

As with federal aid, families in both racial groups with high damage levels were significantly more likely to use state and local aid than those with moderate damage. Indeed, severe damage appears to be one of the most consistent indicators of probable use of nonfederal aid. When damage was estimated in dollar amounts, two associations were significant for both racial groups: high dollar losses and the use of both Red Cross

and local aid.

In addition to the Individual and Family Grant Program, the State of Texas administered a food stamp program for victims. Of the respondents, 22.5% received food stamps through this program. There were no significant differences between racial groups in receiving this aid, although a slightly higher percentage of black families (26%) than white families (18.9%) received food stamps.

Although Mennonite construction aid was widely used by respondents (9.5% of the total respondents received Mennonite aid), this aid was of considerable importance to poor and older families who did not have the financial resources to repair and rebuild their homes otherwise. Among whites, 12.3% said they utilized Mennonite labor, while 6.8% of the black respondents did so.

Because three times as many respondents used these four aid sources as used federal programs, they were important to victim recovery in Paris. Since so few of the respondents obtained SBA loans (particularly the poor and elderly families) many had to rely on aid from nonfederal programs in the repair and rebuilding of homes. In addition to major repairs and rebuilding, these particular aid sources provided living necessities during and after the emergency period, including food, clothing, and household items. The provision of such necessities may have facilitated long-term recovery by helping to alleviate a sense of extreme deprivation which sometimes occur with sudden and heavy losses.

As with federal aid recipients, recipients of aid from nonfederal sources rated the importance of those aid programs in their economic and emotional recovery. These data are presented in Table III-2. Some 43% of nonfederal aid recipients rated those aid programs as very important in their economic recovery. The difference between racial groups was not large, although slightly more white than black families considered them very important. A similar pattern occurred with regard to emotional recovery, with aid programs being less important to emotional than economic recovery.

In comparing the responses of federal aid recipients with those of nonfederal aid, it appears that federal aid recipients rated those programs more important in their economic recovery than did other aid recipients. However, with respect to emotional recovery both federal

nonfederal aid recipients rated aid programs about equally.

Respondents were asked about the ways that they found out about the available disaster aid programs in Paris. Of the 422 respondents who did receive information, the most frequently mentioned source of information was word of mouth. Approximately 70% of all respondents received information in such a manner. The second most often used source of information was from the newspapers which 44% of the respondents used.

There are clear differences between racial groups in the sources of aid information. Black families were significantly more likely than white families to learn about aid programs from the disaster assistance center and from word of mouth. Among black families, 32.5% learned about the aid programs at the DACs, while 21.0% of white families learned about them in this way. Since victims from both racial groups were equally as likely to go to the DACs, the DACs seem to have been an especially important source of information about aid programs for black families. Of the black families, 73% received aid program information by word of mouth, while 61% white families did likewise.

White families were significantly more likely than black families to learn about aid programs from the media. About 38% of white families and 21% of black families received their information from television or radio. Similarly, about 52% of white families and 41.5% of black families reported reading about aid programs in the newspapers. Only small numbers of respondents used information sources such as posters, clergy, disaster volunteers, the Red Cross, Salvation Army, and local civic organizations. The differences between racial groups in the use of these information sources were minimal.

Insurance

For those victims who owned their own homes, insurance played a major role in recouping economic losses suffered in the disaster. Since few victims utilized SBA loans, IFG, or other aid sources in the repair and rebuilding of their homes, reconstruction in Paris was primarily financed by insurance monies. Of the 315 victims interviewed who owned their homes, 85.7% had household insurance at the time of the tornado. (Failure to have adequate insurance was one of the factors that determined the extent to which federal and other aid programs were utilized in reconstruction of private homes.)

TABLE III-4
HOUSE INSURANCE: USER CHARACTERISTICS

	HOMEOWNER INSURANCE AT TIME OF DISASTER	
	WHITE VICTIMS (n = 193)	BLACK VICTIMS (n = 122)
Total	88.5% (165)	86.1% (105)
Age		
Under 60 Years	87.4% (104)	83.1% (49)
60 Years and Older	82.4% (61)	88.9% (56)
Family Size		
3 Persons or Less	85.2% (121)	87.2% (75)
4 Or More	86.3% (44)	83.3% (30)
Income		
Moderate	79.1% (106)	85.1% (97)
High	100.0% (59)	100.0% (8)
Education		
High School or Less	81.6% (111)	88.2% (90)
College +	94.6% (53)	75.0% (15)
Occupation		
White Collar Worker	95.6% (65)	90.0% (9)
Blue Collar Worker	75.8% (75)	87.9% (87)

In Table III-4, the demographic and socioeconomic characteristics of insurance users are presented. The characteristics of race, age, and family size were not significantly associated with having household insurance (although it is interesting to note that among whites, slightly more young than elderly families had insurance, while among blacks, the opposite pattern held). Socioeconomic variables, on the other hand, were related for white victims; those with higher income, education, and occupational status were more likely to have household insurance. Among black families these variables were not significantly associated. However, again, since so few black families interviewed in Paris were in the

TABLE III-5
INSURANCE ADEQUACY

	VICTIMS EVALUATING COVERAGE AS ADEQUATE*	
	WHITE VICTIMS (n = 193)	BLACK VICTIMS (n = 122)
Total	60.7% (116)	50.0% (58)
Damage Level		
Moderate	68.1% (81)	57.5% (42)
High	48.6% (35)	37.2% (16)
Age		
Under 60 Years	61.3% (73)	45.5% (25)
60 Years and Older	59.7% (43)	54.1% (33)
Income		
Moderate	50.0% (66)	48.1% (52)
High	84.7% (50)	75.0% (6)

*80% to 100% of losses covered

higher socioeconomic stratum, these statistics should not be taken as conclusive. Similar to whites, black victims with white collar jobs and high income were slightly more likely to have insurance than those with blue collar occupations and/or lower income. However, unlike white victims, blacks with some college were slightly less likely to have insurance than those with less education.

Although having insurance is important, the adequacy of insurance is perhaps a more crucial factor. Table III-5 presents insurance adequacy cross-tabulated with several victim characteristics. (Victims who had 80% or more of their losses covered by insurance were categorized as having adequate coverage. The table includes only those victims who owned their homes at the time of the tornado.)

Although black families were equally as likely as white families to have household insurance, they were significantly less likely to consider their coverage adequate. For both racial groups, those with moderate damage were significantly more likely than those with high damage to have

adequate insurance coverage, and, as might be expected, those with high income were more likely to report adequate insurance than those with lower income. The difference between age groups in insurance coverage adequacy is minimal.

By the time of interviewing (eight months after the tornado), 99% of all respondents having insurance had settled their claims with their insurance companies. Eighty-nine percent believed that their settlements were fair and indicated that they had no problems with their insurance companies. Among those 31 respondents who were unsatisfied (19 white and 12 black victims), 35.5% said that they did not have enough coverage (the most common complaint), followed by 25.8% who felt they were misled by their insurance company about their coverage needs, and 12.9% who believed they had settled prematurely.

Concerning insurance coverage, there was one significant difference between racial groups. White families were much more likely than black to have insurance covering additional living expenses (A.L.E.). A.L.E. provides disaster victims with direct payments for expenses encountered due to their inability to live in storm-damaged homes. Lacking this resource, blacks were much more likely to utilize other aid and to use personal resources to pay for temporary housing.

To measure family recovery, victims were asked to rate their families' level of economic and emotional recovery from the disaster, and the responses were cross-tabulated with insurance (Table III-6).

Among white victims economic recovery was significantly associated with having house insurance, while no association was found for black families. This difference is likely to be a reflection of the higher incidence of inadequate insurance coverage reported by blacks. Emotional recovery on the other hand, appears to have been unrelated to insurance.

Having adequate coverage appears to be a more important factor than simply having insurance in explaining the difference between incomplete and complete recovery. As indicated in the table, families of both racial groups who had adequate insurance were significantly more likely to have completely recovered, both economically and emotionally, eight months after the disaster than those with inadequate insurance.

After major disasters, victims frequently obtain insurance if they had none before, or expand existing coverage (Drabek and Key, 1983;

TABLE III-6

INSURANCE AND FAMILY RECOVERY
(Those who owned homes)

	VICTIMS WHO HAD HOUSE INSURANCE APRIL 1979	VICTIMS WHO HAD ADEQUATE HOUSE INSURANCE
<u>WHITE VICTIMS</u>		
Economic Recovery Index		
Incomplete Recovery	77.9% (74) n = 95	40.9% (38) n = 93
Complete Recovery	92.9% (91) n = 98	79.6% (78) n = 98
	$\chi^2 = 7.54$ Sig. = .006	$\chi^2 = 28.41$ Sig. = 0.0
Emotional Recovery Index		
Incomplete Recovery	86.0% (92) n = 107	50.9% (54) n = 106
Complete Recovery	84.9% (73) n = 86	72.9% (62) n = 85
	$\chi^2 = 0.0$ Sig. = .992	$\chi^2 = 8.67$ Sig. = .003
<u>BLACK VICTIMS</u>		
Economic Recovery Index		
Incomplete Recovery	84.8% (67) n = 79	37.8% (28) n = 74
Complete Recovery	88.8% (38) n = 43	71.4% (30) n = 42
	$\chi^2 = 0.07$ Sig. = .778	$\chi^2 = 10.79$ Sig. = .001
Emotional Recovery Index		
Incomplete Recovery	86.1% (62) n = 72	40.9% (27) n = 66
Complete Recovery	86.0% (43) n = 50	62.0% (31) n = 50
	$\chi^2 = 0.0$ Sig. = 1.00	$\chi^2 = 4.25$ Sig. = .039

TABLE III-7
CHANGES IN HOUSE INSURANCE
(Those who owned homes)

	PERCENT HAVING HOUSE INSURANCE	
	April 1982	Currently
TOTAL	85.7% (n = 315)	88.9% (n = 316)
WHITE VICTIMS	85.5% (n = 193)	89.6% (n = 193)
BLACK VICTIMS	86.1% (n = 122)	87.8% (n = 123)
WHITE VICTIMS		
Moderate Damage	85.7% (119)	87.5% (120)
High Damage	85.1% (74)	93.2% (73)
BLACK VICTIMS		
Moderate Damage	84.6% (78)	87.2% (78)
High Damage	88.6% (44)	88.9% (45)
WHITE VICTIMS		
Under 60 Years	87.4% (119)	93.3% (119)
60 Years and Older	82.4% (74)	83.8% (74)
BLACK VICTIMS		
Under 60 Years	83.1% (59)	84.7% (59)
60 years and Older	88.9% (63)	90.6% (64)

Bolin, 1982). In general, the survey found a slight increase in insurance coverage after the storm. As indicated in Table III-7, this pattern held across racial groups, damage levels, and age groups. The only significant difference occurred between age groups of white victims. At the time of interviewing, younger white families were significantly more likely to have house insurance than older white families.

Since a considerable number of respondents (116) rented apartments or homes at the time of the tornado, insurance coverage of household contents was considered separately. At the time of the disaster, 64.7% of all respondents had insurance on their household contents. Whereas the difference between racial groups was not significant for insuring

homes, it was for insuring household contents. Among white respondents, 74.1% had insurance on their household contents, compared to 55.7% of black families. The tornado prompted more families in both racial groups to insure their household contents, with about the same percentage in each racial group obtaining new insurance after the storm. Thus, the difference between racial groups in insuring contents remained statistically significant. At the time of interviewing, 80.7% of whites and 61.0% of blacks had insurance on contents.

When having insurance on household contents is cross-tabulated with economic and emotional recovery, it appears that having this insurance did have a positive impact on both dimensions of recovery for both racial groups.

Primary Group Aid: Kin, Neighbors, and Friends

Primary groups--friends, neighbors, and kin--are an important source of aid, comfort, and support for disaster victims (Bolin, 1983). Typically, primary group aid is offered without victims having to request it, and recipients do not have to go through impersonal, bureaucratic procedures in order to obtain it. The immediate and relatively unconditional nature of such aid makes it particularly appropriate for stricken families in the emergency period. Data on the extent to which families in Paris utilized aid from friends and kin are presented in Table III-8.

White families were significantly more likely than black families to receive aid from kin (67.9% versus 47.9%). (Kin includes all relations by blood or marriage who live outside of the immediate household of the respondent.) On the face of it, this fact seems to disagree with previous findings on black kin groups in America (e.g., Stack, 1974). White families were also significantly more likely to receive aid from neighbors (31.1% versus 8.2%) and/or friends (54.7% versus 22.8%). Since black victims were of significantly lower socioeconomic status, the differences in aid may be attributed to the lack of resources among potential black aid givers. Thus, as already mentioned, this lack of resources also explains why black victims had to rely on governmental aid.

By age group, younger white victims were significantly more likely than older ones to receive aid from all categories of the primary group. However, slightly more older than younger black families received aid

TABLE III-8
PRIMARY GROUP AID

		THOSE RECEIVING AID FROM:		
		<u>RELATIVES</u>	<u>NEIGHBORS</u>	<u>FRIENDS</u>
WHITE VICTIMS	n = 212	67.9% (144)	31.1% (66)	54.7% (116)
BLACK VICTIMS	n = 219	47.9% (105)	8.2% (18)	22.8% (50)
WHITE VICTIMS: AGE				
<60 Yrs.	n = 131	78.6% (103)	38.2% (50)	68.7% (90)
≥60 Yrs.	n = 81	50.6% (41)	19.8% (16)	32.1% (90)
BLACK VICTIMS: AGE				
<60 Yrs.	n = 136	46.3% (63)	7.4% (10)	19.9% (27)
≥60 Yrs.	n = 83	50.6% (42)	9.6% (8)	27.7% (23)
WHITE VICTIMS: FAMILY SIZE				
≤3 pers	n = 158	69.0% (109)	28.5% (45)	55.1% (87)
≥4 pers	n = 54	64.8% (35)	38.9% (21)	53.7% (29)
BLACK VICTIMS: FAMILY SIZE				
≤3 pers	n = 133	47.4% (63)	8.3% (11)	24.1% (32)
≥4 pers	n = 86	48.8% (42)	8.1% (7)	20.9% (18)
WHITE VICTIMS: INCOME				
Moderate	n = 150	63.3% (95)	22.0% (33)	48.7% (73)
High	n = 62	79.0% (49)	53.2% (33)	69.4% (43)
BLACK VICTIMS: INCOME				
Moderate	n = 209	48.8% (102)	7.7% (16)	23.0% (48)
High	n = 10	30.0% (3)	20.0% (2)	20.0% (2)
WHITE VICTIMS: EDUCATION				
High School Grad or Less	n = 148	63.5% (94)	23.0% (34)	48.0% (71)
College+	n = 62	77.4% (48)	50.0% (31)	69.4% (43)
BLACK VICTIMS: EDUCATION				
High School Grad or Less	n = 190	48.9% (93)	7.9% (15)	23.2% (44)
College+	n = 28	42.9% (12)	10.7% (2)	21.4% (6)

(continued)

TABLE III-8 (Continued)

	THOSE RECEIVING AID FROM:		
	<u>RELATIVES</u>	<u>NEIGHBORS</u>	<u>FRIENDS</u>
WHITE VICTIMS: EMPLOYMENT			
White Collar n = 84	77.4% (65)	45.2% (38)	61.9% (52)
Blue Collar n = 116	60.3% (70)	22.4% (26)	49.1% (57)
BLACK VICTIMS: EMPLOYMENT			
White Collar n = 14	28.6% (4)	7.1% (1)	28.6% (4)
Blue Collar n = 170	48.8% (83)	8.2% (14)	22.9% (39)
WHITE VICTIMS: DAMAGE SUFFERED			
Moderate n = 132	59.1% (78)	26.5% (35)	48.5% (64)
High n = 80	82.5% (66)	38.8% (31)	65.0% (52)
BLACK VICTIMS: DAMAGE SUFFERED			
Moderate n = 164	37.7% (55)	7.5% (11)	15.8% (23)
High n = 73	68.5% (50)	9.6% (7)	37.0% (27)
WHITE VICTIMS: FAMILY INJURED IN STORM			
None n = 186	68.8% (128)	28.5% (53)	55.4% (103)
One or More n = 26	61.5% (16)	50.0% (13)	50.0% (13)
BLACK VICTIMS: FAMILY INJURED IN STORM			
None n = 201	46.8% (94)	7.0% (14)	20.9% (42)
One or More n = 18	61.1% (11)	22.2% (4)	44.4% (8)

from the three categories. Receipt of aid from primary group members does not appear to be significantly associated with family size for either racial group.

Among white families, those in the higher socioeconomic categories of income, education, and occupational status were consistently significantly more likely than others to receive aid from primary group members. However, the relationship between socioeconomic status and receipt of aid from primary group members among blacks was more complex. For example, blacks with lower income or less education were slightly more likely to receive aid from family and friends, while those with high incomes or

more education were slightly more likely to receive aid from their neighbors. Black households headed by blue collar workers were more likely to receive aid from relatives and neighbors, whereas white collar households were more apt to receive aid from friends.

In both racial groups, families with high losses relied on primary group aid more frequently than those with less severe losses.

Whether or not family members were injured significantly affected the receipt of primary group aid. Among white victims, families who experienced injuries were more likely to receive aid from neighbors than those who had no injuries. Similarly, black families who had sustained injuries were more likely than those who had not to receive aid from both neighbors and friends. Injuries among disaster victims tend to reduce their recovery potential while increasing demands and stresses on their families. It is not surprising that injuries may increase the receipt of aid and support from those close to the victims' families.

TABLE III-9
PRIMARY GROUP AID AND FAMILY RECOVERY

	ECONOMIC RECOVERY INDEX	
	<u>COMPLETE</u>	<u>INCOMPLETE</u>
WHITE VICTIMS RECEIVING:		
Aid from Kin n = 144	54.2% (78)	45.8% (66)
Aid from Friends n = 116	50.9% (59)	49.1% (57)
BLACK VICTIMS RECEIVING:		
Aid from Kin n = 105	19.0% (20)	81.0% (85)
Aid from Friends n = 50	22.0% (11)	78.0% (39)
	EMOTIONAL RECOVERY INDEX	
	<u>COMPLETE</u>	<u>INCOMPLETE</u>
WHITE VICTIMS RECEIVING:		
Aid from Kin n = 144	43.8% (63)	56.3% (81)
Aid from Friends n = 116	42.2% (49)	57.8% (67)
BLACK VICTIMS RECEIVING:		
Aid from Kin n = 105	28.6% (30)	71.4% (75)
Aid from Friends n = 50	34.0% (17)	66.0% (33)

Respondents' assessments of their economic and emotional recovery were cross-tabulated with receipt of primary group aid. The results are presented in Table III-9.

Among white families, there were slight positive relationships between receiving aid from kin and friends and subsequent economic recovery. In contrast, the relationships between aid from kin and friends and economic recovery were negative among black families. The relationships between emotional recovery and aid from kin and friends were negative for both racial groups, although most relationships were weak--the exception being for that between aid from kin and emotional recovery among black families.

Findings: Determinants of Recovery

Previous research on family recovery (e.g., Bolin, 1976; Bolin, 1982) has demonstrated that recovery outcomes may be affected by a number of factors: victims' predisaster demographic and socioeconomic characteristics which affect a family's stress response capabilities, as well as a complex set of impact and response characteristics.

Table III-10 demonstrates the influence of several factors on economic recovery outcomes. As indicated, at the time of the interviews, 39.4% of the subjects reported that they were fully recovered economically. The differences in economic recovery between racial groups were statistically significant, with white families more likely to be fully recovered than blacks.

Although older families in both racial groups were more likely than younger ones to be fully recovered economically, differences were not large. However, for both racial groups, smaller families were more likely to report economic recovery than larger ones; families with higher incomes and lower loss levels were also significantly more likely to report such recovery.

Table III-11 examines factors affecting levels of emotional recovery. Approximately the same percentage of total respondents were fully recovered emotionally eight months after the disaster as were fully recovered economically. As with economic recovery, white families were significantly more likely to be fully recovered emotionally than were black families. Similarly, older families in both racial groups were

TABLE III-10
INFLUENCES ON ECONOMIC RECOVERY

	ECONOMIC RECOVERY INDEX	
	COMPLETE	INCOMPLETE
TOTAL n = 431	39.4% (170)	60.6% (261)
WHITE VICTIMS n = 212	51.4% (109)	48.6% (103)
BLACK VICTIMS n = 219	27.9% (61)	72.1% (158)
	$\chi^2 = 24.06$	
	Sig. = 0.0	
WHITE VICTIMS: AGE		
<60 Yrs. n = 131	49.6% (65)	50.4% (66)
≥60 Yrs. n = 81	54.3% (44)	45.7% (37)
	$\chi^2 = 0.27$	
	Sig. = .600	
BLACK VICTIMS: AGE		
<60 Yrs. n = 136	26.5% (36)	73.5% (100)
≥60 Yrs. n = 83	30.1% (25)	69.9% (58)
	$\chi^2 = 0.18$	
	Sig. = .668	
WHITE VICTIMS: FAMILY SIZE		
≤3 pers n = 158	53.2% (84)	46.8% (74)
≥4 pers n = 54	46.3% (25)	53.7% (29)
	$\chi^2 = 0.51$	
	Sig. = .48	
BLACK VICTIMS: FAMILY SIZE		
≤3 pers n = 133	32.3% (43)	67.7% (90)
≥4 pers n = 86	20.9% (18)	79.1% (68)
	$\chi^2 = 2.83$	
	Sig. = .09	

(continued)

TABLE III-10 (Continued)

	ECONOMIC RECOVERY INDEX	
	COMPLETE	INCOMPLETE
WHITE VICTIMS: INCOME		
Moderate* n = 150	42.0% (63)	58.0% (87)
High** n = 62	74.2% (46)	25.8% (16)
	$\chi^2 = 16.93$	
	Sig. = .000	
BLACK VICTIMS: INCOME		
Moderate n = 209	26.3% (55)	73.7% (154)
High n = 10	60.0% (6)	40.0% (4)
	$\chi^2 = 3.84$	
	Sig. = .05	
WHITE VICTIMS: DAMAGE SUFFERED		
Moderate n = 132	64.4% (85)	35.6% (47)
High n = 80	30.0% (24)	70.0% (56)
	$\chi^2 = 22.23$	
	Sig. = .000	
BLACK VICTIMS: DAMAGE SUFFERED		
Moderate n = 146	35.6% (52)	64.4% (94)
High n = 73	12.3% (9)	87.7% (64)
	$\chi^2 = 12.00$	
	Sig. = .001	

* < \$1,000/month

** ≥ \$1,000/month

TABLE III-11
INFLUENCES ON EMOTIONAL RECOVERY

	EMOTIONAL RECOVERY INDEX	
	<u>COMPLETE</u>	<u>INCOMPLETE</u>
TOTAL n = 431	39.2% (169)	60.8% (262)
WHITE VICTIMS n = 212	43.9% (93)	56.1% (119)
BLACK VICTIMS n = 219	34.7% (76)	65.3% (143)
	$\chi^2 = 3.42$	
	Sig. = .06	
WHITE VICTIMS: AGE		
<60 Yrs. n = 131	38.2% (50)	61.8% (81)
≥60 Yrs. n = 81	53.1% (43)	46.9% (38)
	$\chi^2 = 3.94$	
	Sig. = .05	
BLACK VICTIMS: AGE		
<60 Yrs. n = 136	33.1% (45)	66.9% (91)
≥60 Yrs. n = 83	37.3% (31)	62.7% (52)
	$\chi^2 = 0.25$	
	Sig. = .62	
WHITE VICTIMS: FAMILY SIZE		
≤3 pers n = 158	48.7% (77)	51.3% (81)
≥4 pers n = 54	29.6% (16)	70.4% (38)
	$\chi^2 = 5.21$	
	Sig. = .02	
BLACK VICTIMS: FAMILY SIZE		
≤3 pers n = 133	36.1% (48)	63.9% (85)
≥4 pers n = 86	32.6% (28)	67.4% (58)
	$\chi^2 = 0.15$	
	Sig. = .69	

(continued)

TABLE III-11 (Continued)

		EMOTIONAL RECOVERY INDEX	
		<u>COMPLETE</u>	<u>INCOMPLETE</u>
WHITE VICTIMS: INCOME			
Moderate*	n = 150	38.7% (58)	61.3% (92)
High**	n = 62	56.5% (35)	43.5% (27)
		$\chi^2 = 4.94$	
		Sig. = .02	
BLACK VICTIMS: INCOME			
Moderate	n = 209	33.5% (70)	66.5% (139)
High	n = 10	60.0% (6)	40.0% (4)
		$\chi^2 = 1.90$	
		Sig. = .16	
WHITE VICTIMS: DAMAGE SUFFERED			
Moderate	n = 132	53.0% (70)	47.0% (62)
High	n = 80	28.8% (23)	71.3% (57)
		$\chi^2 = 10.96$	
		Sig. = .001	
BLACK VICTIMS: DAMAGE SUFFERED			
Moderate	n = 146	40.4% (59)	59.6% (87)
High	n = 73	23.3% (17)	76.7% (56)
		$\chi^2 = 5.56$	
		Sig. = .01	

* < \$1,000/month

** ≥ \$1,000/month

TABLE III-12

AID ADEQUACY

	THOSE REPORTING TOTAL AID AS ADEQUATE* WHITE VICTIMS	BLACK VICTIMS
TOTAL	61.1% (124)	30.5% (62)
DAMAGE: Moderate	63.6% (82)	33.6% (45)
High	56.8% (42)	24.6% (17)
AGE: <60 Yrs. n = 136	64.0% (80)	24.2% (30)
≥60 Yrs. n = 83	56.4% (44)	40.5% (32)
INCOME: Moderate	51.1% (72)	30.1% (58)
High	83.9% (52)	40.0% (4)
FAMILY SIZE: ≤3 persons	60.9% (92)	34.9% (44)
≥4 persons	61.5% (32)	23.4% (18)

25 Missing Cases

*Adequacy is defined as at least 80% of incurred losses being covered by aid from all sources.

more likely to report emotional recovery. Small family size also appeared to positively influence emotional recovery among white families, but had a minimal influence among blacks.

Income and damage levels had similar affects on emotional recovery in both racial groups. Those with high incomes were significantly more likely to be emotionally recovered, although the association is weak among black families. Families with moderate incomes in both racial groups were significantly more likely than those with high incomes to be fully emotionally recovered--contradicting the findings of previous research (Bolin, 1982).

The effects of background factors on aid adequacy are presented in Table III-12. Victims were asked to assess the percentage of all their losses covered by formal aid sources and insurance. Aid adequacy was dichotomized into adequate (80% or more of the losses covered) and inadequate (less than 80% covered). Only 45.8% of all respondents indicated that they received adequate aid. Differences between racial groups

were significant, with half the percentage of blacks compared to whites reporting having received adequate aid.

As may be expected, families in both racial groups with moderate damage were slightly more likely to receive adequate aid than those with higher loss levels. Among white families, the association between age and aid adequacy was not significant; however, among blacks the association was statistically significant, with more older families saying that they received adequate aid. In addition, in both racial groups, families with high incomes were more likely than those with lower incomes to have received adequate aid. Family size had a minimal effect among white families, but among blacks, smaller families were more likely to report receiving adequate aid.

Table III-13 cross-tabulates the number of formal aid sources used

TABLE III-13

NUMBER OF AID SOURCES AND FAMILY RECOVERY

<u>Number of Aid Sources</u>			ECONOMIC RECOVERY INDEX	
			<u>COMPLETE</u>	<u>INCOMPLETE</u>
WHITE VICTIMS:	≤3 sources	n=152	64.5% (98)	35.5% (54)
	>3 sources	n=60	18.3% (11)	81.7% (49)
			$\chi^2 = 34.84$	
			Sig. = .000	
BLACK VICTIMS:	≤3 sources	n=139	38.8% (54)	61.2% (85)
	>3 sources	n=80	8.8% (7)	91.3% (73)
			$\chi^2 = 21.42$	
			Sig. = .000	
<u>Number of Aid Sources</u>			EMOTIONAL RECOVERY INDEX	
			<u>COMPLETE</u>	<u>INCOMPLETE</u>
WHITE VICTIMS:	≤3 sources	n=152	51.3% (78)	48.7% (74)
	>3 sources	n=60	25.0% (15)	75.0% (45)
			$\chi^2 = 11.05$	
			Sig. = .001	
BLACK VICTIMS:	≤3 sources	n=139	43.9% (61)	56.1% (78)
	>3 sources	n=80	18.8% (15)	81.3% (65)
			$\chi^2 = 13.07$	
			Sig. = .000	

and indices of economic and emotional recovery, and indicates that the number of aid sources was negatively related to both economic and emotional recovery for both racial groups. The reason for this phenomenon, also reported in other recovery research (Bolin, 1982), is that utilizing a number of aid sources reflects a family's difficulty in recovering and inability to get sufficient aid from a single source.

Multivariate Analyses of Recovery

In order to consider a number of factors in terms of their simultaneous and interactive effects on recovery, two different multivariate analyses of the Paris data were conducted. First, black victim and white victim recovery was compared utilizing discriminant function analysis--a statistical technique that derives mathematical axes (discriminant functions) that maximize differences between previously designated criterion groups for a dependent variable (Cooley and Lohnes, 1971). The functions represent linear combinations of independent variables that best measure the differences between groups in the dependent variables (Snedecor and Cochran, 1976).

This study considers two dependent variables for each of the two Paris subsamples--economic and emotional recovery among black and white victims. Questions concerning these variables used a 5 point (0-4) self rating scale, where 0 represented no recovery and 4 meant complete recovery. These scales were collapsed into three categories for this analysis: complete recovery (4), intermediate recovery (3), and low recovery (0-2). The aim of this type of analysis is to determine a set of independent variables which prove to be the best discriminators among the three levels of recovery for each dimension (emotional and economic) for each racial group. A number of independent variables were selected for study based upon a review of previous research and upon a stepwise procedure in the statistical program used for the analysis that identifies important discriminators.

Table III-14 presents the standardized discriminant function coefficients for black victims regarding levels of economic recovery. The relative size of the coefficients indicates their individual contribution to each of the two discriminant functions. Correspondingly, each discriminant function may be verbally characterized by the pattern of variables that contribute the most to it (in this case, those with coeffi-

TABLE III-14
STANDARDIZED DISCRIMINANT FUNCTION COEFFICIENTS
FOR ECONOMIC RECOVERY OF BLACK VICTIMS

<u>VARIABLE LABEL</u>	<u>FUNCTION 1</u>	<u>FUNCTION 2</u>
Interfaith Aid	.723	.153
Current Housing is Poor	-.994	.343
Lived in FEMA Trailer	.266	.643
Red Cross Aid	3.021	-.221
Total Number of Housing Changes	-.843	-.073
IFG Aid	4.875	.781
Percent Losses That Were Insured	.734	.174
Primary Group Aided Economic Recovery	-.962	-.123
Primary Group Aided Emotional Recovery	.461	.944
Temporary Shelter With Family/Friend	.549	.0083
Weather Anxieties	.134	-.516
Number of Minor Children	.217	-.537

Percent of variance explained	81.78%	18.22%

TABLE III-15
STANDARDIZED DISCRIMINANT FUNCTION COEFFICIENTS
FOR EMOTIONAL RECOVERY OF BLACK VICTIMS

<u>VARIABLE LABEL</u>	<u>FUNCTION 1</u>	<u>FUNCTION 2</u>
Loss of Mementos	.026	-.560
Interfaith Aid	.453	4.245
Visitation Frequency With Relatives	.281	3.998
Percent of Losses Insured	.284	.095
Number of Close Relatives	-.172	.703
Primary Group Aided Emotional Recovery	.546	.120
"I Have Little Influence Over Events"	.264	-.802
Experienced Emotional Strains	-.623	.078
Family Life Is Still Disrupted	-.357	.008
Sleep Disturbances	-.510	-.072
Storm Anxieties	-.822	.432

Percent of variance explained	73.16%	26.84%

cients of .500 or more). Thus function 1 may be characterized as a combination of recovery aid and housing factors. Aid from the Red Cross, family grants (IFG), and Interfaith Disaster Services all contribute strongly. Significant housing factors include the number of postdisaster residential changes (negative score), poor current housing conditions (negative score) and obtaining temporary shelter from friends or relatives (positive score).

Function 2 includes several other variables that are significantly associated--two having a psychosocial dimension: whether the primary group aided in emotional recovery and whether victims had anxieties over bad weather (negative score). In addition, having lived in a FEMA trailer contributes positively to function 2, while the number of dependent children contributes negatively. This latter factor is the only demographic variable identified as contributing to a function determining black emotional recovery. It suggests that having a larger number of dependents in a household inhibits or slows economic recovery from disaster.

Looking at the proportion of variance in economic recovery accounted for by the two functions, the aid and housing function (#1) accounts for the greatest amount (81.78%), although Function 2 also explains a statistically significant amount of variance (18.22%).

Table III-15 presents the discriminant function coefficients for emotional recovery of black victims. Function 1 may be described by four key psychosocial variables: primary group aid in emotional recovery, having storm related emotional strains (negative score), experiencing storm related sleep disturbances (negative score) and anxieties over weather phenomena (negative score). Function 2 may be described as a combination of psychosocial disruption variables and aid and social support variables. In the former, two negative variables stand out: the loss of mementos in the disaster and a belief in the lack of personal control over life events (a measure of fatalism). The aid variable that most strongly contributes is help received from Interfaith Disaster Services. The social support variables most strongly associated include visitation frequencies and the number of close relatives in town. Of the two discriminant functions, function 1 accounts for most of explained variance (73.16%), although Function 2 also accounts for a statistically

TABLE III-16
STANDARDIZED DISCRIMINANT FUNCTION COEFFICIENTS
FOR ECONOMIC RECOVERY OF WHITE VICTIMS

<u>VARIABLE LABEL</u>	<u>FUNCTION 1</u>	<u>FUNCTION 2</u>
Total Losses	-.775	-.154
Losses Relative to Other Victims	-.599	.357
Loss of Mementos	-.506	.222
Temporary Shelter With Kin	-.280	-.453
Red Cross Aid	-.613	8.730
SBA Loan	1.523	5.075
IFG Aid	.671	3.588
Percent of Loss Covered by Aid/Insur.	.155	.611
Number of Close Relatives	-.373	-.176
Received Aid from Friends	-.070	.501
Primary Group Aid in Economic Recovery	-.161	.722
Increases in Cost of Living	-.591	.099

Percent of variance explained	78.41%	32.59%

TABLE III-17
STANDARDIZED DISCRIMINANT FUNCTION COEFFICIENTS
FOR EMOTIONAL RECOVERY OF WHITE VICTIMS

<u>VARIABLE LABEL</u>	<u>FUNCTION 1</u>	<u>FUNCTION 2</u>
Number of Close Friends	.508	.186
Household Member Injured	-.759	.287
Knew Others Killed or Injured	-.254	.017
Percent Losses Insured	.224	.480
Received Aid from Relatives	.218	.372
Experienced Emotional Strains	-.026	-.542
Poor Current Housing Situation	-.576	.395
Family Is Still Disrupted	-.683	.060
Sleep Disturbances	-.193	-.652
Storm Anxieties	-.299	-.580
Respondent's Age	.458	.288

Percent of variance explained	73.23%	26.77%

significant amount (26.84%).

Tables III-16 and III-17 present economic and emotional recovery discriminant function scores for white victims. For their economic recovery, function 1 may be described by several disaster loss variables all of which contribute negatively: total losses (in terms of percent of home and possessions destroyed), losses relative to those around victims (an indicator of relative deprivation), the loss of mementos and personal possessions, and increased costs of living. Function 2 consists entirely of aid variables that contribute positively: IFG, SBA, and Red Cross aid as well as the percent of losses that the victim was able to cover by aid and insurance. Additionally, aid from friends and the victim's evaluation of the role of primary group aid in economic recovery both contribute significantly. Function 1 accounts for approximately twice the explained variance as function 2 (67.41% versus 32.59%).

For emotional recovery of white families, function 1, which explains 73.23% of the variance, is best described by four psychosocial/social support factors: the number of close friends victims had in town, the number of household members injured (negative score), poor housing conditions at the time of the interview (negative score), and continuing storm-related family disruptions (negative score). Function 2, which accounts for 26.77% of the variance, is characterized by three negative psychosocial impact variables: emotional strains from the disaster, storm-related sleep disturbances, and anxieties during threatening weather. No demographic factors contribute at the .5 or higher level for either function, although respondent's age does load relatively strongly on function 1. Past research has shown the positive effect of age on emotional recovery (Bolin and Klenow, 1983).

The ability of the derived functions to separate the recovery group centroids (mean scores for the groups) was also examined. Table III-18 presents the group centroids for the discriminant scores on economic recovery (both for black and white victims) and Table III-19 does the same for emotional recovery. For each table the relative size of the difference between reported values of the centroids is an indicator of how well the functions separate the levels of recovery of victims.

To test for the statistical significance of the differences between recovery group means (centroids), a series of comparisons using an F test

TABLE III-18
GROUP CENTROIDS FOR DISCRIMINANT SCORES ON ECONOMIC RECOVERY
(White scores in parentheses)

<u>RECOVERY GROUP</u>	<u>CENTROIDS FUNCTION 1</u>		<u>CENTROIDS FUNCTION 2</u>	
Low Recovery	1.582	(-1.482)	.415	(-.723)
Intermediate Recovery	-.142	(-.527)	-.447	(1.252)
Complete Recovery	-1.40	(.965)	.625	(-.226)

TABLE III-19
GROUP CENTROIDS FOR DISCRIMINANT SCORES ON EMOTIONAL RECOVERY
(White scores in parentheses)

<u>RECOVERY GROUP</u>	<u>CENTROIDS FUNCTION 1</u>		<u>CENTROIDS FUNCTION 2</u>	
Low Recovery	-1.354	(1.413)	.453	(.017)
Intermediate Recovery	-.049	(-.531)	-.607	(-.741)
Complete Recovery	.858	(-.575)	.387	(.532)

TABLE III-20
F STATISTIC SIGNIFICANCE TEST BETWEEN GROUP MEANS
FOR EMOTIONAL RECOVERY
(White victim statistics in parentheses)

<u>RECOVERY GROUP</u>	<u>LOW RECOVERY</u>		<u>INTERMEDIATE RECOVERY</u>	
Intermediate Recovery	2.96*	(4.34*)		
Complete Recovery	4.99*	(4.80*)	2.57*	(1.95*)

*p < .05

TABLE III-21
F STATISTIC SIGNIFICANCE TEST BETWEEN GROUP MEANS
FOR ECONOMIC RECOVERY
(White victim statistics in parentheses)

<u>RECOVERY GROUP</u>	<u>LOW RECOVERY</u>		<u>INTERMEDIATE RECOVERY</u>	
Intermediate Recovery	3.23	(2.40)		
Complete Recovery	5.39*	(4.30)	2.23*	(2.93)

*p < .05

were run for both subsamples on each of the two recovery measures (Tables III-20 and III-21). In all instances statistically significant differences between group means were found for both sets of victims. This indicates that the discriminant functions distinguish well among recovery levels for both subsamples on each of the dependent variables (economic and emotional recovery).

To summarize, the variables that proved to be the best predictors of economic recovery were, as might be expected, aid received. It is interesting to note that primary group aid appeared as a negative factor in economic recovery, suggesting that the primary group in this instance did not functionally aid economic recovery. While the variables selected as good discriminators of white economic recovery levels were similar to those selected for blacks, some important differences did appear. SBA loans figured prominently in white recovery but not for blacks, reflecting the inability of blacks to qualify for such loans. Other research (e.g., Bolin, 1982) has shown low interest SBA loans to be an important factor permitting families to rebuild homes and resettle promptly. Both the elderly and the poor (including blacks) are typically not able to qualify for such loans, hence their typically slower rates of economic recovery.

Another important difference between the two subsamples is that for whites, primary group aid contributed positively to one economic recovery function, while for blacks the same coefficient was negative. This suggests that differences existed in the ability of the respective social support groups to provide aid that contributed to economic recovery. Again, this undoubtedly reflects the socioeconomic differences between the two groups. However, it bears noting that for neither black nor white victims did the stepwise selection of independent variables pick any socioeconomic status variables as important discriminators of levels of economic recovery.

For black victims, emotional recovery was found to be determined by a combination of social support and psychosocial impact variables, the latter having negative discriminant function scores. This role of social support (buffering the effects of a stressor, such as a disaster) is well documented in social support literature (see, for example, Kahn and Antonucci, 1980). In this study, the support of family and kin was found

particularly important in black emotional recovery. Although psychosocial impact variables were also related to the emotional recovery of white victims, whites differed from blacks in that fewer social support items were selected as discriminators for white emotional recovery. Negative effects of having family injured in the disaster and knowing others killed or injured were found among white but not black victims.

Tables III-18 and III-19 also demonstrate possible differences between black and white recovery. The test of significance for group mean differences (Tables III-20 and III-21) show that for both blacks and whites, the functions are successful in obtaining significantly different recovery group means. Within each racial category the functions also discriminate well between the three recovery levels of both emotional and economic recovery. This suggests that the selected variables and the functions derived from them constitute a good set of factors determining both dimensions of recovery for each racial group.

Thus, this analysis illustrates that differences exist between the two racial groups vis a vis the factors that can predict recovery levels. Those differences were not found to directly involve demographic or socioeconomic differences, but rather differences in losses, psychosocial impacts, aid received, and social support.

Modeling the Recovery Process

The preceding tabular and discriminant analyses illustrate a number of differences between blacks and whites in terms of their aid utilization and their overall disaster recovery. In this section, a multivariate model of the recovery process is presented and tested. In it, race and the utilization of aid programs will be considered as part of a network of variables acting in concert to determine recovery outcomes of disaster victims.

As noted in Chapter II, numerous models of the family recovery process have been developed, beginning with Hill's (1949) A,B,C,-X schema. Contained in any such model must be the notion of process: a system in an initial state is disrupted by an event, precipitating changes in the organizational features of the system as it adjusts to the disruption; subsequently, the system recovers from the disruptions and establishes more normal organizational patterns over a period of time.

In terms of family recovery, the "initial state" includes such factors as the family's demographic and socioeconomic characteristics prior to the disaster. The "disruptive event" is, of course, the disaster and is generally measured by such impact indicators as losses to home and contents, physical injuries and/or death, psychological/mental health impacts, and disruptions of normal interaction patterns of the family. "Changes in organizational features" include the activities that families engage in to acquire aid, to make insurance claims, to begin rebuilding homes, and to re-establish normal living patterns. "Recovery" refers to the family's evaluation of the outcomes of the complex social processes initiated by the disaster.

This general outline was followed to develop a model of family recovery for Paris as well as the sites described in Chapters V and VI. The model is derived in part from the previous work of both authors (Bolin, 1982; Bolton, 1979), although there are important differences. It should also be noted that the model as applied in Paris differs in some ways from that applied to the Kauai and Coalinga sites: the latter studies include a measure of unemployment which the Paris model does not, whereas the Paris model includes family size as an independent variable, a variable not found to be useful in the other studies. Because path analysis was used to describe the processes at these three different sites, we have attempted to simplify the models somewhat by looking at a single measure of recovery--economic recovery. Of course, as we have noted, there are other important dimensions of recovery, but for the sake of parsimony these are not included as part of the multiple regression analysis. In this chapter as well as Chapter V, separate regressions are done for each ethnic sample, and then path models are developed and presented to facilitate easy visual comparison of the determinants of economic recovery for the different groups.

The model has three levels of variables, arranged in chronological sequence from predisaster factors to recovery outcome. The antecedent variables include general background characteristics of victims as well as disaster impact. The mediating variables (those chronologically after impact, but antecedent to and determining recovery) include the various response strategies that victims used. The dependent variable is economic recovery.

TABLE III-22
OPERATIONALIZATION OF PATH MODEL OF FAMILY RECOVERY

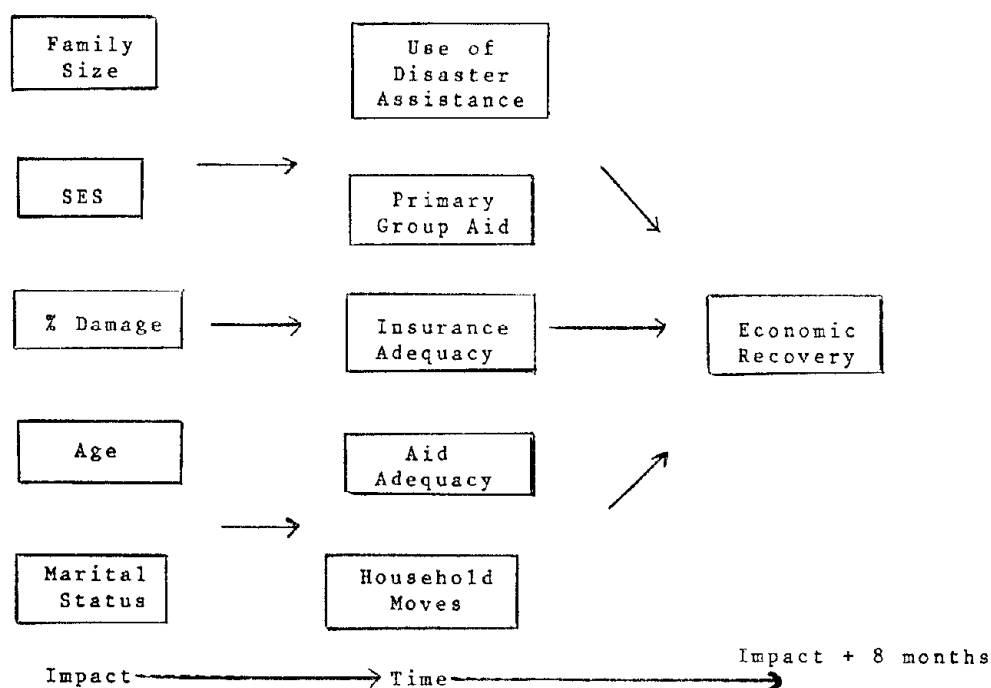
<u>VARIABLE</u>	<u>DESCRIPTION OF MEASUREMENT</u>
Family Size	Numbers of related persons in household
SES	Standardized index of head of household's income, education, occupation
% of Damage	Percent of home destroyed by tornado
Age	Head of household's age in years
Marital Status	Marital status of respondent (married/nonmarried)
Use of Disaster Assistance	Number of aid sources used (0-5) (FEMA, SBA, Red Cross, IFG, IDS)
Insurance Adequacy	Percent of losses covered by insurance
Aid Adequacy	Percent of losses covered by formal aid
Primary Group Aid	Whether respondent received aid from kin and/or friends
Household Moves	Total number of post-disaster residential changes made
Economic Recovery	Five point self assessment scale of extent of victim's economic recovery

For Paris, the independent variables selected are family size, socioeconomic status, percent of damage to the home, respondent age, and marital status (the latter being a measure of primary social support and coded as married/not married). The mediating variables are use of formal disaster assistance, primary group aid, insurance adequacy, formal aid adequacy, and number of household moves. The dependent variable for all models is economic recovery, as perceived by the victim. The operational measurement of all variables is described in Table III-22 and a general schematic of the model is illustrated in Figure III-1.

Multiple regression was used to assess the fit of the proposed model

FIGURE III-1

MODEL OF FAMILY RECOVERY
(arrows indicate causal flow)



with the Paris data. Tables III-23 and III-24 present the results of the analyses in terms standardized coefficients or beta weights. These coefficients permit comparison of the strengths of association for theoretically specified relationships of variables. This, in turn, allows the identification of causally significant relationships within a complex web of variables (Figures III-2 and III-3). Table III-23 presents findings from data on white victims in Paris, while III-24 does the same for black

TABLE III-23

ESTIMATES OF THE STRUCTURAL PARAMETERS
OF THE PATH MODEL OF FAMILY RECOVERY
WHITE SAMPLE, PARIS (n = 212)

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PATH COEFFICIENT	EXPLAINED VARIANCE (R ²)	ERROR VARIANCE
Use of Disaster Assistance	Family Size	-.13*	.21	.79
	SES	.14*		
	% of Damage	.22*		
	Age	-.25*		
	Marital Status	.04		
Primary Group Aid	Family Size	-.01	.09	.91
	SES	.11		
	% of Damage	.06		
	Age	-.04		
	Marital Status	-.14*		
Insurance Adequacy	Family Size	-.06	.24	.76
	SES	.21*		
	% Damage	.28*		
	Age	.17*		
	Marital Status	.02		
Aid Adequacy	Family Size	-.21*	.29	.71
	SES	.34*		
	% Damage	.22*		
	Age	-.09		
	Marital Status	.03		
Household Moves	Family Size	.21*	.19	.81
	SES	-.19*		
	% Damage	.10		
	Age	.14*		
	Marital Status	.02		
Economic Recovery	Family Size	-.21*	.39	.61
	SES	.29*		
	% Damage	.07		
	Age	-.08		
	Marital Status	.03		
	Use of Disaster Assistance	.37*		
	Primary Group Aid	-.09		
	Insurance Adequacy	.30*		
	Aid Adequacy	.36*		
	Household Moves	-.03		

*Significant at .05 level.

TABLE III-24

ESTIMATES OF THE STRUCTURAL PARAMETERS
OF THE PATH MODEL OF FAMILY RECOVERY
BLACK SAMPLE, PARIS (n = 212)

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PATH COEFFICIENT	EXPLAINED VARIANCE (R ²)	ERROR VARIANCE
Use of Disaster Assistance	Family Size	-.12	.23	.77
	SES	.10		
	% of Damage	.23*		
	Age	-.20*		
	Marital Status	.16*		

Primary Group Aid	Family Size	-.33	.24	.76
	SES	.09		
	% of Damage	.14*		
	Age	-.17*		
	Marital Status	-.18*		

Insurance Adequacy	Family Size	-.04	.31	.69
	SES	.38*		
	% Damage	.24*		
	Age	-.17*		
	Marital Status	.04		

Aid Adequacy	Family Size	-.29*	.34	.66
	SES	.30*		
	% Damage	.06		
	Age	-.19*		
	Marital Status	.01		

Household Moves	Family Size	.19*	.30	.70
	SES	-.28*		
	% Damage	.04		
	Age	-.29*		
	Marital Status	.09		

Economic Recovery	Family Size	-.41*	.44	.56
	SES	.34*		
	% Damage	.12		
	Age	-.09		
	Marital Status	.03		
	Use of Disaster Assistance	.20*		
	Primary Group Aid	-.25*		
	Insurance Adequacy	.19*		
	Aid Adequacy	.24*		
	Household Moves	-.19*		

*Significant at .05 level.

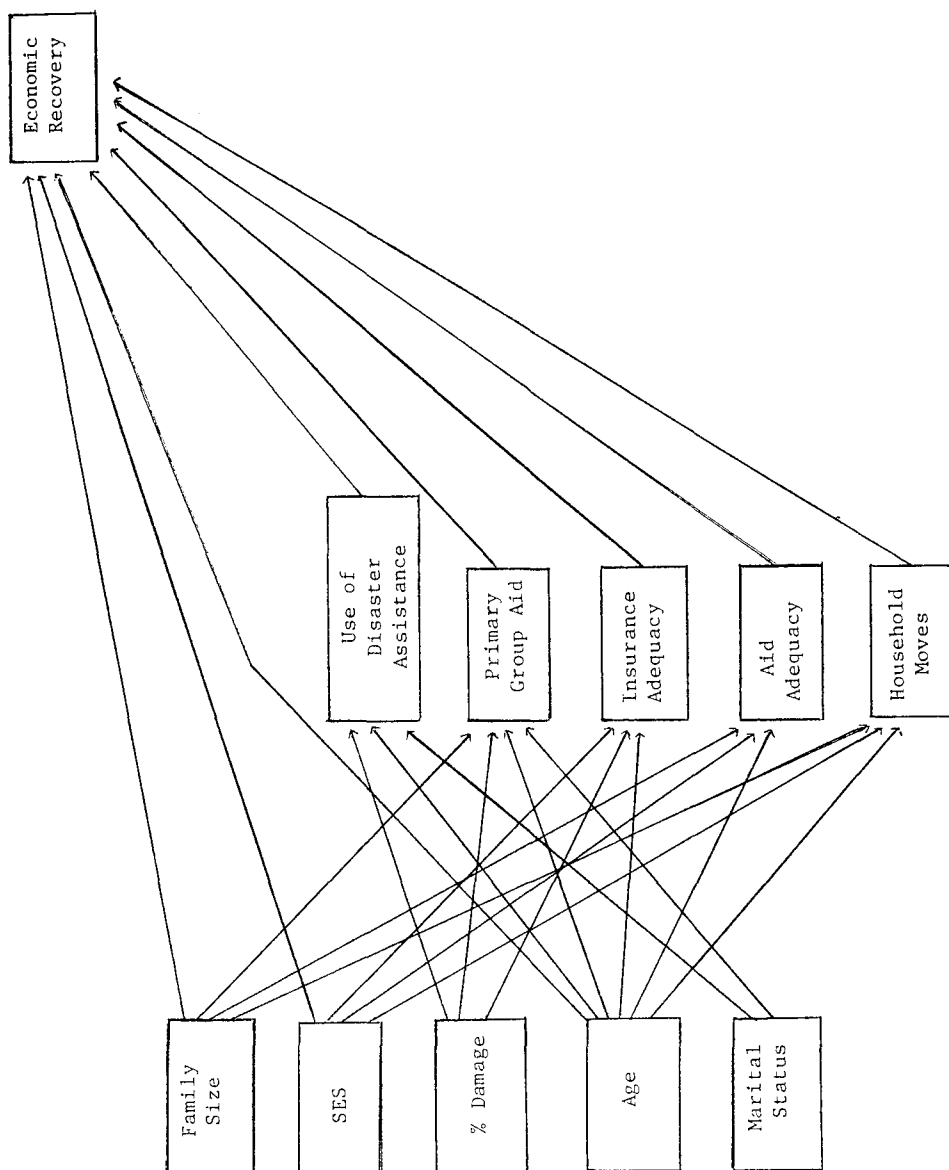


FIGURE III-2

RELATIONSHIPS IN PATH MODEL SUPPORTED BY DATA

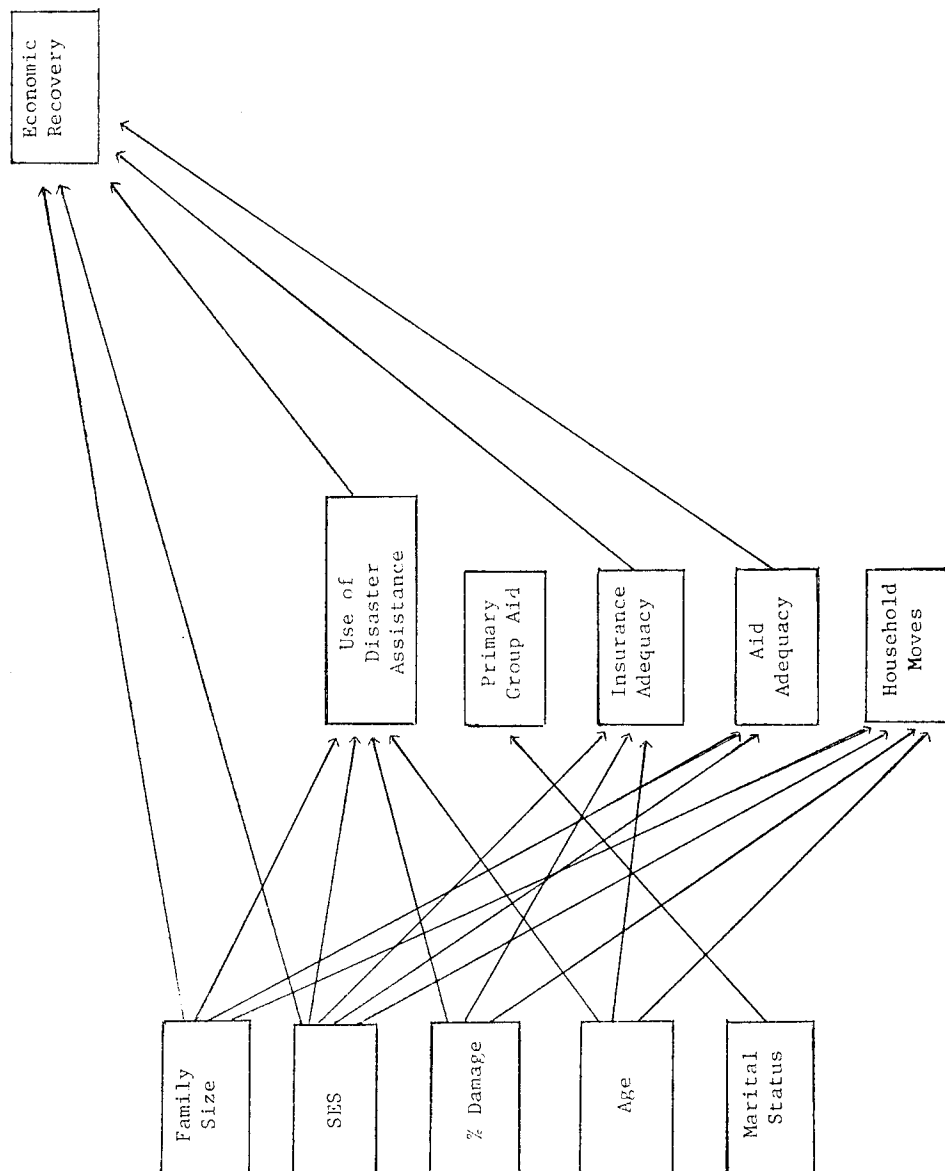


FIGURE III-3
RELATIONSHIPS IN PATH MODEL SUPPORTED BY DATA

victims (see Tables V-22 to V-26 for a comparative analysis of the other ethnic groups included in this report).

For each dependent variable in Tables III-23 and 24, there are significant convergences and divergences between blacks and whites. The use of disaster assistance for both groups is determined by disaster losses (% of damage) and age. Higher losses increase the likelihood of members of either group using formal aid, while, for both groups, older victims were less likely to use such aid. For blacks but not whites, marital status was positively associated with using assistance. On the other hand, larger white families were less likely to use formal aid, while those with higher socioeconomic status were more likely to do so. Neither of these factors were found important in affecting aid receipt for blacks.

Primary group aid for whites was determined by only one factor, marital status. Married whites were less likely to receive informal aid, indicating that marriage may function as an intrafamily social support. The same was found to hold for black victims. In addition, older blacks and those with larger families were less likely to receive informal support than other blacks. Damage levels, however, were found to be positively associated with receiving primary group aid; blacks with high losses were likely to turn to the primary group for assistance.

Insurance adequacy is determined by the same variables for both subsamples, but not always in the same way. Persons with higher socioeconomic status and higher losses were more likely to assess their insurance coverage as adequate. The fact that higher losses are positively associated with insurance adequacy reflects the fact that those with high losses tended to have their homes "written off" by their insurers and thus were able to build completely new homes with their insurance (see Bolin, 1982, for additional discussion). The divergence between the two groups comes with the variable "age"; older whites were more likely to have adequate insurance compared to other whites while the reverse held for black victims.

Two of the determinants of aid adequacy were the same for both groups. For both, large families were more likely to report having received inadequate aid, reflecting the greater needs of such families. Likewise, and perhaps ironically, families of higher socioeconomic status

were more likely to report receiving adequate aid. The data also indicate that older blacks were less likely to receive adequate aid than other blacks, and that whites with higher losses were more likely to report aid as adequate than those less severely affected (perhaps reflecting a similar dynamic to that noted for insurance adequacy).

The number of household moves was determined by the same three variables for both groups. Generally family size was positively related with number of household moves while socioeconomic status was negatively associated, indicating that larger families were more likely to change residences while those with higher socioeconomic status were more likely to establish a permanent residence soon after the disaster. Age was positively associated with the number of household moves for white victims, but negatively for blacks.

Looking at overall economic recovery as measured eight months after the disaster, the two samples are similar, but with a few divergences. For both blacks and whites, recovery is negatively associated with family size and positively associated with social class, disaster assistance, and the adequacy of aid and insurance payments received. However, as shown earlier, it was found that blacks were much less likely to have received adequate aid compared to whites. Given that the dependent variable is economic recovery, it is not surprising that socioeconomic and aid factors contributed heavily to variation in the dependent variable. The important divergences between black and white victim recovery are associated with the black model. The number of postdisaster moves was found to contribute negatively to recovery as was primary group aid. While, as shown earlier, primary group aid contributed positively to the emotional recovery of blacks, it was found to be negatively associated with economic recovery in the path model. This possibly suggests that in some portion of the sample, primary group aid was used as an inadequate substitute for formal aid, and thus had a negative association with economic recovery. In some instances it was the failure to qualify for aid sources that forced victims to rely on the primary group for recovery resources. Lastly, having to make relatively frequent postdisaster residential changes had a negative effect on black economic recovery, suggesting that the expenses involved prevented rapid economic recovery.

Overall, the two models of economic recovery show similar causal

patterns, suggesting that disasters create stresses on victim families that are generally uniform across social categories and that responses to those stresses are somewhat similar. The final chapter examines convergences and divergences in patterns of aid utilization and family recovery for all of the sites studied.

CHAPTER IV FLOODING IN UTAH

Introduction

This chapter presents an analysis of the Utah flooding of 1983, focusing on a small sample of victim families as well as a survey of organizations involved in aid and recovery. The disaster presented a unique opportunity to examine the relief and aid operations of a well established religious organization.

Because the Mormon Church (Church of Jesus Christ of Latter Day Saints [LDS]) is a dominant and affluent institution in Utah with a history of self-reliance among its members, research on the Utah floods differed from the victim surveys described in other chapters. The nature of the disaster itself also prompted deviation from the "standard" surveys; because flooding and mudslides occurred in numerous, sometimes isolated areas around the state, research was focused on the hardest hit Wasatch Front communities in Davis County north of Salt Lake City. In Davis County, 13 homes were destroyed and 40 sustained major damage. The studies reported in other chapters of this book involve far greater numbers of homes and higher levels of damage. In order to study recovery and aid, a significant number of subjects must have experienced losses sufficient to create a condition from which to recover. Because the number of victims in Davis County was small, it was decided to focus in-depth on some of the harder hit families. That information was supplemented by an examination of the role of the LDS Church vis a vis more traditional disaster aid organizations.

The Wasatch Front communities of Bountiful and Farmington were selected as the sites to be examined. Although a case study approach does not result in statistically significant conclusions, the experiences of victims and the organizational activities in these communities seemed reasonably representative of other flooded areas in the state. In addition, the opportunity to examine unique social and religious forces outweighed the need for statistical precision. Therefore, before describing methods and findings, a general description of the social and cultural features of the LDS Church in Utah is presented.

The Mormon Church

The LDS Church is intricately bound to the social structure, economics, and politics of Utah. The population of Utah is approximately 75% Mormon, and the church itself is rapidly expanding as a result of national and international missionary efforts (Campbell and Campbell, 1978). Additionally, the emphasis on large families as part of church doctrine results in an inevitable increase in church membership (Skolnick et al., 1978).

The features of the church most affecting disaster recovery are its structure and its involvement with the family and local communities. The complex hierarchical organization of the Mormon Church essentially requires all males to be active within the priesthood. There are two orders of priests (higher and lower), and each order contains a number of ranks which each priest ascends according to the amounts and types of church activities he pursues (Kephart, 1980).

The church is organized and administered both vertically and horizontally (O'dea, 1957). Horizontally, the key organizational entities, and those that figured most prominently in disaster response, are stakes and wards. Wards are a basic geographical unit consisting of, on the average, around 600 persons in a contiguous area. Each ward is administered by a bishop. All Mormons must belong to a ward (Kephart, 1980). The bishop, through reports of subordinates, is kept informed of possible needs or problems among ward families. Groups of wards are organized into a larger structural unit known as a stake. Each stake is directed by a president who in turn appoints ward bishops. Presidents, like bishops, manage their respective domains and attend to emerging problems (O'dea, 1957).

While the church has an elaborate hierarchy, a feature more salient to this research is the church's participatory nature. Starting at age twelve, Mormons begins taking an active role in ward and stake activities as well as in the symbolically significant temple ceremonies. Families in wards are periodically visited by traveling teachers of the church as well as their bishops.

There are annual and semiannual conferences and visits by the apostles. . . There are weekly social events and Mormon holiday celebrations. . . There are a host of subsidiary organizations:

women's relief society, young men's and young women's mutual improvement associations, scout troops, and Sunday school union, the Genealogical Society, the church welfare plan, and so on (Kephart, 1980, p.220).

All participation is voluntary, but participation rates are nevertheless high, creating an important social cohesiveness among members and maintaining an organizational structure in which large numbers of members can be mobilized in response to any untoward event.

A major focus of church doctrine is the strength and stability of the family. LDS members tend to have larger than average families and also tend to maintain active kinship networks well beyond the nuclear family, although three generation families are not more frequent than among non-LDS members (Campbell and Campbell, 1981). Families are encouraged to meet once a week (Monday night) for a "family home evening" (Campbell and Campbell, 1981), and on such evenings to engage in various recreational activities (Kephart, 1980).

Mormon families typically give 10% of their income to support the church ("tithing"). In addition, once a month families are asked to forgo a meal and donate the money they saved to the church welfare system. The church is therefore able to maintain stores in which Mormons may obtain foodstuffs and other items if they cannot provide them for themselves. Thus, although self-sufficiency is stressed (O'dea, 1957), the LDS church provides a support system for those who cannot provide for themselves.

This brief overview of the cultural and organizational features of the church illustrates the structures and networks that provide individuals and families with support and social cohesiveness. These features resulted in somewhat unique response strategies when the Utah flooding commenced.

Research Design

Eleven victim families in Davis County were interviewed in depth. Three lived in Farmington and eight lived in Bountiful. In addition, ten officials from disaster relief and emergency organizations were interviewed--two representing the LDS Church, one representing the Federal Emergency Management Agency (FEMA), one representing the State of Utah's

Department of Social Services' Individual Family Grant program (IFG), one representing Davis County Emergency Services, two representing the Salt Lake Area Chapter of the American Red Cross, one representing the Governor's Task Force on Flood Relief, and two representing the Salt Lake Area Chamber of Commerce's Flood Recovery Committee.

Instruments

Two in-depth interview schedules were constructed. One was administered to victim families, the other to organization officials. The victim interview schedule contained 104 questions, the organization schedule, 25. All questions on both interview schedules were open ended and designed to provide the maximum opportunity for respondent and interviewer to pursue issues in depth. All interviews were recorded on cassette tapes, transcribed, and their content subsequently analyzed.

Victim interviews asked basic family demographic characteristics: age and sex composition of families, family size, family type, residential history, and income, education, occupation, marital status, and religious affiliation of heads of household and respondents. A second series of questions asked victims to describe their flood experience--including events leading to and following the disaster, injuries, deaths, family disruptions resulting from residential dislocations, temporary housing, and repair work. That section also included questions relating to employment and effects of the floods on work patterns. A third series of questions asked victims to describe the percentage and dollar amounts of property losses to home, home contents, and vehicles. A fourth set asked about the amount and types of aid received from formal disaster relief organizations and from primary group members. In addition, victims were asked to describe how important each type of aid was to their emotional and economic recovery and how they felt about accepting such aid. A fifth series asked about home insurance coverage and the percent and amount of aid and insurance received from insurance and disaster relief organizations. A final set of questions dealt with the disaster's effects on health, family cohesion, day-to-day activities, neighborhood, community, family members' emotional well being and feelings of optimism and pessimism. In general, to permit comparisons, questions asked of the Utah respondents directly paralleled the questions used at the other sites.

Disaster relief organization interview schedules obtained information on the chronology of operations, services provided (including types of services, number of victims reached, and dollar amount of operations), the organization's outreach to victims, staffing, funding, community interest, coordination with other organizations, program assessment, and plans for program activities in the future.

Sampling

The representativeness of the sample relative to any larger group cannot be statistically determined. The interviews were conducted simply to gain insight into the effects of a strong, pervasive church organization on communities experiencing disaster. Potential respondents were selected from computer lists of victims supplied by the city manager offices of Farmington and Bountiful. Victims with moderate to total property losses were selected at random and contacted by telephone to set up interview appointments. None of the persons contacted refused an interview, and all of the appointments resulted in complete interviews. In three instances more than one adult was present for the interview; however, interviews were conducted so that in each of these instances, there was a single respondent who was designated as a representative of the family.

Those relief organizations typically present in disasters and those referred by other organization officials were selected for interview. Officials interviewed were those in charge of the disaster relief function for the Salt Lake-Davis County area for their respective organizations. They were contacted by telephone to set up interviews one to two weeks prior to the actual field visit.

Interviewing and Analysis

The project's research associate, an experienced interviewer, conducted all interviews. Interviews with both officials and family respondents were conducted during the last two weeks of September 1983, approximately three months following the floods and mud slides; they took approximately two to three hours to complete.

The cassette tapes of the interviews were transcribed, and the transcriptions were coded by preselected variables to provide summary statistics and descriptions. In addition, content was analyzed according

to subjects mentioned by respondents in order to identify and develop salient issues for further examination.

1983 Utah Floods: A Summary of Events

In recent times, Utah's climate has lacked moisture; it is an arid land with dry soils. Events leading to the extensive floods and mud slides in the spring of 1983 began in the previous September. At that time, northern Utah experienced an unusually heavy rainfall that saturated the Wasatch Mountains and did not dry before the winter snowfall began. During the winter, up to eight feet of snow accumulated on the peaks. Most of the principle cities of Utah, containing 90% of the population of the state, lie at the base of the Wasatch Front. In the spring, the mountains' snow usually melts slowly into the dry soil. However, a late thaw brought rapid melting on top of the already saturated soil. Consequently, heavy runoff and dislodged mud and rock poured into the drainage canyons and continued on toward the cities below.

Flooding occurred along the Wasatch Front from the beginning of April through the end of July. The first major flood began on April 12 in Thistle, a small town located about 60 miles south of Salt Lake City. Mud slides washed out roads and created a dam across the canyon in which Thistle was located. Flood waters filled the canyon to depths of up to 185 feet deep, and, by April 30, the 22 families living in Thistle had all been evacuated and relocated. They were still displaced by Thistle Lake at the time of interviewing. The lake and flooding in counties south of Salt Lake City not only displaced families, but also cut off hundreds of coal miners from their jobs.

The next major flood took place during the last week of May in Salt Lake City and directly to the north in Davis County (discussed below). As flood waters came down the mountains to the east of Salt Lake City, a major city storm sewer became jammed with debris. To save residences and businesses, flood waters were redirected to the Jordan River through two sandbag canals erected on city streets. One two mile-long canal was located thirteen blocks south of Temple Square. Another mile-long canal was erected on State Street in the heart of the central business district.

The last major flood occurred near Delta, Utah, when the D.M.A.D.

Dam broke on July 23. Two small towns, Oasis and Deseret, and other parts of Millard County were evacuated.

It is estimated that over 5,000 families were affected in some fashion by the spring and summer floods in Utah. Of the 29 counties in Utah, 22 received federal disaster declarations. All 22 were eligible for public assistance, and eleven were declared eligible for individual assistance as well. The first federal declaration came on April 30, and counties were added to this declaration through July as the flooding continued. Disaster Assistance Centers were set up in Spanish Fork, Ogden, Salt Lake City, Farmington, and Delta. The centers were supported by a state-wide hotline that could be used to apply for assistance.

Because of their dense population and the severity of their flooding and mud slides, three communities in Davis County just north of Salt Lake City--Bountiful, Centerville, and Farmington--were considered the hardest hit in Utah. They have a combined population of approximately 45,000 in a county of 146,000.

At the time of interviewing, the director of emergency services in Davis County estimated public damage at approximately \$15,000,000 and private losses at \$8,250,000. Damage to private residences included 13 homes totally destroyed, 40 homes with major damage, and 375 homes with minor damage. There were no deaths or serious injuries due to the flooding. Utility services were affected for short periods of time, and the water supply was affected for several weeks. In various areas water had to be shipped in or boiled.

The problems for Davis County began in the last week of May when an unusually cool spring ended abruptly with temperatures climbing into the nineties. Small creeks originating in mountain canyons suddenly overflowed and threatened nearby homes. Persons living along the creeks used sandbags to protect their homes, and geologists began flying over the canyons twice a day, looking for cracks and changes in the snow. In addition, on-site "technical committees" (groups of technicians monitoring streams) watched the creeks around the clock, reporting changes in water color and level. On May 28, Davis County Emergency Services activated a 24-hour staff.

Major flooding began on May 29 in Centerville and Farmington. Basements of homes were flooded, and roads, bridges and culverts sus-

tained damage. In the early evening of May 30, Memorial Day, a major mud, rock, and debris slide came down Rudd Creek into Farmington. It gathered a great amount of speed with its plunge, and when it reached the town, it knocked homes from foundations, and partially smashed or destroyed them. With only the actual mud slide to warn them, residents had little time to evacuate.

Later that night and early into the next morning, Bountiful was hit with major floods and slides from three canyons. The most severe mud slide came from Stone Creek; water entering the town eroded roads and culverts and eventually formed a 30-foot high wave of mud and water. The slide of rock and debris cut a gorge 50 feet deep and 150 feet wide in some areas. As it came down the creek, it smashed some homes, filled others with mud, and knocked down a power station, cutting off power and communication in Bountiful. Some victims were warned to evacuate by neighbors and friends, some were warned by the police, and others received no warning. They were awakened by mud smashing into their homes.

A total of approximately 200 to 300 people were evacuated from the three affected cities (Committee on Natural Disaster, 1984). One evacuation center was set up at Farmington Junior High School. The location of evacuation centers in Bountiful had to be changed several times to avoid flood paths and lack of utility service--a center finally being established at Woods Cross High School in a city adjacent to Bountiful. Less than half of the evacuees stayed overnight at the centers. LDS bishops were present at the centers to relocate victims to emergency housing in the homes of church ward members. In addition, residents of two nursing home facilities were temporarily evacuated to a Council on Aging Center. At these centers, the Red Cross provided necessities and set up mass feeding operations.

After the initial emergency period, debris removal and cleanup by public agencies and the LDS Church began. The cleanup of private homes was, for the most part, accomplished by volunteer LDS work crews. At the same time, disaster relief organizations began operations to provide victims with longer-term assistance. The federal government provided support for temporary housing, household necessities, and furniture through the Federal Emergency Management Agency (FEMA) and low interest loans through the Small Business Administration. Individual Family

Grants were made available through Utah's Department of Social Services. The American Red Cross provided emergency assistance and then entered into its Additional Assistance Phase to provide support for major repair and rebuilding of private homes.

A number of new disaster relief groups emerged to provide stricken families with assistance not available from other organizations. The LDS Church provided several types of aid, including money, labor, household necessities, and emotional support. The governor of Utah organized a Task Force on Flood Relief to coordinate the activities of the various disaster relief organizations providing assistance to victims state wide.

The response to the disaster, both organizationally and in terms of volunteers, was the result of planning and monitoring by federal, state, county, and local organizations that began a number of months prior to the actual flooding. The potential for flooding in the Wasatch Front has been recognized for at least 15 years (Committee on Natural Disasters, 1984). This awareness has led to numerous preparedness activities and the designation of a full-time flood control director in Salt Lake County.

Contingency plans were in place, and flooding potential had received wide media publicity for several months prior to the actual flooding. Thus equipment, materials, and personnel (both voluntary and paid) were ready and easily mobilized in Salt Lake City and the cities of Davis county (Committee on Natural Disaster, 1984). The Mormon Church, as will be seen, was of key importance in mobilizing volunteers for both emergency period activities (sandbagging, etc.) and for clean-up in the aftermath. The church not only used its organization of wards and stakes to mobilize volunteers, it also developed an active media campaign.

It was this preplanning of hazard response by organizations at all levels as well as the ready recruitment and management of volunteers that restricted the potentially devastating damage of the floods and mud flows in Utah.

Findings: Effects on and Responses of Victims

Demographic Characteristics

The 11 victim families were interviewed in-depth in September 1983.

The majority of respondents (seven) fell between the ages of 30 and 59. One respondent was under 30, and three were in their 60s. All of the respondents were married, except for one who had been divorced just prior to the flood.

All of the respondent families could be described as having middle socioeconomic status, although monthly take-home income for the families ranged from \$200 to \$2,500, with a median income of \$1,780. The low income of \$200 could be attributed to loss of employment rather than to persistent low socioeconomic status. The head of that household had some college education and normally was employed at a higher occupational level. Income loss related to the disaster was not a problem for any of the respondent families except for one elderly head of household who chose early retirement in order to have time to rebuild his home. In three households, one spouse was employed, and in two households, both spouses were employed. Of the six households without employed members, four heads of the households were retired, one was disabled, and one unemployed.

All heads of household had at least a high school education with eight having some college, a college degree, or post-graduate education. In terms of occupation or former occupation of the heads of household, three held professional positions, four were in managerial positions, two were in skilled services and sales, and two in unskilled services and labor.

Six of the respondent families had at least one child under 18 year old in the household, while the other five families contained only adults. Family sizes ranged from two to nine members. Four families had two members, four had three or four members, and three families had over four members.

The cities of Bountiful and Farmington are predominantly Mormon. Nine of the respondents were members of The Church of Jesus Christ of Latter-Day Saints (LDS), and all of the LDS respondents were active in their church and considered religion very important in their lives. One elderly man was not active in the church but still considered religion somewhat important.

Impact and Response

Material losses experienced by victims were divided into four types:

housing damage, home content losses, losses of personal possessions, and damage or loss of motor vehicles. Respondents estimated the percentage of damage to the structure of their homes and yards and the dollar amount needed to repair or replace them. Typically, estimates were based on estimates already prepared for disaster relief agencies. All of the respondent families owned their homes, and several had paid-up mortgages. They had lived in their homes anywhere from two to 43 years, with a mean of 15 years. Similarly, they had lived in their communities from ten to 53 years, with an average of 24 years.

Regarding estimated home and yard damage, one family lost less than 50%; six families lost from 50% to 90%; and four families had their homes completely destroyed. Dollar losses to houses and yards ranged from \$13,000 to \$125,000, with a mean of \$54,000. Three families had less than \$20,000 damage, three families had \$20,000 to \$50,000 in losses, and five families sustained over \$50,000 in damage.

Structural losses may have been more severe than one might normally expect from mud slides and flooding of this type due to housing styles in the Davis County area. Except for the four houses that were totally destroyed, damage was limited to yards and basements. However, in that area it is fashionable to entirely finish basements into bedrooms, family rooms, and work rooms. The homes of all of the families interviewed had completely finished and furnished basements, and damage restricted to the basement, therefore, resulted in significant losses.

Damage to respondents' home contents and furnishings were lower than that reported to home structures--both proportionally and in absolute dollars. Three families lost less than 50% of their contents; seven lost from 50% to 99%; and one family lost 100%. Dollar losses ranged from \$2,000 to \$50,000, with a mean of \$19,000. Three families had less than \$5,000 in losses; four families had \$5,000 to \$25,000; and four families sustained losses of over \$25,000.

Loss of motor vehicles was substantial. Almost half of the respondents reported cars or motorcycles so severely damaged they could not be used, and losses ranged from one to four vehicles per household. Dollar losses ranged from \$100 to \$6,000, with a mean of \$1,660.

Respondents were asked about the loss of mementos or personal possessions--losses that were particularly upsetting. Since it is difficult

to place dollar values on losses of this type, respondents were not asked to estimate value, but rather to discuss the loss. Although all respondents reported losses of this type, the kinds of items mentioned varied greatly. Interviewees typically mentioned antiques, photographs, genealogies, travel souvenirs, family heirlooms, awards, musical instruments, and valuables, such as furs, jewelry, and art. Many respondents thought of these items as irreplaceable pieces of their lives. For example, one elderly man spoke of his loss saying,

And I had my mother's--she's been dead since 1945--I had her kitchen table down there and three chairs. They were battered up. Sure, they were old. I have no family left. I'm the only one left in my entire family. . . So that was important to me.

Others mentioned the loss of lawns, flowers, shrubs, and trees. One woman described her yard and the years of work and effort put into it:

We had a beautiful stream in our backyard. . . The house was okay, but it was actually the lot, why we bought it. And my husband had spent four years lining the creek with rocks--just beautiful--even the streambed. (We) made little waterfalls and things and had all these trees. . . Everything--those stone-lined things I told you about--they went the first day. . . And we kept losing the banks all that week, and our trees kept falling in.

All but one of the families managed to save their pets. The mother of that family described how the loss affected her teenaged son:

My youngest son really hasn't shown any emotion at all. . . When we got home he was so worried about the dog, and everyday he'd call the dog pound. And I kept saying, 'She's run away. . . She was a real good dog. Somebody probably found her.' He was there. He found her. . . He'd just look at the dog and walk off and then come back and look, just to make sure it was her.

Although respondents felt a sense of loss for sentimental, personal possessions, they also clearly valued their families' safety over the loss of "material things." In describing her feelings, one mother of a large family said, "When we drove down the street and had all of our children. . . I just knew in my mind that our house was gone. . . We were so thankful that we escaped with our lives and our children that at that point we made the decision that the rest didn't matter."

Respondents were asked to compare their losses to those of other persons in the area who were affected by the flooding. Seven respondents felt "worse off", four felt "better off", but none felt that their losses were the "same" as others. Of the four respondents who felt "better off," two were the only ones among those interviewed who had flood insurance. Interestingly, another woman who felt "better off" had her home totally destroyed. She explained,

Well, some of the homes were. . . covered with mud in basements, and so they lost a lot of things, and it was such a terrible mess. Then they have to muck it out, clean it, and restructure it. So in some ways I'm better off starting out new--with everything new. I even feel guilty at times because I didn't have mud in my home.

Personal Injuries

In Davis County, there were no deaths and only minor injuries related to the disaster, and none of the respondents knew anyone who was injured. Therefore, this group of respondents did not have to deal with the psychological and social effects of death and injury and their attendant family disruption. However, many of those interviewed recounted experiences that came very close to resulting in death and injury. In Farmington, where the mud slide occurred in the evening, one woman talked about her fears of what could have happened if it had occurred later. Her children and a grandchild were staying in the house while she was vacationing. "Well," she said,

when we went digging in our bedroom, we found the rocks that broke in through our bedroom. . . ripped the headboard off our bed, and that's where they (her daughter and son-in-law) would have been sleeping. The baby's bassinet was just bits and pieces of wicker. . . if it hit at night, we'd lost them all.

Another elderly man described his escape from his house which was hit by a mud avalanche:

The only means of escape was across that bridge in the front of the house here. There's no other doors or exit that we could get out. The mud was already gushing in every room of the house. . . My wife slipped and fell. . . and I had to reach down and grab her. . . we struggled our way on out to the street. . . by some miracle that bridge withstood that terrific impact that hit it.

Residential Dislocation, Psychological Impacts

The cities of Bountiful, Centerville, and Farmington lie at the base of the Wasatch Mountains. Flood waters of melted snow came down those mountains, picking up mud, trees, rocks, and other debris. The waters followed the paths of normally gentle creeks into the cities where homes lined those creeks. The extent of damage to individual homes depended on proximity to the flood path, location relative to path bends, and the amount and type of debris being carried. Therefore, there was great variation in the damage sustained by individual homes. Some homes had water in the basements, others were inundated with mud, while still others were knocked from their foundations.

In most instances, affected neighborhoods were evacuated for the night because the situation was unpredictable. Afterwards, a good number of families were left with uninhabitable homes because of structural damage and/or the mess created by the mud. Many families had to find emergency shelter, and some had to find longer-term temporary housing until their homes could be cleaned, repaired, replaced, or new permanent housing could be obtained.

All of those interviewed had to leave their homes for at least one night. Temporary residential changes ranged from one to seven moves, with most families moving two or three times. The typical progression of moves was a first night's emergency stay in a shelter or the home of family or friends, a short stay with family or friends, and then a longer stay in private, temporary housing. At the time of the interviews, (approximately five months after the flood), five families were still not living in permanent housing. Four of those had their homes totally destroyed and had not started building new homes. The other family had their home nearly destroyed and was in the process of rebuilding it.

Nine families lived in temporary housing for at least two months. Two families moved back to their damaged homes almost immediately following the flood, even though living conditions were uncomfortable; mud remained in the lower levels of the homes, and some utilities were not in service. One of these respondents did not want to leave his home unattended, and the other wanted to live on site so that repair work could be continuous.

Emergency shelters were set up by the Red Cross and LDS Stake

Houses. Three respondent families made use of these shelters from one to three nights. Two (both LDS members) went to LDS Stake Houses, and one non-LDS member went to the evacuation center. All of the respondents had the problem of not knowing where to go once they evacuated their homes, whether they left of their own accord or were officially evacuated. Of the three who went to emergency shelters, two said that they stumbled on them, and the other said he was given the information by a policeman directing traffic. Other respondents said that the police would not let them stop for information. Most drove around making their way through roadblocks and flooded streets until they could reach the homes of friends or relatives. Of the eight families that did not use public emergency shelters, two went to the homes of friends and six stayed with relatives.

In the course of their moves, nine families ultimately ended up staying with relatives, usually their parents or children, and two stayed with friends. These stays ranged from several days to six weeks. Seven respondents reported that their families had to split up at some time during their moves while longer-term housing was being secured. Of the nine families that had to find this type of housing, one stayed with parents, three rented apartments, and five rented houses.

Subsidies for longer-term temporary housing were available to victim families through FEMA. Of the nine who needed long-term housing, one did not qualify because the family stayed with relatives. Three families had their rent partially subsidized by FEMA, and initially, four families received full subsidies from FEMA. However, one of those families had their subsidy withdrawn by FEMA after two months. That respondent reported that FEMA told them that because their destroyed home had a paid-up mortgage, the family could afford to pay their own rent. The respondent said he felt "betrayed," because a temporary house had been rented and financial plans for rebuilding had been made based on FEMA's promised support. One family refused temporary housing support even though they qualified for it. That respondent explained, "Because the government had its own problems. I mean, they're trying to take care of a lot of people. We thought by doing that, that we could help other people, and then if we needed the help, we could call them."

For two principle reasons, FEMA did not bring in mobile homes for

temporary housing in Davis county. First, only a small percentage of county residents were affected by the flooding, and second, sufficient rental housing was available in the area to meet the needs of victims.

As was discussed in Chapter II, the frequency of residential changes and the fact of living in temporary housing have both been found to have emotional/psychosocial effects on families (see, for example, Gleser et al., 1981). Respondents were asked to discuss the disruptions that their families experienced in making residential changes. Of the ten families who made significant changes (one couple was away from their home for only one night), six said that the disruption was extreme and four said that it was moderate. The number of residential changes did not appear to be associated with each respondent's assessment of disruption.

The most frequently mentioned disruption was families' having to split-up and stay in different places. This was particularly difficult because they felt they were in a crisis and wanted to be together to support one another. Another frequently mentioned disruption involved the loss of belongings necessary for day to day life; victims were expected to carry on routine activities without those essential belongings. Other disruptions were caused by the work involved in moving, the difficulty of making friends in new areas, and the anxiety of having unattended homes and property.

Respondents were also asked to assess and discuss the disruptions caused by living in long-term temporary housing. These circumstances did not appear to be as disruptive as the residential changes. Of the nine families who lived in temporary housing, two said that the disruption was extreme, four said it was moderate, and three said that it was slight.

The most frequently mentioned positive aspect of temporary housing was the privacy it afforded families in crisis. One woman explained,

I just could not have lived with other people because we were upset as it was. And, when you go in with other people, you feel like company, and it's disruptive in itself, for them and you. . . I would have died if I hadn't of had a place to go to be alone.

Other positive aspects mentioned were proximity to the damaged home, safety in the new locale, and the ability to keep belongings and family together.

The negative aspects of temporary housing that were mentioned included the loss of and difficulty in managing belongings, and the sense of impermanence and never feeling "settled in." A young woman (the only one to find long-term housing with relatives), although appreciative of her parents' help, described what it was like to live with them:

"You don't go back home, after living 18 years away, with three kids and a big dog. . . It's little things that really get to you. Mother would come home [and say], 'Where is this, I never put that there'. . . I wanted to be good. I was again the little child."

Because only the basement levels of many homes were damaged, six families were able to live in upper levels while repair work was in progress. All, however, found that situation disruptive. One common problem was a desire to restore such homes as soon as possible; the families seemed to feel that only then could normalcy be restored to their lives. One man described the effects on him and his wife: "Terrible, terrible, we couldn't sleep, just could not sleep. We sat here, we'd get up, listen, we'd go to bed. . . in an hour or two we was wide awake, couldn't sleep, and so we'd get up. . . It went on like that for weeks." Another man explained that his zeal to finish repairs resulted in mistakes and delays. "It's been a pain," he said,

because I'm not a carpenter. . . I wish that I would've taken time. Like I just worked here day after day, and I got more and more frustrated. I got working on something all day long, and then I'd find out that I should have done something else first, because I was going to screw up what I'd just done.

Other common frustrations included the constant dirt and the necessity of the family having to live in cramped quarters.

Respondents were asked to discuss disaster impacts on aspects of their social lives including changes in visiting patterns with relatives and friends, changes in leisure and recreational activities, and changes in neighborhood relationships.

Of the 11 respondents, eight reported that visiting patterns had not changed as a result of the disaster experience, one reported increased visits, and two reported decreased visits. Most of those reporting no change attributed the stability of those patterns to the LDS Church. In

order to remain active in the church, members are obliged to participate in church activities and routines. Therefore, even though victims were undergoing dramatic disruptions in other aspects of their lives, obligations to and activities within the church provided stability.

In contrast to this stability, eight respondents reported that their family's leisure and recreational activities were severely curtailed, while the remainder reported that they had not changed. Of those reporting negative impacts, most attributed the curtailment to limits on time and economic resources; families concentrated their efforts on repairing and rebuilding homes and had little time or money available for vacations, sports, club activities, or nights out. Most said that they "just worked." One young man felt that limiting all of his time to working on his home may have been a mistake:

That would be what I'd do differently, if I had to do it again. I'd do as much as I could for awhile then go and have a leisure activity. . . I think that was the frustrating thing [missing leisure activities]. . . Then instead of doing it [working on the house] because it was important to me, I was doing it because I had to, and then I would get mad.

Most of the respondents felt that the disaster experience had a positive impact on neighborhood relationships. Nine felt that relationships had become closer, one felt that they had become strained, and one said they remained the same. The closer relationships appear to be the result of neighborhoods working together to protect property and lives. One woman explained that since her family is not LDS, they did not know their neighbors prior to the flooding:

We feel better about it. We know people now, whereas we didn't know them before. . . by us not being active in their church. . . I never could get the people straight. I didn't know who lived where, and so now we do know. It's amazing.

For those who shared LDS membership, relations became even closer. One woman church member reported,

And, even though we lived there for some time and we were all good friends, we weren't that close. But now we're really close, like sisters and brothers, practically, and we look out for each other.

Victims families experienced considerable economic hardship due to the flooding. Because Davis County was not designated as a flood area, National Flood Insurance could not be obtained, and few families had private insurance covering floods. Most families depended on public and private aid to cover losses, as well as their own incomes and savings. Two of the families interviewed had obtained flood insurance from Lloyd's of London. However, their insurance did not cover all of their structural losses nor did it cover any home content losses.

None of the respondent families had members lose their jobs as a result of the flooding. However, one elderly man retired early so that he could devote his time to rebuilding his home. In two other cases, a construction worker chose not to pursue jobs, and a physician closed his office for a short time so that they could work on their homes. In these situations, the families lost considerable income. Two female spouses quit work for short periods of time so that they could tend to their homes. One was compensated for the time by her employer, and the other was not. Only one member of the respondent families obtained an additional job to help cover losses.

Respondents were asked to discuss the impact of the disaster on several areas of family functioning: disruption of family routines, family stresses and strengths, and lasting effects still present at the time of interviewing (approximately three months after the flood).

As discussed above, the majority of respondent families experienced disruptions resulting from residential changes, temporary housing, and repair and rebuilding of homes. It is not surprising, therefore, that these disruptions, along with property losses, would affect family functioning. All of the respondents reported that their families' day-to-day routines were disrupted, and only one respondent felt that they had returned to normal at the time of the interview. There was great variety in reported disruption of family routines, with many disruptions centering on time and financial constraints resulting from the flood. Other disruptions mentioned included the sense of living out of boxes, hassles with aid officials, the time spent traveling to the damaged home, children's loss of playmates, and the suspension of leisure and family activities.

The disaster experience appears to have strengthened family ties for

the majority of respondent families. Seven reported closer family ties, three said that the disaster had no affect on family relationships, and one said that relationships had worsened. A young woman explained how the loss of their home strengthened her family relationships:

It's been something very positive in our life. It's reaffirmed our love for one another. . . We know that we're important to each other and more important than house or other things. . . I think it's nice to have a point in your life where you decide what is important. I don't think a lot of people ever face that. . . We know basically what we want, what happiness is, so other things, we'll get through them. We'll figure this out. We'll work on it.

Most respondents spoke of closer family relationships occurring in the long run, while recognizing that the experience did cause tension among family members at times. Typically, arguments centered on what to do about the situation and on what work should be done and who should do it to repair and rebuild homes. One woman complained that it was difficult to make her teenagers understand that they had to give up some recreational activities in order to help with the clean up and repair. Another young respondent described the tension between him and his pregnant wife:

I wanted to get the house done for her, so she could get back in, but she wanted me to spend more time with her, so I'd get frustrated. . . and she'd get frustrated because I wouldn't take time for her. . . I kind of felt sorry for myself because I was here doing it all by myself. . . And I forgot that she couldn't be here. . . And as I saw the house, little-by-little, improving, she never saw it improve.

Respondents were asked if their families were still feeling effects of the flood at the time of interviewing. All of the respondents mentioned negative residual impacts. The most frequently mentioned negative impact was that family life was still not back to normal--work still had to be done on repairing and rebuilding their homes. Other frequently mentioned impacts were inadequate housing, waiting for city drainage and street repairs to complete yard repairs, financial problems, debris and dirt in homes, lost possessions, and lingering emotional effects. A woman described the day-to-day effect of lost possessions: "Of course, we feel the impact. Every time I go to get something, I realize that I

don't have it anymore. And that comes up almost daily. That's going to be hard for a long time, yes."

Residents were also asked to discuss several types of psychological/emotional impacts on their families, including: emotional strain, storm anxieties, disaster impacts on children, and feelings of optimism/pessimism about the future.

All of the respondents reported that they experienced emotional strain at times following the flood, and all but one respondent reported emotional strain at the time of interviewing. Three respondents received formal counseling for disaster-related strain, two at a mental health center and one from a private psychologist. All three had terminated counseling by the time of interviewing, but they still complained of emotional strain.

When asked to discuss what they personally did to reduce such strain, the majority of respondents mentioned "work." One man explained how working on his damaged property helped:

You work. . . let's put it this way, your yard is full of mud, your basement's full of mud. And I suppose that your goal, your immediate goal is to get the damn mud out to the streets, where somebody will haul it off. . . Your long range goal is to put it back like it was before. . . And the closer you get to reaching that particular goal, the less emotional strain you have.

Other strain-reducing techniques mentioned were not thinking about the disaster experience, getting away from the house and the work, and participating in sports and religious activities. Only two respondents mentioned talking over their problems with family and friends.

Eight families had returned or were planning to return to their former homes or home sites; all expressed concern for personal or property safety. Two said that they wanted to sell their homes, and that if they could not sell them by the following spring, they would not live in their homes during the spring thaw. One woman explained,

I will not be able to be here in the spring. I'll either have to be on vacation or moved. I couldn't sit here and listen and wait again. Now I know what the neighbors have felt for all these years. I can't go through it again.

Although others made the decision to remain in their homes, they did admit to anxieties about having their homes damaged again or their families injured. Three families had their homes totally destroyed and their property bought by the city as a site for construction of a remedial catch basin. Understandably, those persons said they would not have wanted to rebuild on their former home sites.

Only two respondents reported anxieties during rain storms. However, five respondents said that they still had nightmares about the flood. Some dreamed of cleaning homes and shoveling mud. Others had more emotional dreams. A woman described her recurring nightmares:

They told me the mud was coming and I'd holler at the kids to come on, and you know how kids are, 'just a minute, I'm coming,' and they wouldn't come. The mud was and they wasn't. . . I'd be trying to pull them out, and they kept sinking, and I couldn't get them out of the mud.

Four respondents had only adult children. However, three reported that their adult children were still feeling the effects of the flood, even though they were not directly involved. The effects were manifested primarily in emotion and anger over the loss of family home and possessions. Of the six respondents who had minor children, two said that the flood had no lingering effects on their children, two were not sure if their children had been affected, and two thought that their children were still feeling its effects. One woman said of her teenage children

They don't want people asking them about it. They just want to be normal Joes. . . They don't like that label (mud slide victims). . . Adults enjoy that, some really enjoy it, but teenagers don't want to be victims. . . They don't want to stand out.

Respondents were asked to discuss their family's future--whether they were optimistic or pessimistic. Eight felt optimistic, two felt pessimistic, and one held mixed feelings. The most common sources of optimism were that they were actively restoring their homes, that they were taking precautions against future damage, and that they had confidence in their ability to handle another disaster. One woman felt that things could only get better:

When you're at the bottom of the barrel, the only way out is up. They've got to get better, they can't get worse. . . I think that if you're stuck in one place, and you're stuck there permanently, that's your own fault. I think if you want to get out of something, you can work at it.

Both of the respondents who felt pessimistic about their future were elderly. One thought her home would be flooded again with the next spring thaw. The other had problems in several other aspects of her life, and the loss of her home was the additional life event that made her feel hopeless about the future.

Findings: Aid Utilization and Recovery

A number of aid programs and services were available to victim families in Davis County. National level agencies and organizations included the Federal Emergency Management Agency (FEMA), the Small Business Administration (SBA), and the Red Cross. At the state level, Individual Family Grants were administered through the State of Utah's Department of Social Services. The LDS Church provided aid and services primarily at the ward and stake levels. Local community and emergent flood organizations included Chambers of Commerce, service groups, the Governor's Task Force on Flood Relief, churches, merchants, and employers.

Respondents were asked how they found out about the available disaster aid programs, and a majority of respondents said that they were informed by the LDS Church. When reviewing cases for LDS aid, ward bishops and stake presidents typically informed victims about the presence and location of the Disaster Assistance Center. Most respondents also received information about available aid through the media; newspapers appeared to be the most frequently consulted source. Other information sources mentioned were kin, friends, insurance agents, and officials at the evacuation centers.

FEMA set up a Disaster Assistance Center (DAC) at Farmington Junior High School for victims in Davis County. Major disaster agencies and organizations, including FEMA, SBA, IFG, Internal Revenue Service, and the Red Cross, had tables at the DAC. LDS was not present formally; although respondents reported that ward bishops were present and giving informal advice and information to their ward members.

All of the respondents reported that they went to the DAC in Farmington at least once. Seven said that they had no problems getting to the DAC, nor did they have any problems understanding available programs or applying for aid. The four who did have problems most frequently mentioned confusion about exactly who was eligible to apply for programs (e.g., how could an individual apply for a Small Business Loan?), questions about family resources and losses that could not be immediately answered, disappointment over the amount and types of aid available, and frustration over the impersonal, routinized way that agencies dealt with victims.

Formal Aid

Although many organizations were involved in providing aid to victims, only the most frequently mentioned organizations are considered here. These were FEMA, SBA, IFG, LDS, American Red Cross, and local community and service organizations. Respondents were asked to list the organizations from which they received aid and to describe the types of aid they received. They were also asked if they found any of the programs unsatisfactory.

FEMA provided two types of aid to victim families: financial support for temporary housing and aid to meet individual needs. Subsidies for temporary housing for up to one year were provided for those who qualified financially and needed rental housing until their homes were repaired or rebuilt. The amount of support was based on family size and need. No support was given to those who chose to stay with family or friends. Available rental housing in the area was utilized, and it was not necessary to bring in trailers.

Aid to meet individual needs included money to begin the process of cleaning and repairing homes. This included providing necessities such as cleaning supplies, electrical supplies, hot water heaters, and furnaces. In addition, furniture packages were loaned with the option to buy at minimal cost.

Nine respondents received aid from FEMA. The type of aid most frequently received was temporary housing (seven respondents). Three respondents received furniture, three received water heater repair or replacement, two received living kits (mops, brooms, plates, utensils, etc.), one received a refrigerator, one received bedding, and one re-

ceived electrical fixtures.

Two respondents found FEMA unsatisfactory. One respondent who was handicapped was offered support for temporary housing, but FEMA made no effort to assist her in locating such housing--a task she was unable to perform herself. She therefore felt she had no choice but to live with her parents until her own home was repaired. FEMA gave her no other assistance. Another respondent felt "betrayed" by FEMA. FEMA approved support for temporary housing for her family for one year, but then withdrew from the agreement after only two months. According to the respondent, no explanation for this action was offered by FEMA officials.

For families who could qualify, SBA offered low-interest loans up to \$50,000 to repair and rebuild homes. At the time of the interviews, eight respondent families qualified for loans, but only two families had decided to accept them--one for a small amount and one for the maximum amount. Two others were still not sure if they would borrow the money. Of all of the formal aid programs, SBA was most frequently criticized by respondents. The three families who did not qualify for loans wanted them and thought that they had been treated unfairly. They complained that SBA was inflexible and had not considered the special circumstances of their cases. The six families who qualified for loans but had not accepted them at the time of the interview felt that interest rates were too high, and that they could not afford the loan on top of continuing mortgage payments. Other problems included required detailed inventories which were difficult to compile, the temporary status of caseworkers that resulted in having to deal with someone new at each contact, and the long waiting period before receiving any money. One young woman explained her frustrations:

You know, they want down to a bobby pin what was lost in order to get any financial assistance or anything and you can't do that. . . . They want you to rebuild and get back in so that they can spend less money on you, but they won't give you any money so that you can do that until you answer their questions, which you can't answer. . . . They could've even come over and look. . . . The place is a total wreck. 'We don't live like this normally, sir. We need some help.

While sharing the cost with the federal government, the State of Utah, through its Department of Social Services, administered the Family

Grant Program. Grants up to \$5,000 were awarded to victim families, contingent upon needs and financial resources. IFG is a program of last resort; victims must have exhausted other resources and programs to be eligible for a grant. Thus, to receive IFG aid, victims first had to apply for an SBA loan. If they received a loan or were turned down for a loan, they were eligible for a grant. However, if they did not accept a loan after qualifying for it, they were disqualified.

At the time of interviewing, only one respondent had received a grant, three were initially disqualified, and three were disqualified after refusing SBA loans. Four applied for grants but never heard about the disposition of their applications. Not being able to get information on the status of applications was the major criticism leveled against the IFG program.

LDS provided aid to victims through the organizational lines already mentioned. Each ward was expected to take care of its own members affected by the disaster. If this proved too burdensome, the bishop could go to the stake president for assistance, and the president in turn could appeal on up the church organizational ladder. No new committees were organized to deal specifically with the disaster, and at the time of interviewing, no extraordinary funds had been allotted from general church funds for disaster relief. LDS administration made recommendations to bishops and presidents concerning disaster relief, but no specific directives were handed down. Aid and services were available to both members and nonmembers of the church.

All of the respondent families received aid from the LDS Church. Of the programs considered here, LDS provided the greatest variety of aid. Before the actual mudslides, it provided large work crews to sandbag and protect homes; during the emergency, it provided victims with shelter, food, clothing, and other necessities; and afterwards, it was particularly important in providing work crews to help remove mud and clean homes. In fact, all of the respondents, except for those with totally destroyed houses, had LDS crews clean and remove mud from their homes. In describing the mud removal and cleaning process, one woman said,

One Sunday, right after all of this happened, to get the mud out they had a bucket brigade. . . They just kept shoveling the mud

right into the buckets. . . and they were throwing it out of the family room downstairs window.

Another man said,

They came and first it was the teenage kids that came and they squirted it down. . . and then the women came and scrubbed it up, and then the men came down and disinfected it free. In about a day and a half it was fully done.

These work crews also helped victims to salvage and store their possessions.

In aiding victims to recover losses, LDS provided building materials, repair labor, money, other items (such as grass, sprinkler systems, carpeting) as well as emotional support. Most of the respondents whose homes were not totally destroyed received some help from LDS in repairing their homes; however, there was great variation in the amount and type of help received. Labor ranged from small jobs to major repairs, but the amount and type of work received was not associated with the amount of damage sustained.

LDS offered to rebuild the homes of the four respondents whose homes were totally destroyed. Church aid was to include both materials and volunteer labor, but at the time of interviewing no planning or work had begun on any of the homes.

Most of the respondents were grateful for the help that they received from LDS. Without this aid, much of the cleaning and repair work already done would not have been accomplished. However, not all were completely satisfied. A few respondents felt that the volunteer workers were not sensitive to doing the work the way the owner wanted it done. One woman said that she felt like a "prisoner" of the volunteers. Volunteers kept coming to help and she never had time to rest. LDS had promised help in repairing their home to one non-LDS family but never fulfilled its promise. The respondent for that family was angry and disappointed:

They were there for awhile, but then they continued to say how their building program was so good and everything. . . it (the disaster) got low keyed and everybody started putting their homes back together. . . then we could ask for something and somebody else would get it, but we wouldn't.

The Red Cross provided many types of aid to disaster victims in Davis County. Particularly important were mass feedings, emergency shelters, and aid to individual families. Only five respondents received aid from the Red Cross. Types of aid included food, clothing, cleaning supplies, furniture, and bedding. Red Cross aid was most important during the emergency period; it did not provide significant aid during recovery once the critical emergency had passed.

Community, service, and church groups (non-LDS) also organized relief funds for disaster victims. In some cases, those organizations had funds and therefore acted to disburse the money to victims; in other cases, they organized efforts to solicit funds for victims. Six respondents received aid from such organizations. Types of aid received included clothing, children's toys, money, furniture, and yard items. In addition, employers helped two of the families by providing labor for sandbagging and clearing property. Five respondents received aid from local merchants in the form of free merchandise and discounts.

Respondents were asked to discuss the importance of aid programs in terms of both their economic and emotional recovery from the flood. For economic recovery, five respondents said that aid received was not important, one said that it was somewhat important, and five said that it was very important. For emotional recovery, six mentioned that none of the aid programs were important, two said that they were somewhat important, and three said that they were very important. Therefore, in both cases, aid programs were helpful to only about half of the respondents.

Respondents were also asked to discuss their feelings about getting help from aid organizations. When asked about receiving aid from federal and state agencies, five respondents said that they felt all right about receiving such aid, but six felt that it was difficult to do so. Those who thought it was acceptable typically said that the aid was justified because they had contributed to the service by paying taxes. Those who had difficulty in accepting the aid usually referred to their upbringing and belief in an ethic of "pride and independence." Respondents found it even more difficult to accept aid from LDS than from the federal government. One thought it was acceptable, while the remainder had difficulty accepting LDS aid. As with taxes, contributions are routinely made to

LDS services through tithing. However, as church members, most respondents were used to giving and found it difficult to receive. Four respondents thought that it was reasonable to accept aid from local community and service organizations, while seven mentioned that they had difficulty in accepting such aid.

One large LDS family lost everything in the flood, and the male spouse lost his job shortly thereafter. In explaining her positive feelings about accepting aid, the female spouse of that family said:

People should be able to get aid. . . If they (LDS) can help you to rebuild and put you back where you were, then you're going to be a contributor. If you don't, you're going to be on welfare or something. . . They'd spend a lot more money on our family with seven children than they would to help us rebuild.

But most respondents accepted aid with reticence. Their church and families had taught them to "help themselves"; to ask others for help was difficult and embarrassing. One young man explained what it was like to apply for aid:

It was the hardest thing, because I love independence. I don't like to be dependent on anybody. . . I hated going to those meetings. It was offensive to me to fill out the papers. It was kind of like going on welfare or something like that. . . It was kind of embarrassing to sit down at the tables, and I hated it.

The female spouse of an elderly couple that had accepted clothing from a local merchant explained her feelings in shopping for the clothing: "We just looked like a poor, old, decrepit couple--you know--walking through that store. We were so downhearted, and we'd never taken anything from anybody, and to shop like that was horrible."

Informal Aid: Kin, Neighbors, and Friends

The primary group is frequently an important source of aid and emotional support in helping families to recover from disaster. It is particularly important in a Mormon community where the church teaches, "When in need, first look to yourself. If the need is beyond your scope, then look to your family. If the need is beyond their scope, then look to the Church."

The social context of primary group aid is different from that of formal aid. Typically it is offered without the recipient having to

request it. It is usually immediately forthcoming after a crises, in contrast to the lengthy waiting periods involved in acquiring formal aid. Additionally, one does not have to qualify for it, and no red tape is involved.

All respondents, except for one, had relatives in the Davis County/ Salt Lake City area, and those with relatives received a wide variety of assistance from them. The type of aid most frequently given was shelter; nine families stayed with relatives at some time after the flood. Emotional support from relatives was also important for those families who were interviewed, with eight receiving such support. Six families were given money by relatives; five received labor assistance; five received food, clothing, and household necessities; and three received help with child care.

All of the respondents received aid from friends and neighbors as well. The most frequently received aid was labor. At the onset of the flood, friends and neighbors worked together to protect their homes by sandbagging and removing possessions to safe locations. After the flooding subsided, they helped each other clean and repair homes and yards. All respondents received help with the cleanup work.

Emotional support from friends and neighbors was also important, with eight respondents receiving such support. In talking about her feelings, one woman said, "Oh yes, they just stand and cry with you, just as easily as they help you financially. They feel helpless, but it's just nice to know that people are concerned."

Six families received food, clothing, and household necessities from friends and neighbors; two received money; two received storage room for their salvaged possessions; and one received shelter.

One woman discussed the role of friends and neighbors in her family's recovery:

Friends, we always thought we had a lot of friends, but it turns out there's a lot more really close friends than we thought. They sent us home to bed at nights because we were just wrung out, and they stayed here all night long. And they ran themselves down. There was a lot of them that had bad backs, bad this, bad that, run down. . . but they stuck it out here.

When asked to discuss the importance of aid from kin, friends, and neighbors in their recovery, respondents rated such aid slightly more important than the formal aid programs in economic recovery. Four said that it was not important to their economic recovery, while the remainder said that it was important. As might be expected, respondents rated the support received from primary groups as much more important to emotional recovery than that received from formal organizations. Furthermore, it was readily apparent that the respondents were more comfortable accepting aid from primary group members than from formal organizations. Seven respondents thought it was proper to accept aid from relatives and friends, while the others found it difficult. One woman explained that she could not take money from her parents:

I've sneaked some money back in Dad's bill drawer. . . I really feel like I should repay in some way, but I also know that, myself, I don't want to have people hurry and repay me for acts that I've done. But I've never had the money to give, so money is my hardest thing.

Another woman felt that family and friends should help each other:

Like I say, I'd rather be on the giving end rather than the receiving end, but I mean that's what family and friends are for. If you can't help emotionally and with stuff when somebody needs you, to me that isn't a friend or a family.

Another felt that accepting help bonded people together:

It's a greater love because they have been able to share something with you, and therefore, the bond between you is greater. . . So you have to allow that. . . If you say, 'No, no, we won't take that,' then you've stopped something very sweet between you.

Economic and Emotional Recovery

At the time of interviewing, five months after the flood, repairs and rebuilding were not complete for any of the respondent families. For those who had to make repairs, most had begun the work with their own financial and labor resources. However, the completion of these repairs would require financial and labor assistance from SBA, IFG, and LDS. For those four families whose homes were totally destroyed, no planning or rebuilding had begun. Two had received commitments for aid from SBA and

LDS, but two were still not sure how they would finance rebuilding or if rebuilding would be possible. It appeared that because flood insurance coverage was lacking, repair and rebuilding would progress slowly in Davis County.

Respondents were asked to estimate the total amount of financial and labor aid committed to them by insurance and formal aid programs (additional aid commitments may have been received after the interview period). Three respondent families received no aid commitments, three received less than \$10,000, two received from \$10,000 to \$25,000, and three received over \$25,000. The average amount of aid received by the eleven respondent families was approximately \$17,000. Thus the percentage of losses covered by aid and insurance seems to have been generally low. Six respondents expected to recover less than one-fourth of their losses, four from 26% to 75%, and one 87%.

When asked to assess their families' recovery, no respondent felt that they had completely recovered, either economically or emotionally, from their losses. In assessing economic recovery, eight said that they were not at all recovered, while the remainder indicated only partial recovery. Emotional recovery progressed somewhat more rapidly. Only one respondent said that no progress had been made emotionally, and of the others, six said that they were somewhat recovered, and four said that they were mostly recovered.

Findings: Response of Aid Organizations in Utah

Because of the pervasiveness of the LDS Church and its ancillary organizations in Utah, it was expected that their presence would affect the response strategies of traditional disaster aid organizations. Federal, state, and private disaster relief organizations established operations in Utah with preplanned and tested procedures for dealing with disasters. In contrast, the LDS Church entered the emergency with established operations and procedures for dealing with families in need.

The following discussion covers the major organizations involved in the flood response--LDS Church, FEMA, Individual Family Grants, American Red Cross, Salt Lake Area Chamber of Commerce, Flood Recovery Committee, and Governor's Task Force on Flood Relief--and reviews major issues

resulting from the interactions between the LDS aid system and the other disaster-specific systems.

LDS and its Program

The presence of LDS affects the everyday lives of most families in the Salt Lake City area, whether they are members of the church or not. As already noted, LDS is well organized to respond to the social and financial problems of its members, and LDS disaster assistance followed those traditional lines of response. No new groups or committees were formed to deal specifically with disaster assistance.

Also as already noted, the church provided a variety of types of aid before, during, and after the floods. Although statistics were not available specifically for Davis County, LDS estimated the number of persons who provided labor and the number of man-hours expended in prevention and cleanup of the flooded areas in Utah during the emergency period from April 12 to June 4, 1983:

Individuals Donating Time or Equipment	97,125 persons
Donated Labor Hours	824,327 hours
Donated Equipment Hours	80,730 hours

Besides providing building materials and general work crews, LDS provided skilled workers, such as electricians and plumbers, to repair homes. Also, depending on the victim family's financial resources and losses sustained, LDS provided money and specific items, such as carpeting, furniture, household goods, and windows. In cases where the church offered to help in rebuilding homes with volunteer labor and materials, the rebuilding was typically a joint effort, with the victim families providing whatever financing and labor they could, and LDS providing the remainder. Repair and rebuilding assistance was offered to church members and nonmembers alike, and volunteer labor and equipment was likewise donated by both members and nonmembers.

Beyond the ward and stake level of the church, the highest level is the general authority which is headed by a full-time executive administrator who is a member of the LDS priesthood. However, as discussed, the response of the church began, as tradition and organization dictated, at the lowest level (the ward). The general authority did make procedural recommendations to the stakes and wards, but no orders or directions were

passed down. Each ward was expected to provide the necessary assistance to both members and nonmembers alike, and the stake was to assist if local financial and labor resources were depleted. Typically, a unaffected ward took on the complete responsibility for aiding one family in an affected ward. In no way could church response be considered uniform across wards. The quantity and type of assistance given to individual victim families was dependent on ward resources and bishop decisions.

The outpouring of volunteer labor may be attributed to the basic teaching of LDS which emphasizes the moral responsibility and obligation of individuals to aid those in need. LDS members are taught to respond to a call to service from their leaders, no matter how menial the task. Thus, this service is both a personal response and an organized church response; the organizational structure is in place to call one worker or a group of workers for a job, and personal responsibility ensures that those called will comply.

The church has two primary sources of income. Each family tithes (contributes 10% of its income) and additionally makes fast offerings--that is, once a month they abstain from food and drink for two meals and make a donation to the care of the poor and needy. The money used to assist victim families came from such fast offerings made at the ward and stake levels. Although funds were set aside at the general church level to aid victims, no ward or stake had requested general church assistance by the time of interviewing.

Because traditional lines of response were used to assist families, there was little need to publicize available LDS services. (However, some respondent families reported that they had read articles in newspapers stating that the church planned to help families recover.) The church used its organization of home teachers and visiting teachers to seek out needy families; each ward has male home teachers and female visiting teachers who have the responsibility of watching over each family in that ward. Periodically and as necessary, the teachers visit families in their homes. Among other responsibilities, during these visits teachers assess family problems and needs and then report back to the bishop. He in turn talks with the family head, and together they

decide what can be done about the family's needs and what the church's involvement will be.

Although outreach during the disaster was handled through this system, church officials believed that in many cases the system was altered; families went directly to the bishop, and members reported the needs of other members and nonmembers in the ward bypassing the home teachers. In addition, bishops were available at the DACs, although not in official capacity, to advise and support their members. In some of the affected wards, an LDS survey was made of damaged homes.

When asked to evaluate their response, LDS Social Service officials identified three problem areas. First, there was clearly a need to set up communication between church and public officials and to designate respective domains of responsibility before a disaster occurs in order to avoid confusion and conflict between these groups. Second, there was a need to establish an emergency communication system among key church and community leaders so that telephones could be bypassed in an emergency. Third, although some wards and stakes tried to form new committees to deal specifically with the emergency, officials believed that those wards following traditional lines of response were more successful; they wanted to impress on their wards the importance of following those traditional procedures in an emergency.

Overall, the LDS officials assessed their response as successful. Large numbers of volunteers were organized and used effectively, and many individual families received assistance in cleanup and recovery. The officials felt that church efforts had brought community members, both LDS and non-LDS, closer together.

Federal Aid

Of the 29 counties in Utah, 22 were declared disaster areas by a federal disaster declaration that extended from April 12 to June 30, 1983. Twenty-two counties were declared eligible for public assistance and 11 for individual assistance; Davis County was eligible for both. At this time, five Disaster Assistance Centers were set up--in Spanish Fork, Ogden, Farmington (Davis County), Salt Lake City, and Delta--and a telephone hotline was established to take applications for individual assistance. Ultimately, about 1200 applications for individual assistance were received.

As mentioned, services provided by the federal government to individual families were small business loans (SBA), temporary housing, amended tax returns, and farm home loans. By mid-July (two weeks prior to the application deadline), approximately 400 applications for SBA loans had been taken and 11 accepted. At the same time, FEMA had taken in 458 applications for temporary housing assistance, and 258 had been accepted.

There was extensive media coverage publicizing the particulars of federal assistance. Announcements were made in all newspapers and on all television and radio stations through May, June, and July. Flyers were distributed prior to the opening of the DACs, and public meetings were held explaining the kinds of assistance available to victims.

FEMA estimated that 5,000 families were affected in some way by the flood. Yet despite the extensive publicity, only one-quarter of these families applied for assistance. Federal and state representatives believed that the poor response was due in part to LDS emphasis on family self-sufficiency.

In addition to providing aid to families, FEMA compiled computer lists of all applications and verifications and made the lists available to other helping organizations, such as the Red Cross and the Governor's Task Force. This cooperation eliminated victims having to make separate application to different organizations and, likewise, those organizations having to make separate verifications.

Individual Family Grants (IFG)

The Individual Family Grant Program was administered by the State of Utah through its Department of Social Services. As already noted, IFG is an aid program of last resort. Depending on losses, needs, resources, and other aid, families were eligible for grants up to \$5,000.00 that could be used for a variety of purposes--repairs, rebuilding, necessities, extra travel expenses to and from work, funeral expenses. At the time of the interviews, 684 applications had been submitted for grants statewide; 189 had been approved, 59 withdrawn, 207 denied, and the remainder pending.

When the federal government conducted an assessment of the damage due to the first flood in April 1983, a technical assistant also arrived to train the designated grant program coordinator. That person and her staff were already employed by Utah's Department of Social Services, and

no new people were hired to administer the program. The coordinator had the authority to utilize people from any of the Social Services district offices. These personnel were experienced in taking applications and verifying information for eligibility. The total staff numbered about 30.

Training was done quickly, under the pressure of time. After the coordinator was trained, she trained additional staff and they in turn trained others as new disasters developed. Typically, those taking aid applications were trained the day prior to the opening of each DAC. Verifiers spent one day in the field with a trained verifier and the next day began working alone.

Although the day-to-day operations of the program were overseen by the coordinator, a state administrative panel, consisting of the coordinator and supervisory level personnel from the state offices and divisions, made decisions on grant awards and their dollar amounts. The State of Utah funded 25% of the program and the federal government covered 75%. A total of \$400,000 was committed to the program, and \$167,000 was expended at the time of interviewing. Because IFG participated in the DACs and the hotline, outreach was similar to that of the federal programs previously discussed; it utilized the media and public meetings to advertise its services.

In an interview, the coordinator of IFG discussed her feelings about the strengths and weaknesses of the program. With the probability of floods the following spring (1984), she felt there was a clear need for advanced and more detailed training for prospective staff members. Also, new staff members needed to be hired to alleviate work pressure created by existing social services assistance programs. In order to improve cooperation and coordination with FEMA, the coordinator felt that the administrative offices of the IFG program should be located with the federal disaster office. For the 1983 floods, the programs were located in two different cities. Along with lesser changes in administration, the coordinator felt strongly that the management structure of the program had to be changed. During the 1983 disasters, the Department of Social Services administered the program, while the state's Emergency Management Services managed the program. The coordinator felt that the separation between administration and management was cumbersome and

ineffective. She wanted the Department of Social Services to have complete control of the program with the possibility of a liaison arrangement with Emergency Management Services. In light of the Department of Social Services inexperience in administering the IFG program, the coordinator felt that it moved quickly and efficiently. She also felt that cooperation within the department and with federal personnel was successful.

American Red Cross

The American Red Cross is specifically organized to respond to emergencies. At the time of flooding, the Red Cross in Salt Lake was being reorganized from a divisional to a key resource structure, thereby putting the entire state under the jurisdiction of the Salt Lake Area Chapter.

The Red Cross provided two categories of aid to victims in Utah--emergency and additional assistance. Emergency assistance consisted of providing mass feedings to victims and workers, sheltering victims, and providing emergency care to victims.

The Red Cross served 55,000 emergency meals to victims and work crews--a large number to sandbagging volunteers who were redirecting flood paths to city streets in the Salt Lake City area. Food was also provided in emergency shelters set up to house evacuees.

These shelters were established around the the state as needed. In Davis County several shelters were opened, closed, and reopened as flood waters and mud slides threatened various parts of the county. Approximately 1,700 persons utilized the shelters in Utah, with about 700 staying for at least one night. Typically, LDS bishops met their affected ward members at the shelters and arranged to place them in the homes of other members.

In Davis and Salt Lake Counties, emergency assistance to individual families (including food, shelter, clothing, bedding, household supplies, furniture, nursing care, minor home repair, and small appliance repair) did not begin until about one week after the flood. Approximately 537 families throughout the state received such assistance.

The second major category of assistance provided by the Red Cross was "additional assistance"--aid in rebuilding or making major repairs to destroyed or damaged homes. At the time of interviewing, the Red Cross

had entered its additional assistance phase but had helped only two families with this kind of aid. The Red Cross was in the process of working with LDS to come up with a rebuilding plan for destroyed homes. Red Cross officials said that they expected to pay for building materials and LDS to provide the labor to reconstruct homes, and that there was the additional possibility that LDS would provide both labor and materials for their affected members. However, no final plan had been developed.

The Salt Lake Area Chapter responded to the floods with minimal assistance from national Red Cross staff. Initially, three national staff personnel worked to set up the assistance centers and to develop public relations programs. Twelve local staff members (approximately half paid and half volunteer) worked on the flood relief effort. The staff was supported by 550 additional persons with little or no previous Red Cross experience who volunteered for the flood effort. There was inadequate time to train these volunteers, and those who did receive training were generally used in supervisory positions.

There were no guidelines for the interorganizational relationship between the Red Cross and LDS. Apparently the relationship differed from flood site to flood site, and it was most often the Red Cross that had to change its procedures accordingly. In some areas, LDS provided most of the emergency assistance with the Red Cross supporting their efforts. In Davis County, Red Cross officials seemed more satisfied than in some other areas with their relationship with LDS. In contrast, the Red Cross and FEMA have a long record of mutual cooperation in disasters, and according to officials, that tradition was maintained in Utah.

The Red Cross is funded by donations, and thousands of dollars of donations were received, both at the local and national levels, specifically for the Utah flood effort. By September 1983, the Red Cross had expended approximately \$160,000 on mass care and family service in Utah.

The Red Cross was present at all of the DACs, providing information and service to victims. Similarly, they were represented on the Governor's Task Force in reviewing individual assistance cases. Their services were publicized in the newspapers and on television and radio during and after the flooding.

Victims had to initiate contact with the Red Cross to receive assistance. Their residence was then verified using the Red Cross's damage

assessment, a caseworker was sent to evaluate needs, and the disbursal of aid was made based on that evaluation. In addition, FEMA's computer list of victims was used to assist in the verification and evaluation of victim needs. For the most part, the Red Cross saw the same victims as FEMA; Red Cross officials estimated that 95% of the victims they helped came through the DACs or sought help from FEMA.

Red Cross as well as FEMA and IFG officials were disappointed with the small number of victims that sought their help. One Red Cross official said, "I think we could have met other needs, but they didn't choose to come and seek assistance from us. We can't go and bat them over the head and tell them we want to give you something, so we didn't."

The small victim response was attributed to the "independent nature" of the people, their reluctance to ask for help, and the LDS promise to return members' homes to their pre-flood condition.

In discussing their agency's weaknesses and strengths, Red Cross officials expressed the need for a pool of trained volunteers to draw upon in an emergency. In Utah, they worked with local churches and local service groups to find and organize volunteers, and they were constrained by inexperience and pressing time. In the future they intend to seek a clarification of emergency roles and procedures relative to the county, city, and LDS church.

The Red Cross's greatest strengths were its ability to provide immediate emergency service and its ability to amass money and volunteers to support those services. They felt that the cooperation within their chapter and with other helping agencies, as well as their ability to do an effective job without significant support and direction from national Red Cross personnel indicated the soundness of their organization.

Salt Lake Area Chamber of Commerce Flood Recovery Committee

The Flood Recovery Committee of the Chamber of Commerce was representative of the many organizations in the Salt Lake area that emerged to give aid to disaster victims. Although the Chamber of Commerce is an organization of business people, no Flood Recovery Committee funds were used to aid businesses, all money going instead to aid family recovery.

Having no initial formal guidelines, the Chamber was flexible in the types of services it was able to provide. It primarily became involved in replacing furnaces, landscaping, and clothing. Central to its effort

was its attempt to ensure that needy families who might have otherwise "fallen through the cracks" of the traditional disaster aid system received help. Thus Chamber officials directed their efforts toward families who could not qualify for aid from other organizations or who needed things that the other agencies could not provide.

Services were not limited to Salt Lake City residents but were offered to victims all over Utah. At the time of interviewing, only a few families had received aid from the Chamber. Officials felt that they would deal with more cases once rebuilding was further along and public decisions were made on the disposal of damaged properties.

Chamber officials felt that they were "invited" into the role of providing recovery aid to flood victims by business people and individual citizens. Initially, they received donations both from local and national businesses and individuals, usually with the stipulation that the Chamber distribute the funds directly, independent of government and traditional disaster organizations.

In June 1983, the Chamber decided to organize a formal committee on flood recovery. Shortly thereafter, the Chamber employed a part-time volunteer coordinator, whose job was to contact victim families, bring their needs to the Chambers' committee, and to provide funds and services to those accepted for aid.

Initial funding for the committee came from a large donation by a local bank and various small donations at both the local and national levels. Subsequently, the committee mounted a large media campaign to solicit additional donations for its fund. It also received many donations in the form of goods and services. Interestingly, because the Chamber is an organization of businesses, it could request from members specific types of materials or labor that its flood clients needed. For example, if a client needed a yard landscaped, the Chamber called on one of its member landscape architects to donate his services.

Along with its media campaign to solicit donations, the Chamber advertised its services and requested victims to contact them. It also received the names of victims in several other ways. In some instances, friends and neighbors of victims gave the names of victims to the Chamber. Additionally, the Chamber was a member of the Governor's Task Force on Flood Relief, which also referred names of victims to the vari-

ous helping agencies. The Chamber, as well as the Task Force, verified the needs of the prospective clients through FEMA's computer list of victims.

As with the other helping organizations, the Chamber was disappointed in the number of victims seeking their aid. Obviously, the Chamber had a great deal of resources at its disposal, but apparently few victims were willing to ask for its help. The Chamber attributed this lack of interest to the "pioneer spirit" of the people in the area and their reluctance to ask for help--especially from the federal government. Thus, because victims were asked to apply first to FEMA and to get on their computer list before applying for aid from other organizations, such as the Chamber, the number of persons requesting aid was greatly decreased. The coordinator felt that it would be advantageous for the Chamber to compile its own list of victims in order to bypass FEMA, that there were victims who would use the Chamber's help, if it were not for this obstacle.

The Chamber indicated that it wanted to do more preparation and planning in advance of another emergency in order to better assume a helping role in organizing the community and responding to victim needs. At the time of interviewing, it was corresponding with other Chambers across the country concerning emergency preparedness. Therefore, it appears that the Salt Lake Chamber wanted to make disaster relief a permanent function.

Governor's Task Force on Flood Relief

With both traditional and emergent organizations as well as LDS providing aid to flood victims, there was a need to coordinate relief efforts--both to ensure that all victims received help and to avoid duplication of aid. The Salt Lake Area Chamber of Commerce first began organizing the various groups in the beginning of June 1983. Within a few days of the announcement of the Chamber's effort, the Governor of Utah announced that his office would coordinate the various helping organizations. The Chamber of Commerce gave up their effort and became a member of the Governor's Task Force.

Although the Governor's office's primary function was to coordinate the work of the other aid organizations--FEMA, IFG, American Red Cross, Thistle Relief Fund, Salt Lake Area Chamber of Commerce, Salvation Army,

area churches, and LDS (which participated in an advisory capacity)--and to ensure again that victims who might otherwise have been ineligible for aid from the traditional aid organizations received help. The Task Force met periodically to review cases and figure out which organization could best help in a given case. In reviewing cases, the organizations also had the opportunity to "compare notes" and avoid duplication of services.

The Governor's office did receive approximately \$8,000 in unsolicited donations for victims, but at the time of interviewing, none had been allocated. All cases under review had been passed to the other member organizations. The Governor's representative on the Task Force suggested that donations to the Governor's office would be held until the following year in the event of further flooding. The actual administrative and coordinating activities of the Task Force were funded by the Governor's office and not by donations.

The Task Force did not publicize its services. In most cases, victims or their acquaintances contacted the Task Force, and in a few instances FEMA referred cases that did not qualify for its services. However, before the Task Force would review a case, the victim had to first apply to FEMA and be placed on its victim list.

Again, as with the other helping agencies, the Task Force was disappointed in the number of victims requesting its help, and again the small numbers were attributed to LDS emphasis on self reliance.

In discussing potential improvements, the Task Force coordinator stressed the importance of improving communication and cooperation among disaster organizations and emergency personnel and clarifying procedures and domains of authority. She also stressed the need to improve public relations so that people in the community would know who to contact to meet particular needs. The coordinator felt that a basic strength of the Governor's Office and Task Force was its ability to work with federal disaster personnel to provide emergency assistance to victim families.

Issues in the Response of Aid Organizations

During the interviews with the major aid organizations, a number of issues emerged--several particularly dealing with the interaction between LDS and the other relief organizations. Specific issues centered around the initiation of the aid process, emergent disaster relief organiza-

tions, domains of authority, community response, and emergency and longer term recovery response.

Initiation of Aid

In order to receive aid from disaster relief organizations, victims had to apply for it--they had to "ask for help." All of the officials interviewed noted that affected residents were reluctant to make such a plea. Some attributed this to the general character or "pioneer spirit" of the people, others to the LDS tenet of self-reliance. These same officials expressed disappointment in the small number of victims applying for their services, believing that there were many people who needed help but were not asking for it. FEMA estimated that they received applications from only one-quarter of the victims in Davis County. FEMA serviced those who applied for its aid and closed its field operation by September. Other disaster relief organizations, particularly the new, emergent ones, continued to solicit donations and to seek out victims, even though they recognized that there were few willing recipients. In addition, although they recognized victim reluctance to apply for aid (particularly from the federal government), each of the disaster relief organizations still required potential clients to begin the aid process by applying to FEMA so that those victims would be on FEMA's computer list. (Since most of the disaster relief organizations, except for the American Red Cross, did not have their own verifiers, they took advantage of FEMA's system.) Thus, this procedure probably discouraged some persons from applying to other sources of aid. However, only one official, the Salt Lake Area Chamber of Commerce coordinator, mentioned a need for establishing a list outside of FEMA.

Despite their reluctance, many victims did apply to FEMA for aid. Still, some felt initial guilt and humiliation, while others were easily rebuffed by personal questions and impersonal bureaucratic procedures. Some members of the Chamber of Commerce and the Governor's Task Force mistakenly believed that their groups saved victims the "humiliation" of waiting in DAC lines. In fact, victims had to queue up at the centers before applying to either group.

Many of the officials of the disaster relief organizations assumed that LDS would take care of the victims not reached by disaster organizations. This assumption was not supported in actual practice for several

reasons. Although the LDS outreach system of home teachers and visiting teachers was effective with victims reluctant to request official help, it seems to have been ineffective in reaching nonmembers and inactive members who were not integrated into the pre-existing system. Ostensibly, emergency protection and cleanup crews were provided by the church without having to be specifically requested, but more expensive and time consuming repair and rebuilding work had to be requested from ward bishops by victims. Thus, the LDS outreach system did not completely mitigate the problem of victim reluctance to request aid. Moreover, as the interview data show, respondents were less willing to request aid from the church than from the government. Since LDS aid was not uniformly provided, victim visibility, initiative, and personal beliefs were apparently important in determining aid from the church. Official aid programs, of course, did not rely on such individual traits in providing aid.

Despite the extensive publicity and outreach efforts of all the organizations, each official interviewed, including those representing LDS, believed that there were victims "out there" who had not been reached. The interview data indicated that respondents expected that only small amounts of their losses could be recovered through aid from organizations including LDS. Thus, it appears that overcoming victim reluctance to solicit aid may be critically necessary in disaster areas where victims are not culturally predisposed to do so.

Emergent Disaster Relief Organizations

In Utah, many new disaster relief organizations (or new committees within established organizations) emerged following the floods. The ones most often mentioned during interviewing were the Thistle Relief Fund, the Salt Lake Area Chamber of Commerce Flood Recovery Committee, the Governor's Task Force on Flood Relief, the Salt Lake City Bank Association, and the Bountiful Chamber of Commerce. Apparently, other service organizations and churches also initiated their own projects. Most of these organizations formed after receiving unsolicited donations given with the stipulation that the aid go directly to victims and not to official disaster relief organizations. It was not clear to the organization officials interviewed why such stipulations were attached to donations. Apparently, because no central organization was established

specifically to accept donations for the flood victims of Utah, potential contributors feared their donations would be mixed with resources to be used for other philanthropic interests. Hence, the new organizations accepted the donations and set up operations for dispensing that aid. Most of these organizations publicly solicited additional donations, but their funds were minimal compared to those of the larger relief organizations and LDS. Typically, these emergent groups were staffed by volunteers and did not have enough funding or expertise to employ caseworkers to verify needs. Thus, they also relied on FEMA for these services and could not provide aid to victims who had not applied for federal aid.

The emergent organizations all shared the goal of trying to insure that victims in need did not "fall through the cracks" of the traditional aid system. They also sought to provide services that would not be offered by others. These goals, along with a concern for avoiding duplication of aid, underlay the effort to coordinate the activities of the new organizations with those of the traditional ones. As noted, that effort resulted in the formation of the Governor's Task Force on Flood Relief--a group that itself aided few victims directly (the Department of Social Services representative on the Task Force complained that she had to sit through the review of a few individual cases by the Task Force, while she had hundreds of cases to be reviewed on her own desk).

The Task Force did not seem to be very successful in meeting its goal of providing aid to "hard luck" cases. Its dependence on FEMA for verification of need, made it almost impossible to reach victims who were not being cared for by the formal aid programs. In addition, the Task Force's attempt at eliminating duplication of aid to individual victims was somewhat thwarted by LDS. Although LDS sat on the Task Force in an advisory capacity, its representatives refused to give specific information about the aid they extended to victims, and it was therefore impossible for the Task Force to know if aid had been duplicated. Thus it appears that the coordinating activities of the Task Force could have been more successful if 1) there had been a central receiving site for donations, 2) the coordinating group had had its own verification system, and 3) the LDS church had cooperated more fully.

Each of the emergent organization officials interviewed expressed the desire to perpetuate their own disaster relief activities. In

September, individual organizations were making plans to improve operations and to hold over funds for the next disaster. However, little attention was being paid to improving interorganizational cooperation.

Domains of Authority

On the face of it, LDS cooperated with federal and local governments. LDS administration advised stakes and wards that local governments were in charge of emergency operations, and the church made every public effort to cooperate with emergency and relief personnel. However, LDS is historically a very independent organization, and this ethos brought about complications and rivalries concerning domains of authority.

Each of the disaster relief organization officials interviewed, while grateful for the many contributions of LDS during the disaster effort, mentioned the need for better cooperation and coordination with the church. The Governor's Task Force and the IFG officials felt that their services were hindered by the unwillingness of LDS to share information on specific individuals. The Red Cross mentioned conflicts with LDS over leadership in every flooded area. In some areas LDS took charge of emergency services and the Red Cross supported their efforts; in other areas, these roles were reversed. But in all areas, LDS appears to have decided how leadership and support would be organized, and the Red Cross followed. This occasionally made relationships between the two organizations difficult. By September, the Red Cross was still unsure of what its role would be in the major repair and rebuilding of homes, because LDS had not finalized its own plans. It is not surprising that the Red Cross saw a need to coordinate emergency and long-term recovery activities with LDS prior to the occurrence of another disaster in Utah.

During the emergency in Bountiful, Davis County Emergency Management Services and LDS officials also had conflicts over manpower, emergency facilities, and emergency operations. Respondents in Bountiful complained that Civil Defense (Emergency Management Services) neither warned them nor directed evacuation. According to the officials interviewed, this inadequate response probably resulted from confusion over spheres of authority.

The LDS Church certainly aided emergency and relief organizations in Utah by providing emergency manpower and aid to victims. However, by

maintaining its separate, independent operations, it was also disruptive during certain phases of the emergency and during the period of aid and recovery. Therefore, it appears that an emergency preparedness plan is needed in Utah which includes not only lines of authority among the various governments, agencies, and organizations involved in disaster response, but also takes into account the involvement and cooperation of the LDS Church. It is not at all clear that such a plan is possible-- particularly because the church's response begins at the lowest levels (the wards) where decisions and actions can vary widely.

Community Response

A significant benefit that LDS brought to the disaster situation was a sense of community. People indicated that they cared about each other and worked together, whether by ward or neighborhood, to save their own and each other's property. Local work groups were formed to perform the heavy labor of first sandbagging and then cleaning mud and water from homes; and after cleanup, neighbors and ward members were available to help with emotional problems. Victims reported that there were always people present who would discuss problems or check to see how they were doing. Several women gave parties for victims to which guests brought gifts, such as towels, sheets, blankets, and other household necessities. Local merchants offered gifts, discounts, and wholesale prices to victims. Many disaster relief organizations noted that they had more volunteers and donations than willing recipients.

Despite personal tragedies, victims were expected to maintain their LDS obligations. Some of the victims interviewed felt that maintaining these obligations gave a sense of continuity in their lives, even though other aspects had been disrupted. Participating in the church also allowed them to maintain social contacts and thus provided diversion from the work brought on by the disaster.

As mentioned, this sense of community was fostered by the ideology of the LDS Church. Members are taught to help others; when a ward bishop requests help, members are expected to respond, regardless of the task, and a portion of members' tithings go to an elaborate welfare system that provides aid to needy members. Moreover, those members are encouraged to become involved in neighborhood and community projects. Although people everywhere may "pull together" in an emergency, the sense of community

displayed in Utah was definitely an outgrowth of the local culture; church organization was essential in developing the sense of community which facilitated a strong collective response to the emergency. In a sense it may be said that a therapeutic community (Barton, 1970) was in place prior to the actual emergency.

Emergency Versus Longer-term Response

From the interviews with both victims and officials, the immediate emergency response seems to have been more successful than the longer-term recovery involving major repairs and rebuilding. As indicated above, respondents said they expected to recover only small percentages of their losses through the available aid programs.

At the time of the interviews, this perception seemed to be correct. Although immediate emergency response by federal, state, and local groups had been effective, most victims did not have flood insurance, and federal loans and state grants covered only small percentages of losses for victims who were eligible. The limited resources of smaller disaster relief organizations did not permit them to enter into major repairs and rebuilding activities. And, although the Red Cross did enter into an Additional Assistance Phase, its efforts appeared to be deadlocked in negotiations with LDS over the rebuilding process.

As discussed, the LDS Church was also certainly an asset during the emergency period. It was able to recruit and organize large numbers of volunteers to sandbag streets and private homes. Through its network of church members, it provided emergency and longer-term temporary housing. Teams of church members removed mud and water; scrubbed walls, floors, furniture, and rugs; cleaned lawns; and performed a myriad other jobs that would have been overwhelming for an individual family. But in comparison to these LDS successes during the emergency period, in later months help with major repairs and rebuilding was much slower in coming. All of the families interviewed whose homes had been totally destroyed were relying on LDS to supply materials and perform a major portion of the work. However, at the time of this study several months after the disaster, no plans had been developed for the work. Rebuilding handled by the church was expected to involve volunteer laborers, contractors, plumbers, electricians, and other workers, and would most likely be done on a part-time basis. Given that volunteer interest would no doubt fall

off in the months after the disaster, it appeared that rebuilding would be a slow and frustrating process. Unfortunately, this study did not encompass that period of rebuilding. It was clear, however, that long-term recovery was not proceeding as well as the initial emergency response, and, moreover, that the reluctance of victims to seek aid from formal sources resulted in significant delays and indecision regarding rebuilding despite the sheer amount of aid available.

CHAPTER V

KAUAI, HAWAII AFTER HURRICANE IWA

This chapter and the next report on two disasters that struck several months after the Paris, Texas, tornado. Both the sites examined (Kauai, Hawaii and Coalinga, California) were surveyed by the same researcher, so there is an opportunity to review them comparatively. Some of differences and similarities will be pointed out in the discussions of each disaster, and, in addition, the quantitative data for the two studies are presented side by side to facilitate further comparison.

Between October of 1982 and April of 1983, the authors monitored all United States disasters for the purpose of selecting sites in which to study further the use of disaster assistance. Eventually it was decided to use communities affected by Hurricane Iwa, which had hit the Hawaiian Islands in November, 1982. The researchers had some reservations about the site, based on perceived logistical problems and the complexity of the ethnic make-up of the communities. Both features turned out to be manageable, and the site has offered several interesting features to the overall study.

The disaster had major consequences for the built environment and the daily economic and social activities of the affected area. The event and the official response to it are described here only briefly. This chapter is mainly about findings from our survey of the disaster victims several months after the event. Detailed reports on the physical effects and governmental response activities are available elsewhere.

The Disaster and the Community

Tropical Storm Iwa was identified on November 18, 1982, at 2:00 a.m. and upgraded to hurricane status at 5:00 p.m. on November 22, 1982, as it moved northward 500 miles southwest of Honolulu. A hurricane watch was issued at 11:00 a.m. on the 22nd; Iwa was considered to be of moderate intensity. Hurricane warnings (generally announced when sustained winds are expected to reach about 75 mph in 24 hours' time) were posted at 8:00 a.m. on the 23rd.

Most of the severe damage caused by heavy wave action happened in the 24 hours following the warning. The islands of Oahu, Kauai, and

Niihau were battered by swell waves throughout the day of the 23rd. At its closest, the eye of the hurricane was 30 miles to the northwest of Kauai. Winds gusted to 85 mph, and sustained winds of 65 mph were recorded. Winds of approximately 65-70 mph were felt in coastline areas and diminished to about 50 mph 1.5 miles inland. Very little rain (less than three inches) preceded or accompanied the storm.

While portions of Oahu sustained damage, the Islands of Kauai and Niihau were the most severely damaged. Kauai lies 95 miles northwest of Oahu at the northwestern edge of the major island chain. The island is 32 miles in diameter and has a population of approximately 40,000. Although under the political jurisdiction of Kauai County, the small island of Niihau (population 260) is privately owned and not accessible to the public. To increase manageability of the field efforts, only the island of Kauai, which is totally subsumed by the County of Kauai, was selected as the study area. Oahu, and thus Honolulu, was excluded from consideration.

Impacts of Hurricane Iwa

Prior to Hurricane Iwa, only one other hurricane had passed through the Hawaiian Islands in modern times. Only August 6, 1959, Hurricane Dot came into direct contact with the islands, causing an estimated \$5.7 million in damage, mostly on Kauai. At most, two additional hurricanes are known to have approached the islands in the past 150 years. Direct impacts have been relatively rare, with most tropical storms turning west before reaching the islands.

Flooding, rather than high winds, has posed a more frequent threat on Kauai. Caused by tsunamis and intense rains, and an occasional high surf, most flooding has been in poorly drained, low-lying areas and along the shorelines. The March, 1957 tsunami produced damages totaling \$1.5 million on Kauai. Hurricane Iwa was the most costly disaster to hit the island in recorded history. Most of the damage was caused by swell waves and, to a lesser extent, violent winds. Wind damage was sporadic and was island-wide. The most extensive wave-related damage occurred along a 20-mile stretch on the southwest shore, including 1,170 acres between the communities of Kekaha and Poipu Beach.

Extensive property damage along the southwest shoreline extended up to 600 feet inland. The acceleration of the storm as it moved through

the islands and the action of high winds and waves over shallow reefs were responsible for creating coastal flooding.* Impacts were especially severe where land protruded into the sea, since wave action converged at these points. Property damage was notably higher in these areas due to their proximity to the ocean and the appeal to individual builders and developers.

Residential damage varied widely.** It ranged from the total destruction of beachfront homes and apartments, to minor losses from water damage to household furnishings and wind damage to roofs and windows. Much of the wind-induced damage was caused by flying debris and the inadequate attachment of roof materials. Where wind produced more substantial destruction, rainfall damaged the interior of homes. Major damage from high winds was primarily limited to older wood frame residences with corrugated metal roofs and to buildings without foundations. There was substantial flooding up to 150 yards inland.*** In many cases, it was difficult to distinguish between the effects of wind and the effects of wave action along the shoreline.

Damage reports varied from report to report, and across time as estimates were revised. (See Appendix B, Table 1 for estimate of damage. These figures, drawn from a variety of sources, may have changed since they were initially compiled from documents available. However, they give an indication of the magnitude of losses and damage related to the hurricane.)

Disaster Assistance

On Kauai, the State Civil Defense had responsibility for coordinating evacuation, immediate assistance and the services of the Red

*The debris line mapped by the Kauai County Planning Department exceeded the 100-year floodline and the 100-year wave level by 300 yards. Due to the infrequency of hurricane events in the area, flood-lines established by FEMA are based on tsunami studies and do not take into account the effects of storm surge associated with hurricanes.

**Residences are commonly of wood frame construction, set on a concrete foundation, and have roofs of metal sheeting.

***Many sections of beach road and shoreline residences were transported off their foundations and carried inland up to 100 yards, causing further damage to inland homes.

Cross, the Salvation Army, and the Armed Services (including National Guard and Coast Guard). The Presidential Declaration of the event as a major disaster was made on November 25th, thereby mobilizing federal resources to assist the state. Official Disaster Assistance Centers (DACs)**** were established in three locations--Lihue, Kaloa, and Kilauea--on December 2, 1982.

In the three days following, 1,622 persons registered at the DACs. The Kaloa center processed the greatest number of applications and had the most return applicants. This was due either to the more severe damage in that district, or to the socioeconomic characteristics of the inhabitants. Although the DACs closed on December 16, 1982, offices representing some of the assistance agencies (e.g., Salvation Army, FEMA) opened in Waimea and Lihue and were still open at the time of our interviewing eight months after the disaster.

The Community

When Kauai is described as a "community", the entire island is included. Persons live in a variety of settings, from fairly densely developed resort and village centers, to somewhat more isolated sets of dwellings clumped around agricultural or scenic areas, to scattered individual dwellings. However, the inhabitants of Kauai, and in particular those in the southeast sector of the island, can be considered as a community with respect to the impact of Hurricane Iwa and the response to it. When not on Kauai, these residents seem more typically to represent themselves as "from Kauai," and not from the particular sub-jurisdiction in which they might live within the County and Island of Kauai.

Kauai is typically reached by airplane, so the setting must be considered somewhat inaccessible, particularly to persons of lower socioeconomic levels. Portions of the western half of the island are virtually uninhabited due to the ruggedness of the terrain. The east and south coasts have resort developments scattered along them near the ocean, and a variety of agricultural pursuits are located inland. Sugar cane has been a main industry there for many years. Lihue, the country seat, is

****Established by FEMA, DACs are typically opened within a week of a federally declared disaster. Representatives of disaster assistance agencies are present to provide information on available aid, eligibility requirements, and the application process.

the major commercial district and contains the various state and local government offices.

A few general population characteristics (taken for the most part from 1980 census figures) are presented here to provide an idea of the general demographic character of the community. These figures represent, of course, conditions prior to the disaster. Two-thirds of the island's population inhabits the three southern districts of Waimea (8,593), Koloa (8,734), and Lihue (8,590). Predominant ethnic groups include Japanese (25%), Filipino (26%), Caucasian (29%), and Hawaiian (15%). Although most residents can speak English, about 29% of all residents five years of age and older speak a language other than English at home. Japanese-origin residents tend to be considerably older than the other residents (median age, 43), while Hawaiian residents are substantially younger (median age, 21). Hawaiian and Filipino families are likely to have a greater number of persons per family (4.29 and 4.30) than the average (3.62).

The median age of Kauai residents is 29.8 years. About 32% are under the age of 25 and 11% are at least 65 years of age. Of all families 84% consist of married couples, and 45% consist of married couples with children under 18 years of age. Over 1/4 of all residents 15 years of age and older are single. The median income of households (\$19,066) and families (\$20,882) was slightly less than that of the state as a whole (\$20,473 and \$22,751, respectively). About 9% were living below the poverty line compared to about 10% for the entire state. A relatively small portion (3%) was unemployed. Major employers include retail and wholesale trade (22%), public administration/government (16%), agriculture (10%), and construction (7%). About 64% of all Kauai residents 25 years or older are high school graduates compared to 74% for the state.

There are proportionately more year-round single family housing units on Kauai than in the state overall (81% vs. 60%). Over one-half of all year round units are owner occupied. The vacancy rate (21%) for rentals was over double that of the rest of the state (10%). The state as a whole has over four times the number of structures with five or more units than does Kauai (which has under 9%). At the time of the census

interview, about 22% of the residents had lived at their current dwelling less than a year.

The Study Method

For the most part, the study was similar to the Paris, Texas, survey described in Chapter III. The interviewing arrangements and sampling will be discussed here briefly.

Interviewing

The interview schedule contained 175 items and took an average of an hour to complete, with the interviewer reading the items and recording the responses. Most of the items were of a closed-response choice format, including Likert-type items. It was designed with two specific purposes in mind: the continued refinement of a model of family recovery, and a detailed analysis of formal and informal sources of assistance following a disaster.

A full-time field director stayed in the community throughout the survey. This permitted daily monitoring of progress and the replacement of interviewers when necessary. Interviewers were recruited and trained on site by this person. Although there are trade-offs for using local interviewers (respondents may be reticent to provide certain types of information) in the types of communities studied, the project benefited in ways beyond the economy of this arrangement. Local interviewers, many of whom had first-hand experiences of the disaster, or had served as postdisaster volunteers, had a great deal of information to share about the events surrounding the disaster. This information was especially useful in locating respondents who had been displaced by the disaster.

Locals also seemed to be better accepted by older, long-time residents. For example, on Kauai, many islanders have typically maintained some distance from mainland culture and institutions. This has been due, in part, to a distrust of outsiders and partly to an upsurge in attempts to increase self-sufficiency and cultural pride. A small proportion of residents were non-English speaking, and a number spoke English as a second language. The interviewer was instructed to conduct the interview in the language preferred by the respondent. The language barrier was not considered great enough on Kauai to translate the interview schedule into any of the other languages used.

The need for some degree of bilingual capability in order to assure understanding of various items in the schedule was most evident with the more recent Filipino immigrants and elderly Japanese. Seven of the 17 Kauai interviewers were bilingual; three Japanese, two part-Hawaiian, and two Filipino. They were permitted to do what translating was necessary. This was not considered to be of great concern for the bulk of the items, which were purely descriptive in nature ("What percent. . . ? How often. . . ? How many. . . ?"). Admittedly, reliability of the Likert-type attitude items was compromised to some extent by this somewhat ad hoc translating arrangement, but the method was necessary; the costs of three or four different language translations for relatively small numbers of respondents would have been prohibitive.

Sampling

Of the five districts on Kauai, the three southernmost districts--Kaloa, Lihue, and Waimea--were included in the survey. The site was restricted to these adjacent districts primarily to cut transportation costs and to reduce administrative efforts. The districts chosen are representative of the island as a whole and include an urban area (county seat) as well as a tourist community and several more rural outlying communities, both inland and coastal. Thus the sample is most appropriately characterized as representative of victims in three districts of Kauai.

Samples were drawn from each of the three districts separately and were proportionate to the number of damaged units within each district. A larger sample was drawn than in Coalinga, due to the complexity of the ethnic group characteristics, although budget constraints also limited the size. Beginning at random, every seventh listing was drawn from those houses showing some level of damage on the Red Cross damage assessment list. A 14% sample, or 521 residences, was selected from the 3,722 victim households.

A minor deviation from this procedure was used for assuring inclusion in the sample of residents from the community of Poipu Beach in the Kaloa district. This area was the most heavily damaged, and many of the residents were still dislocated from their pre-hurricane addresses. The majority of units in the Poipu Beach area are condominiums. Except for those units that were obviously hotel rooms or apartments, usually no

distinction was made in the Red Cross damage assessments between year-round condominium residents and those staying in time-share condominiums or other tourist facilities. Due to the difficulty of locating respondents who had been present at the time of the hurricane, interviewers were instructed to conduct interviews with victims on each street proportionate to the number of units damaged. Because of the extreme level of destruction in this area, many of these households had moved to another residence, often in another community further inland. The efforts of interviewers familiar with the residents were valuable in tracing displaced respondents.

Several criteria governed the substitution of households in cases where the potential respondent was unavailable or refused to be interviewed. If the potential respondent could not be reached on the first call, two callbacks were required before substituting another household. Substitutions were selected by interviewers from houses to the immediate left and second left, and then to the immediate right and second right. Residents living on the same street tended to be fairly homogeneous in their demographic composition and to have suffered a consistent level of damage due to similar types of building construction within each neighborhood. Thus, bias in making substitutions among available residents did not appear to be great. (Completion rates are described in Appendix B, Table 3.)

Characteristics of the Sample

The sample for Kauai was gathered from a set of scattered towns and villages, so some respondents have a living and working pattern which makes them more rural than those that live and work in the county seat, Lihue. The mean age of the respondents was 48.7 years. About 28% of the sample was age 60 or over. Family size averaged 3.59. Eighty-five percent of the sample had lived in single-family dwellings prior to the disaster, and 51% of the Kauai respondents owned their dwellings. The mean number of years that victim families had lived in the predisaster dwelling was 12.9 years. Since damage patterns followed housing quality, which was related to when the home was built, one would expect the longest-term residents to be included at a higher rate. The average number of years of residency on Kauai for the respondent households was 29.6.

Almost 20% of the sample declined to reveal their monthly incomes to the interviewers, but the average predisaster monthly income (after taxes) was put at \$1287. On Kauai, 56% of the household heads were in unskilled or skilled occupations, 28.9% in management or professions, and 23% were retired. This level of retirement is probably more a reflection of the long-term residency of the sample, and in particular the Japanese. In the sample, 52.8% of the heads of household had at least a high school diploma and 23.7% had at least a college degree.

Sample Ethnic Groups

The intent of the site selection process was to find towns in which there would be an adequate degree of ethnic difference in the population to provide for comparisons by ethnic grouping. Kauai represents considerable diversity. The sample of victims was 33.2% Caucasian, 25.1% Japanese-descent, 19.7% Filipino descent, and 9% Hawaiian, with the remaining 16% being Chinese or those representing themselves as being of mixed ethnic backgrounds (mostly various combinations of Asians and Pacific Islanders). This distribution can be taken as representative of the distribution of damage, by ethnic group, for those districts sampled. Ethnic group figures from 1980 for the island as a whole were 29% Caucasian, 29% Japanese descent, 26% Filipino descent, and 15% Hawaiian.

The religious affiliations of the respondents reflect the general pattern of religions among the various ethnic subgroups. About 12.5% of the heads of household claimed no religious affiliation, 37.7% were Catholic, 19% were Protestant, 18.8% were Buddhist, and the remaining 17% were a mix of other religions and sects.

With respect to age, the Kauai ethnic subgroups differed from each other: the Caucasian respondents tended to fall into the lower age groups; the Japanese heads of victim households were most likely to be 50 years old or older; and the Filipino heads were only somewhat less likely to be that old (Appendix B, Table 4). This reflects the latter group's long-term residency on the island. The Japanese have lived and worked for many decades in all of Hawaii and are well established in governmental positions and in the commercial life. As other indicators of this long-term settlement, 43% of the Japanese heads of household had lived in the same dwelling for 16 years or more, and 74% had lived on the island of Kauai for 20 years or more (Appendix B, Table 5). About 71% of the

Japanese respondents owned rather than rented their predisaster dwellings (Appendix B, Table 6).

The Caucasian sample is apparently the most transient of the four groups, with 58% of them renting their predisaster dwelling rather than owning it and over half of them not having lived in their predisaster dwellings more than five years. The lowest percentage of Caucasian victims (31.6%) had lived on the island 20 years or more. A fairly large proportion (59%) of the Filipinos also had been on the island 20 years or more, but the Filipinos as a group had moved around more than the Japanese. The Filipino victims were more likely to rent than to own (58% to 42%, respectively); 20% of the Filipino respondents had some special arrangement such as renting housing located on the plantation where they worked (included with the other rentals in Appendix B, Table 6).

With respect to family living arrangements, the Filipinos were the least likely to reside in one-person households (Appendix B, Table 7). The Caucasian victim households were more likely than the others, and in particular more likely than the Japanese, to contain minor children. This is probably due to a greater concentration of older heads of household in the other two groups. A greater proportion of large families were found among the Filipino group (Appendix B, Table 8).

The Filipino heads of household were more likely to be working, or to have worked, in an unskilled occupation than were respondents in the other groups (Appendix B, Table 9). The Japanese were likely to have skilled occupations or to be in managerial or professional occupations, but the Caucasians were the most likely of any of the groups to have managerial and professional occupations.

With respect to employment status, the Filipinos were the least likely to have been unemployed at the time of the hurricane (Appendix B, Table 10). The largest proportion of retirees were found among the Japanese and Filipino group in the sample, again reflecting the generally higher age of those groups. It appears that the Filipinos have tended to remain more in agricultural work--in particular on the sugar cane plantations--than have the Japanese, and they have less of a presence in the political and commercial life of the islands than the other groups. The Caucasians are more linked with the resort developments on the island, the more recent arrivals having moved there to work in resort communities

and businesses or, to a lesser extent, perhaps to retire.

The income distribution among the three ethnic groups in this victim sample was fairly similar, with the Japanese victim respondents being somewhat more likely than the other two groups to fall in the middle of the distribution (Appendix B, Table 11). About 20% of the respondents in the Kauai sample declined to give their income, this information being most frequently withheld by Caucasians and Japanese.

The Filipino victims had the lowest educational level of the three groups (Appendix B, Table 12). The Caucasian victim group had the highest education level. About equal portions of the Japanese and Caucasian respondent heads of household had at least a high school education, but the Caucasian sample was somewhat more likely to have had educational levels above high school, probably reflecting their younger average age compared to the Japanese.

Comparison of Ethnic Subgroups

The sample was very complex on Kauai. Caucasian, Japanese, or Filipino groups accounted for 78% of the total sample. Other identifications given were Hawaiian, Chinese, mixtures of other Pacific Islanders, and Portuguese, but none of these groups was present in large enough numbers to permit analysis. Thus, this analysis of ethnic group differences for Kauai will concentrate only on the Caucasian, Japanese, and Filipino subgroups. This means that the total number of cases used for ethnic comparisons is smaller than the total Kauai sample size indicated on tables describing all the victim households in the sample.

Effects of the Disaster

Damage and Loss

The extent of physical damage wrought by a natural event is an interaction between its dynamics and the characteristics of the built environment in its path. For example, the damage was not total for any of the communities selected. The pattern of the damage distribution in each community reflects the location of the built environment relative to the force of the event. In the villages on Kauai, the amount of damage was far greater where the structures were exposed not only to the high wind velocities of the hurricane, but to the storm surge as well. Location was the major key to the amount of damage, although building

construction could mediate to some extent the damage caused by either wind or water. Generally, only dwellings in the path of the high waves and storm surge suffered total destruction. Wind damage also was patterned by topography, so that similar dwellings in the same community might have suffered differing levels of damage depending on their location in relation to ridges and valleys. Thus, the social distribution of the damage follows the social distribution of dwelling location.

Following disasters, communities typically are surveyed for the purpose of estimating damages. These estimates provide the basis for the provision of disaster relief supplies and programs. Some rough "boundary" of the disaster-affected portion of a community can be assumed from these surveys. On Kauai, portions of the communities were left virtually undamaged. Respondents in this study were selected from among households designated as having had, or having been likely to have had, damage of any kind. Levels of damage for the respondents, thus, could range from very little to total. This variety makes it possible to examine the importance of levels of damage and loss for eventual success of recovery. It can be hypothesized that the need for and use of disaster assistance will be related to levels of damage and loss, and that eventual recovery will be related to levels of damage and loss on the part of individual families.

In some disasters, such as the Rapid City flood and many foreign disasters, families also are affected by the death and injury of members and relatives. The most devastating kind of loss--loss of life--did not occur during the disaster on Kauai, and the percent of families in the sample with injured members was small on Kauai (1.1%), eliminating this as an important variable in the analysis.

With respect to property losses (Appendix B, Table 13), the average level of structural damage to the individual dwelling of each respondent family was 32.8%. The average dollar loss reported by the respondents for structural damage was \$21,489, probably reflecting, in general, high average value of a residence on Kauai and, in particular, the types of dwellings destroyed in each community. The average percentage loss to the contents of an individual dwelling was 24% on Kauai; the mean dollar loss to contents was \$7,025. Kauai residents had the additional loss (typically in the \$100 to \$200 range) of perishables caused by the elec-

tricity having been off for at least a day or more (and typically for a week or more). A large percentage of the sample also had damage to vehicles or boats.

Few victim families on Kauai perceived themselves as much worse off than others in the disaster-stricken community. For those who did, there is a significant relationship between seeing themselves as worse off than others and having had a higher level of damage to their property.

Ethnic Group Comparisons. Some differences can be noted when damage distributions are examined for each of the ethnic groups being studied (Appendix B, Table 14); two seem notable. Although the percents are small for all three groups with respect to high levels of damage, the Caucasian group was most likely to have suffered a high level of damage to the structure or contents of dwellings. This is believed to be a reflection of their frequent ownership of beachfront houses which were destroyed. Otherwise, the damage patterns were similar, with the Japanese being slightly less likely than others to have suffered over 25% structural damage, and the Filipinos slightly more likely than the others to have suffered 26 to 50% damage. The differences between these two groups may reflect housing quality more than housing location.

Some differences are also evident among ethnic groups with respect to their perception of their postdisaster condition relative to others (Appendix B, Table 15). The Caucasians were less likely than the Japanese or Filipinos to see themselves as better off than others. To some extent, this may reflect their greater losses.

Dislocation and Disruption

Families affected by disasters such as Hurricane Iwa must make adjustments to their losses after the event has ended. Depending on the nature and extent of the damage, there is some sort of dislocation and disruption in the lives of these victims. It is useful to document the adjustments and their effects on families in order to influence the design of programs to facilitate disaster recovery. Some differences in adjustments may reflect not only family characteristics, but the nature of the disaster event. The degrees of dislocation and disruption are hypothesized to be related to the level of recovery a family will exhibit by a certain point after the disaster.

Household Dislocation. Dislocation refers to a family's having left its dwelling due to the disaster and the damage or fear that it caused. Respondents were asked if the household had to stay somewhere besides the dwelling for even one night following the disaster events: 37% of the respondents reported this on Kauai, with 3.6% of the families that left their homes camping in their yards.

Excess housing was available in the community to house those who were totally displaced from their predisaster housing. FEMA utilized available resort housing, such as non-owner-occupied condominiums. The extent to which it would have been utilized if not subsidized with federal funds is uncertain. (It might be added here that a major hurricane on the Gulf coast of the mainland United States could well result in a larger proportion, as well as absolute number, of homeless families than was the case on Kauai, where only a relatively small number of dwellings, mainly along one small section of coastline, were totally destroyed.)

Respondents were asked how many times the family had moved after the disaster, where they moved, and how long they stayed at each location. Once the hurricane was considered to be over, if a family was unable or unwilling to stay at their own home or at the home of a relative, they were most likely to move in with friends or neighbors. In talking to the Kauai victims, it often became evident that they had stayed with relatives or friends during or after the storm more because they wanted to be with others during a time of stress than because their homes were uninhabitable. However, the mean amount of time spent in the first location (Appendix B, Table 16) indicates many of the moves were not just for one night, but for several weeks.

The most commonly reported destination for the second move was back into one's own predisaster dwelling. As indicated by the earlier figures on levels of damage, the bulk of the dwellings were less than 50% damaged. The moving patterns indicate that, for the most part, the pattern was one of going into emergency housing of some sort and then back into the home once the crisis was perceived as past or adequate repairs had been made. When moving back into one's home still was not possible, renting was the most likely adjustment providing temporary housing beyond the emergency period. Some families may have gone from emergency housing back to their own homes for a brief time, and then into

a rental unit until they could finish repairs or find new permanent housing (Appendix B, Table 16). In addition, renters do not have the motivation to return to their predisaster location at the same rate as home owners.

In the cases reported in this chapter and the next, the official disaster relief programs included provision of federally subsidized temporary housing arrangements for victim families whose former dwellings were not habitable. These are counted as rental housing in Appendix B, Table 16. The destinations of dislocated disaster victims will undoubtedly vary according to the extent of housing provided by government programs. The long-term doubling up with relatives or friends has been noted in a foreign instance where housing was in short supply and housing programs for displaced victims were slow to materialize (Bolton, 1979).

Household Disruption. Media accounts of disasters generally focus on people's terror and trauma throughout the course of the event. People are asked to describe what they did during the hours of howling wind and rising water and how they felt about it. There is much less coverage of the longer-term disruptions that accompany the postdisaster clean-up and repair. Although 93% of the Kauai victim sample were still in, or back to, their predisaster address by the time these interviews were conducted, this was not accomplished without some inconvenience to the families. About 58% of the sample reported high levels of disruption from the dislocation (Appendix B, Table 17). In general, the respondent households felt themselves to be permanently located by the time of the interview, but about 19% of the Kauai sample indicated they intended to move again in the near future.

While it may not be necessary to leave a damaged home, repair work may be necessary to bring it back to its predisaster condition. About 78% of the total Kauai sample reported they had made repairs to their dwellings while living in them after the disaster. Living in a house under repair was found to be disruptive, with 38% of the sample reporting high levels of disruption for living in such homes. Much of the Kauai sample also had undergone the inconvenience of several days, or even weeks, without electricity.

Employment Disruption. The disaster caused damage to commercial and industrial property as well as homes. Of the heads of household in the

sample who were employed at the time of the disaster event, about 50% had their workplaces closed due to the disaster (Appendix B, Table 18). The place of work of heads of households in the sample was, on the average, closed 4.9 weeks.

Being out of work for a long period of time can be disruptive psychologically as well as economically, both to the employee and his or her families. On the other hand, it appears that it was not necessarily the case that having one's place of work closed meant either that there was no work to be done or that income was disrupted. Considerable variation probably can be found--depending on specific companies, community conditions, and victim's occupational level--with respect to the actual degree of disruption caused by the closure of work places after disasters. In some cases, the place of work might have been closed for business, but some of the employees brought in to do clean-up and repair work; moreover, they may or may not have been paid for this work. Volunteering to help out at one's place of employment after a disaster probably is not uncommon, especially among management and supervisory personnel. Certainly if this sort of task is seen as contributing to getting the business operating that much sooner, it will be viewed as desirable to be a participant.

It is also not the case that employees are without income while places of work are closed, although this may be truer for those who are paid an hourly wage than those on salary. Further, this loss of income may well be compensated for by social programs (unemployment compensation, food programs). Thus, the loss of work-related income in a U.S. disaster is probably not the economic hardship that it is in Third World disasters. In general, being out of work for disaster-related reasons for over a month was very uncommon in the two sites reported on in this and the following chapter, having affected about 7% of all heads of households in the Kauai sample, and 3% in the Coalinga sample (Appendix B, Table 18). Disaster-related unemployment was not an important variable with respect to overall community recovery, although it may have affected individual families.

Ethnic Group Comparisons. Differences were observed among ethnic groups with respect to dislocation (Appendix B, Table 19): Caucasians were more likely than Japanese or Filipinos to report having been dis-

located from their homes after the disaster. This is in keeping with the higher dwelling damage levels found for the Caucasian group. As noted earlier, the greater damage suffered by this group is believed to reflect the fact that larger numbers of them live directly facing or close to the ocean.

The temporary loss of employment due to the disaster was fairly evenly distributed across the three major ethnic groups in the Kauai sample. To some extent, the various ethnic groups are identified with different employment sectors and the damage on Kauai affected all three major employment sectors. There was substantial damage to the resort industry, with some of the longest-term closures being in that sector. The publicity of the damage also resulted in an accompanying reduction in demand for the undamaged facilities as tourists switched their reservations elsewhere. This probably accounts for the slightly greater likelihood for longer loss of work in the Caucasian group. Some closures, although generally of short duration, were also necessitated by wind damage to plantations and to the commercial and governmental district in Lihue, mostly affecting the Filipinos and the Japanese.

Psychological Distress

A few measures were included in the interview to serve as indicators of the extent to which the trauma and disruption of the disaster event, disaster losses, and the recovery process affected the levels of physical and mental health of the victim households. Since psychological distress was not a major focus of the study, these measures are cursory. However, they do provide some insights into the consequences of losses and disruption to these households and serve as an indicator of the level of emotional recovery achieved at each site.

When respondents were asked about their general health level relative to others their age, the majority reported their health as excellent or good (84.3%). Few Kauai respondents (10%) reported new or worsening health problems since the disaster, but most of the ones that had occurred were felt to be related to the disaster.

A strong association was found between emotional strain in the family and high levels of disruption from moving or repairs. Respondents were asked if anyone in their household had shown emotional strain as a result of the disaster. Forty-three percent of the households had a

member who showed strain on their mental health and well-being in the aftermath of the disaster (Appendix B, Table 20). As an indicator of the seriousness of the emotional strain in the postdisaster months, respondents were asked if they had sought help for this problem; only 12% of households contained a member who had sought professional counseling. With respect to emotional strain, there was little difference among the ethnic groups on Kauai (Appendix B, Table 21).

Use of Formal Disaster Assistance Programs

After Hurricane Iwa was declared a major national disaster, disaster assistance could be provided under the Federal Disaster Relief Act. As a result of the declaration, the site was served by Disaster Assistance Centers (DACs) in the weeks following the disaster. These centers are central points at which disaster victims can obtain information on the assistance programs available and be directed to those for which they are likely to be eligible. In conjunction with these centers, the Red Cross also provided mass feeding facilities for a substantial amount of time.

The use of formal disaster assistance programs was the central focus of this study. The findings can reveal the patterns of use, and elucidate the relationship of program use to eventual household recovery. The studies in this chapter and the next show some variation in the level and types of damage, and provide an opportunity to examine differences in assistance use across the ethnic groups in the communities studied.

Use of the DACs and Funds

While the timing and types of formal disaster assistance made available were similar in both Coalinga and Kauai, the propensity to use these assistance programs varied considerably. On Kauai, where DACs were placed in each of several villages in the affected area, 47.6% of the respondents said they had visited a DAC (Table V-1); about 23% of them reported going to a DAC more than twice. The mean number of visits was 2.1.

Not everyone who goes to a DAC is necessarily eligible for, or chooses to accept, specific kinds of disaster assistance. On Kauai, 42% reported that they actually received assistance from one of the programs (Table V-1). Subsequent figures in this subsection on the use of disaster assistance programs will refer to those households which actually

TABLE V-1
INDICATORS OF DISASTER ASSISTANCE USE
FOR THE KAUAI AND COALINGA SAMPLES

	KAUAI (N=446)		COALINGA (N=376)	
	N	%	N	%
A. Percent reporting having visited Disaster Assistance Center (DAC)	212	47.5	306	81.4
B. Percent of above reporting number of visits as:				
One	119	56.1	78	25.5
Two	43	20.3	87	28.4
Three or more	50	23.6	141	46.1
C. Percent receiving assistance from a local, state, or federal program	186	41.7	270	71.8

received assistance. That portion of the samples not receiving assistance is not indicated in the tables.

Typically, the most urgent needs immediately following a disaster are meals in the early hours and days, perhaps emergency shelter, and--later on--food items, clothing, and household goods. Voluntary private agencies such as the Red Cross and the Salvation Army, and to a lesser extent church groups, traditionally have been the front-line providers of these commodities. They give out either the specific items or vouchers with which items can be purchased. The Red Cross provides meals and uses the voucher system for other supplies; the Salvation Army offers goods which they have received through donations. An application process establishes loss and the unmet needs of those with no other means to recover their losses.

Assistance users on Kauai were more likely to have used the Red Cross (84%) than the Salvation Army (26%) (Table V-2). There were some reports that the Red Cross application procedure and imported personnel

TABLE V-2
HOUSEHOLD USE OF SPECIFIC DISASTER ASSISTANCE PROGRAMS
FOR KAUAI AND COALINGA SAMPLES (Percent)

PERCENT RECEIVING AID FROM*	KAUAI (N=186)	COALINGA (N=270)
Red Cross	84.5	79.3
Salvation Army	26.3	66.8
FEMA Temporary Housing Program	10.8	32.2
FEMA Minimum Repair Program	5.9	--
Small Business Administration	5.4	9.6
Food Stamps	17.3	76.8
Interfaith (Alliance/Task Force)	2.7	.4
Christian Disaster Relief	--	8.9
Individual Family Grants Program	6.5	20.7
Other Church or Civic	17.7	22.9

*Respondent households may have received assistance from more than one program.

had not been well received by the inhabitants of the close-knit communities on Kauai, who preferred the procedures of the Salvation Army. However, our findings did not indicate that such attitudes, if they existed, affected use patterns for the majority of assistance receivers.

In the course of these studies, it did become evident that the Red Cross has become virtually synonymous with disaster assistance. There is a possibility that respondents occasionally reported the use of the Red Cross when actually aid came from other, similar programs. Nonetheless, the high levels of use of the Red Cross and Salvation Army combined indicate that these programs clearly fulfill the role of the first-line provider. An effort was made to get respondents to recall accurately, and to distinguish among, the different programs they may have used. Generally, few respondents (less than 20% of the assistance receivers) reported the use of programs other than those of the Red Cross or Salvation Army.

TABLE V-3
NUMBER OF MAJOR DISASTER ASSISTANCE PROGRAMS USED
FOR THE KAUAI AND COALINGA SAMPLES*

TOTAL NUMBER USED	KAUAI		COALINGA	
	N	%	N	%
0	271	60.8	121	32.2
1	116	26.0	66	17.6
2	50	11.2	94	25.0
3	3	.7	67	17.8
4	6	1.3	28	7.4
		2.0		25.2
TOTAL	446	100.0	376	100.0

*Programs: Red Cross, Salvation Army, FEMA Temporary Housing, Small Business Administration, Individual Family Grants.

Kauai households were not very likely to have made use of either Food Stamps or the Individual Family Grants program (IFG). The IFG program is one of "last resort," and eligibility for an IFG indicates high loss and/or low income among those eligible, as well as inadequate coverage by other programs (or insurance) and ineligibility for programs such as SBA loans. Only 6.5% of respondents reported use of the IFG program on Kauai.

Table V-3 shows that only 2% of the Kauai households used more than one program. However, a full 25% of the Coalinga sample reported using three or four of the major programs. A strong association was found in both sites between the number of assistance programs used and the level of damage to dwelling structure and contents. This suggests that the lower program use on Kauai may have been related to the generally lower damage levels. However, as will be noted later, there was also a tendency for one of the ethnic groups on Kauai to not use disaster assistance programs at the same level as others and also for more losses on Kauai to have been covered by insurance.

Respondents who had received disaster assistance from the formal programs were asked to rate how important these disaster programs had

TABLE V-4

IMPORTANCE OF DISASTER ASSISTANCE TO RECOVERY
FOR THE KAUAI AND COALINGA SAMPLES

IMPORTANCE RATING*	KAUAI		COALINGA	
	N	%	N	%
A. Importance to Economic Recovery				
4	89	48.1	107	39.8
3	48	25.9	72	26.8
2	28	15.1	50	18.6
1	16	8.6	25	9.3
0	<u>4</u>	<u>2.2</u>	<u>15</u>	<u>5.6</u>
Total	185	100.0	269	100.0
No response	1		2	
Not applicable, did not use assistance programs	260		105	
B. Importance to Emotional Recovery				
4	84	45.4	110	40.9
3	49	26.5	80	29.7
2	29	15.7	37	13.8
1	16	8.6	16	5.9
0	<u>7</u>	<u>3.8</u>	<u>26</u>	<u>9.7</u>
Total	185	100.0	269	100.0
No response	1		2	
Not applicable, did not use assistance programs	206		105	

*". . . would you rate how important the aid you received from these aid programs has been in your household's recovering [economically] [emotionally] from the [disaster]?" 4 = Extremely Important; 0 = Not Important.

been in the recovery of the household (Table V-4). When asked about importance to their economic recovery, 74% of the Kauai respondents indicated that the assistance had been of high importance (3 or 4 on a scale of 0 to 4), and about 72% of them said the assistance was very important with respect to emotional recovery. In both sites, 90% or more of the respondents indicated that they were satisfied with the programs they had used.

Awareness of Assistance Programs

Multiple means were used to advertise the existence of the programs, but systematic evidence was not gathered about the publicity programs in terms of number of times a message was given, duration of the dissemination, and style of message delivery. Thus, it is not possible to say whether differences in the ways persons heard of programs are due to variations in the samples or to the information dissemination programs. Nonetheless, the observed differences in how people heard about the programs can be of some value.

Respondents reported that they were least likely to have learned of the program through mail literature or from seeing posters or fliers (Table V-5). The latter method was the least effective source of infor-

TABLE V-5
SOURCES OF INFORMATION ON ASSISTANCE PROGRAMS
FOR KAUAI AND COALINGA SAMPLES

SOURCE*	KAUAI		COALINGA	
	N	%	N	%
Television or radio	308	69.1	100	26.6
Newspapers	99	22.2	67	17.8
Posters, fliers, handbills	11	2.5	59	15.7
Word of mouth	288	64.6	315	83.8
Through the mail	7	1.6	25	6.6
Loudspeakers**	--	--	13	3.5

*Respondents may have mentioned more than one source.

**Loudspeakers were not included on the list read to respondents; they were given as an "other" response in Coalinga.

mation on Kauai, where only 2.5% reported using it. Newspapers were more successful, with 22% of the respondents reporting the newspaper as a source of information. The use of the radio and television for information on programs was even more successful on Kauai, where 69% reported those media as a source of information. This is a much higher percentage than in Coalinga (27%), and the difference is somewhat remarkable, in view of the fact that electricity was out for extended periods of time in some areas on Kauai. Thus people probably had and used portable radios and televisions immediately following the disaster on Kauai, and radios and TVs were also probably an important information source later on. Sixty-five percent of those on Kauai reported that their information came by word of mouth.

Ethnic Group Comparisons

As noted above, the Coalinga victims were more likely than the Kauai victims to have visited the official Disaster Assistance Centers (DACs). On Kauai, the Japanese were markedly less likely than the Caucasian or Filipino households to have visited a DAC (Table V-6). Although they tended to have the lowest amount of damage among the groups, they were not without damage; the difference is believed to reflect a choice on their part, perhaps deriving from cultural influences on attitudes toward the need for, and the appropriateness of, seeking outside assistance. Since the Japanese in the Hawaiian Islands typically have resided there for a very long time and typically wield considerable political power, this difference is not likely to be a reflection of anticipated discrimination or language difficulty. One other possible explanation would be the greater age of the group in this sample. Those Japanese who did visit one of the DACs were more likely than persons from the other two groups to make only one visit.

With respect to using one or more of the disaster assistance programs, the Japanese again differed from the Caucasians and Filipinos in the likelihood of using any of the disaster assistance programs (Table V-6): only about 20% of the Japanese households reported assistance used, compared to around 50% for the other two groups.

When the groups were compared with respect to which of the programs they used (Table V-7), the Filipinos stood out not only as most likely to use the Red Cross, but also as most likely to use both the Red Cross

TABLE V-6

COMPARISON OF ETHNIC GROUPS IN THE KAUAI AND COALINGA SAMPLES,
BY INDICATORS OF DISASTER ASSISTANCE USE (Percent)

	KAUAI			COALINGA	
	Caucasian (N=137)	Japanese (N=117)	Filipino (N=89)	Anglo (N=260)	Hispanic (N=116)
A. % reporting having visited DAC	53.3 (73)*	27.6 (32)	53.9 (48)	79.6 (207)	85.3 (99)
B. % of above reporting # of visits as:					
One	47.9	74.2	68.8	28.3	20.4
Two	23.3	12.9	18.8	30.7	24.5
≥Three	28.8	12.9	12.5	41.0	55.1
C. % receiving assistance from a local, state, or federal program	47.4 (65)	19.7 (23)	51.7 (46)	66.2 (172)	84.5 (98)

*Ns are given in parentheses.

TABLE V-7

COMPARISON OF ETHNIC GROUPS IN THE KAUAI AND COALINGA SAMPLES,
BY USE OF SPECIFIC DISASTER ASSISTANCE PROGRAMS (Percent)*

PROGRAM	KAUAI			COALINGA	
	Caucasian (N=65)	Japanese (N=23)	Filipino (N=46)	Anglo (N=172)	Hispanic (N=98)
Red Cross	80.0	87.0	93.5	77.3	82.7
Salvation Army	23.1	21.7	41.3	61.3	76.5**
SBA	4.6	13.0	0.0**	9.8	9.1
Food Stamps	16.9	8.7	4.5	73.4	82.7
FEMA Temporary Housing	15.4	0.0	8.7**	23.1	43.4**

*Each row of figures for each of the samples represents a separate comparison; e.g., the first row is a comparison among three ethnic groups in the Kauai sample with respect to their use of Red Cross assistance, and a comparison between two ethnic groups in the Coalinga sample.

**Differences among or between the ethnic groups in the sample were significant at the .05 level or better (Chi-square).

TABLE V-8
COMPARISON OF ETHNIC GROUPS IN THE KAUAI AND COALINGA SAMPLES,
BY NUMBER OF MAJOR DISASTER ASSISTANCE PROGRAMS USED* (Percent)

TOTAL NUMBER USED	KAUAI			COALINGA	
	Caucasian (N=89)	Japanese (N=117)	Filipino (N=137)	Anglo (N=260)	Hispanic (N=116)
0	56.2	81.2	50.6	38.1	19.0
1	30.7	13.7	24.7	19.6	12.9
2	10.2	5.1	22.5	22.7	30.2
3	.7	0	0	12.7	29.3
4	<u>2.2</u>	<u>0</u>	<u>2.2</u>	<u>6.9</u>	<u>8.6</u>
Total %	100.0	100.0	100.0	100.0	100.0

*Programs: Red Cross, Salvation Army, FEMA Temporary Housing, Small Business Administration, Individual Family Grants.

and the Salvation Army as sources of necessary items. The Japanese were more likely than the other groups to have made use of SBA loans. The Caucasians, who, as seen earlier, were more likely than others to have suffered extensive damage to their dwellings, were found to be the most likely to have used the FEMA temporary housing program.

With respect to the total number of programs used (Table V-8), there was some tendency for the Filipinos to have made the greatest use of the programs, but the most noticeable anomaly was that of the non-use by the Japanese. The association between level of damage and number of programs used was found to hold in both Coalinga and Kauai for all ethnic groups.

The various groups were compared with respect to their perceptions of the importance of the aid they received for their economic and emotional recovery. However, virtually no differences were observed among the three groups on Kauai. Similarly, comparisons of the groups with respect to satisfaction with the programs also revealed virtually no difference among the groups, and the comparison of information sources used by the groups to get program information shows no difference among the three groups on Kauai (Table V-9).

TABLE V-9
COMPARISON OF ETHNIC GROUPS IN THE KAUAI AND COALINGA SAMPLES,
BY SELECTED INFORMATION SOURCES (Percent)

SOURCE*	KAUAI			COALINGA	
	Caucasian (N=137)	Japanese (N=117)	Filipino (N=89)	Anglo (N=260)	Hispanic (N=116)
Television or radio	70.1	75.2	69.7	31.1	16.4**
Newspaper	19.7	25.6	22.5	23.5	5.2**
Posters, fliers, handbills	3.4	0.0	1.5	19.2	7.8**
Word of mouth	63.5	61.5	69.7	86.2	78.4

*Each row of figures for each of the samples represents a separate comparison; e.g., the first row is a comparison among three ethnic groups in the Kauai sample with respect to their use of Red Cross assistance, and a comparison between two ethnic groups in the Coalinga sample.

**Differences among or between the ethnic groups in the sample were significant at the .05 level or better (Chi-square).

Alternative Adjustments to Losses

The disaster victims in the study sites were not necessarily totally dependent on disaster programs to help them cope with their damages and losses. The study also examined three other adjustments to losses: insurance, the use of personal resources and strategies, and aid from relatives and friends.

Insurance

Insurance proved to be a fairly important adjustment to the disaster for Kauai households. It was more important than in Coalinga, since earthquake insurance was far less likely to be held by those respondents than was insurance for wind damage by the Kauai households. In fact, 88% of the households in the Kauai sample reported having insurance coverage.

In many instances, the applicability of insurance was disputed for those along the coast, as it was difficult to establish whether the

damage had been done by wind or waves. Insurers generally did not consider damage by water to be covered under wind damage, and disputes over insurance claims for the waterfront homes centered around whether or not wind damage preceded the damage from the waves. Some of the Kauai inhabitants were eligible for flood insurance under the National Flood Insurance Program, but, to a great extent, the dwellings which received the most wave damage were not in an area covered by that program. (Furthermore, eligibility cannot be equated with use of the program). Although 9% of the respondents reported that their insurance claims were not yet settled at the time of the interviews, insurance coverage was much better on Kauai in general, where the average proportion of the loss covered by insurance was 73%, than in Coalinga where the proportion was only 40% (Table V-10).

TABLE V-10
INSURANCE USE FOR DISASTER LOSSES FOR THE
KAUAI AND COALINGA SAMPLES

PERCENT OF LOSSES PAID BY INSURANCE	KAUAI (N=446)		COALINGA (N=376)	
	N	%	N	%
No coverage	203	45.8	172	46.4
0% paid for	18	4.1	66	17.8
1-25%	18	4.1	29	7.8
26-50%	27	6.1	34	9.2
51-75%	39	8.8	18	4.8
76-99%	39	8.8	20	5.4
100% paid for	<u>99</u>	<u>22.3</u>	<u>32</u>	<u>8.6</u>
Total	443	100.0	371	100.0
No Response	3		5	
Mean % covered for those with insurance		73.0		40.0

TABLE V-11				
LEVEL OF LOSSES COVERED BY EITHER INSURANCE OR ASSISTANCE PROGRAMS FOR THE KAUAI AND COALINGA SAMPLES				
PERCENT OF LOSSES COVERED	KAUAI		COALINGA	
	N	%	N	%
0%	67	15.9	70	19.1
1-25%	65	15.4	98	26.7
26-50%	45	10.7	57	15.5
51-75%	60	14.2	36	9.8
76-99%	69	16.4	37	10.1
100%	<u>116</u>	<u>27.5</u>	<u>69</u>	<u>18.8</u>
Total	422	100.0	367	100.0
Mean % of losses covered by a combination of insurance and assistance		58%		44%

When respondents were asked about the percentage of their total losses which were covered by the combination of insurance and assistance programs, Kauai respondents indicated an average coverage of 58% (Table V-11). Kauai respondents indicated a higher mean dollar figure for insurance and assistance received (\$12,320) than did respondents in Coalinga (\$5,829). Similar portions of the Coalinga sample (36%) and the Kauai sample (31%) reported they had money problems trying to replace property losses.

Personal Resources

Although some portion of the households recouped 100% of their losses through a combination of insurance and disaster assistance (27.5%) (Table V-11), most had some losses which were not covered in this way. A series of items was included in the interview to determine how people dealt with such losses. Persons may decide not to replace some things, either because they do not need them at that time or because other items received higher priority. Another strategy used when unexpected expenses are incurred is that of restructuring the household budget: foregoing

TABLE V-12
STRATEGIES FOR RESPONDING TO UNINSURED LOSSES
FOR THE KAUAI AND COALINGA SAMPLES (Percent)

STRATEGY USED*	KAUAI (N=446)	COALINGA (N=376)
Decided not to replace certain things	42.8	64.4
Did without special items (e.g., entertainment)	26.2	17.0
Used money or loans from assistance programs	10.5	30.9
Used money or loans from relatives or friends	14.8	9.8
Used savings or other personal resources	37.9	42.0

*Respondent households may have used more than one strategy.

some discretionary expenses (e.g., movies, expensive food items) in order to use the money for necessities. Many families also have savings that can be used to close gaps in expenditures, or they may have received loans and grants from friends or relatives.

In both Coalinga and Kauai, at least 80% of the households indicated that they had engaged in at least one of these strategies, some in more than one (Table V-12). The most frequently mentioned strategy was that of deciding not to replace certain things (reported by 43% on Kauai), followed by using savings or other personal money resources (38%). Consistent with the lower use of formal disaster assistance programs on Kauai, 11% of the Kauai respondents--compared with 31% in Coalinga--reported having used loans or grants from disaster assistance programs. On the other hand, 26% of the households in the Kauai sample indicated that they made adjustments in their discretionary spending ("went without things") to be able to replace necessary items.

Ethnic Group Comparisons. Differences were found among the various

TABLE V-13
COMPARISON OF ETHNIC GROUPS IN THE KAUAI AND COALINGA SAMPLES,
BY COVERAGE OF LOSSES BY INSURANCE
AND BY EITHER INSURANCE OR ASSISTANCE PROGRAMS (Percent)

INSURANCE COVERAGE OF LOSSES	KAUAI			COALINGA	
	Caucasian (N=137)	Japanese (N=116)	Filipino (N=88)	Anglo (N=256)	Hispanic (N=115)
No coverage	59.8	24.1	47.7	33.2	75.7
0% paid for	2.9	3.5	7.9	19.9	13.0
1-25%	4.4	3.4	3.4	10.5	1.7
26-50%	6.6	8.6	3.4	11.7	3.5
51-75%	9.5	8.6	5.7	6.3	1.7
76-99%	3.6	11.2	9.1	7.8	0.0
100% paid for	13.1	40.5	22.7	10.5	4.3
INSURANCE OR ASSISTANCE COVERAGE OF LOSSES	(N=129)	(N=115)	(N=84)	(N=255)	(N=112)
0%	20.9	13.0	14.3	18.3	21.4
1-25%	24.8	6.1	14.3	26.7	26.8
26-50%	11.6	9.6	8.3	14.9	17.0
51-75%	10.9	11.3	15.5	8.6	12.5
76-99%	10.1	14.8	19.0	12.8	3.6
100% paid for	21.7	45.2	28.6	18.8	18.8

ethnic groups with respect to insurance coverage (Table V-13). The Japanese were found to be more likely than the other two groups not only to have had insurance coverage of special kind, but to have had more than 75% of their losses covered by insurance. This fact probably explains their generally lower propensity to use disaster assistance programs. But a larger question still remains, then, concerning why the Japanese were more likely to have insurance than were other groups. Given that the Japanese do not differ significantly from Caucasians regarding education or income levels, the most likely explanation seems to be some cultural characteristic.

In some cases, lack of insurance was made up for by disaster assistance programs (Table V-13). This combination of aid does not result in much change in the pattern for the Japanese but, to some extent, closes the gap between them and coverage achieved by the other two groups--especially the Caucasians.

The comparison of personal strategies used to deal with losses not covered by insurance show few differences among the groups on Kauai (Table V-14). As would be expected, the Japanese exhibited a difference

TABLE V-14
COMPARISON OF ETHNIC GROUPS IN THE KAUAI AND COALINGA SAMPLES,
BY STRATEGIES FOR RESPONDING TO UNINSURED LOSSES (Percent)

STRATEGY USED*	KAUAI			COALINGA	
	Caucasian (N=137)	Japanese (N=117)	Filipino (N=89)	Anglo (N=260)	Hispanic (N=116)
Decided not to replace certain things	52.5	52.6	50.7	68.5	55.2**
Did without special items	35.0	26.9	28.0	10.0	32.8**
Used money or loans from relatives or friends	19.2	16.7	17.3	11.5	6.0
Used money or loans from assistance programs	18.3	5.1	12.0**	32.7	26.7
Used savings or other personal resources	45.8	44.9	37.3	44.2	37.1

*Respondent households may have used more than one strategy. Each row of figures for each of the samples represents a separate comparison; e.g., the first row is a comparison among three ethnic groups in the Kauai sample with respect to their use of Red Cross assistance, and a comparison between two ethnic groups in the Coalinga sample.

**Differences among or between the ethnic groups in the sample were significant at the .05 level or better (Chi-square).

from the other groups with respect to the use of loans from the disaster assistance programs, but otherwise the three groups are fairly similar in their adjustments.

Aid from Friends and Relatives

Neighbors, friends, and relatives long have been acknowledged as important sources of help in disasters and other emergencies. Relatives stand out as the most important source of help; in the social science literature it has been shown that they are expected to provide, in general, just about anything which is needed. In particular, they may be the most likely source of long-term aid--such as a shared home or financial assistance. Although the actual discharging of these responsibilities varies, it has consistently been found to be a central feature of disaster recovery.

Neighbors and friends also can play an important role during crises. Neighbors provide various kinds of immediate support and assistance primarily because of their physical proximity to one another; friends also often provide material and emotional aid in crises even though they do not live nearby. Seeing to those near to one in location and near to one in blood probably takes precedence over checking on friends in the immediate aftermath of a disaster, although much variation can be expected.

Receipt of Aid. In order to establish the availability of primary group aid ("social support"), respondents were asked some very general questions about the presence in the community of relatives, friends, and neighbors to whom they felt close and about their level of interaction with these persons. Many respondents on Kauai and in Coalinga (70%) indicated very large numbers of close relatives and friends, which would imply at least the potential for obtaining help from primary groups.

The actual informal aid sources used are shown in Table V-15. Sixty-five percent of the households in the Kauai sample received aid from informal sources. As with disaster assistance programs, the use of this type of aid was strongly associated with the level of damage sustained. In general, however, Kauai households were less likely than the Coalinga households to have received aid through informal systems, with 35% of the respondents saying they had received no aid from relatives, friends, or neighbors; while in Coalinga only 20% reported receiving no aid from

TABLE V-15
INFORMAL AID SOURCES USED FOR THE KAUAI AND COALINGA SAMPLES

	KAUAI		COALINGA	
	N	%	N	%
A. Number of Informal Aid Sources Used*				
NUMBER OF SOURCES				
0	156	35.0	74	19.7
1	113	25.3	145	38.6
2	93	20.9	84	22.3
3	<u>84</u>	<u>18.8</u>	<u>73</u>	<u>19.4</u>
Total	446	100.0	376	100.0
B. Receipt of Aid from Relatives, Friends, and Neighbors				
RELATIVES				
Received aid from relatives	223	50.0	251	66.8
Aid offered, but did not accept	63	14.1	45	12.0
Not offered aid	<u>160</u>	<u>35.9</u>	<u>80</u>	<u>21.3</u>
Total	446	100.0	376	100.0
FRIENDS				
Received aid from friends	198	44.4	176	46.8
Aid offered, but did not accept	89	20.0	85	22.6
Not offered aid	<u>159</u>	<u>35.6</u>	<u>115</u>	<u>30.6</u>
Total	446	100.0	376	100.0
NEIGHBORS				
Received aid from neighbors	130	29.1	105	27.9
Aid offered, but did not accept	77	17.3	62	16.5
Not offered aid	<u>239</u>	<u>53.6</u>	<u>209</u>	<u>55.6</u>
Total	446	100.0	376	100.0

*Relatives, friends, or neighbors only; maximum number of sources is three.

TABLE V-16
TYPES OF AID RECEIVED FROM INFORMAL SOURCES FOR
KAUAI AND COALINGA SAMPLES (Percent)

TYPE OF AID RECEIVED*	KAUAI			COALINGA		
	Relatives	Friends	Neighbors	Relatives	Friends	Neighbors
Food	29.1	21.5	16.1	38.6	13.0	6.1
Shelter	15.7	12.3	2.7	36.7	12.2	2.7
Clothing	6.5	4.5	2.0	5.6	1.9	.3
Money	17.5	6.3	1.6	16.0	3.5	0
Emotional/ Moral Support	34.3	.2	15.0	50.3	36.4	22.9
Labor	21.7	21.5	13.9	14.1	4.8	2.9
Transportation	7.2	4.7	3.4	10.6	4.0	1.9
Household or Personal Items	14.8	8.7	4.3	15.2	2.4	1.3
Advice or Information	23.1	15.9	8.5	24.5	12.8	5.3

*Household may have received more than one type of aid.

these persons.

Respondents were shown a list containing nine types of aid typically received from relatives and friends and asked to indicate which they had received after the disaster: food, shelter, clothing money, moral support, labor, transportation, household items, or advice. Table V-16 shows the distribution of these kinds of aid from each of the informal sources--relatives, friends, and neighbors. Kauai households appear to have received food from across their primary groups, perhaps because the lack of electricity for such a long period led people to get together to cook and to use up food in danger of spoiling.

Importance of Aid. When asked about the importance of aid from these informal systems, around half or more of the respondents felt it had been important (Table V-17). In particular, this aid was viewed as more important to emotional recovery than to economic recovery. In comparison, the formal programs were considered equally important to both

TABLE V-17

IMPORTANCE OF INFORMAL AID SYSTEMS TO RECOVERY FOR THE
KAUAI AND COALINGA SAMPLES

IMPORTANCE RATING*	KAUAI			COALINGA	
	N	%		N	%
A. Importance to Economic Recovery					
4	116	40.6] 59.8	98	32.9
3	55	19.2		46	15.4
2	36	12.6		44	14.8
1	35	12.2		37	12.4
0	<u>44</u>	<u>15.4</u>		<u>73</u>	<u>24.5</u>
Total	286	100.0		298	100.0
No response	4			2	
Not applicable, did not receive informal aid	156			76	
B. Importance to Emotional Recovery					
4	180	62.9] 82.5	183	61.4
3	56	19.6		58	19.5
2	35	12.2		27	9.1
1	6	2.1		18	6.0
0	<u>9</u>	<u>3.1</u>		<u>12</u>	<u>4.0</u>
Total	286	100.0		298	100.0
No response	4			2	
Not applicable, did not receive informal aid	156			76	

*"... would you rate how important the aid you received from your relatives, friends, and neighbors has been in your household's recovering [economically] [emotionally] from the [disaster]?" 4 = Very Important; 0 = Not Important.

economic and emotional recovery (Table V-4 above).

Ethnic Group Comparisons

When the number of sources of informal aid are examined among the ethnic groups, it is clear (Table V-18) that on Kauai the Caucasian group

TABLE V-18

COMPARISON OF ETHNIC GROUPS IN THE KAUAI AND COALINGA SAMPLES,
BY NUMBER OF INFORMAL SYSTEM SOURCES OF AID

NUMBER OF SOURCES*	KAUAI			COALINGA	
	Caucasian (N=137)	Japanese (N=117)	Filipino (N=89)	Anglo (N=260)	Hispanic (N=116)
0	24.1	47.0	40.4	18.1	23.3
1	29.9	19.7	29.2	35.4	45.7
2	27.7	17.1	13.5	24.2	18.1
3	<u>18.2</u>	<u>16.2</u>	<u>16.9</u>	<u>22.3</u>	<u>12.9</u>
Total %	100.0	100.0	100.0	100.0	100.0

*Relatives, friends, and neighbors only. Maximum of three sources.

was more likely to have received aid from a wider range of their primary groups than the other ethnic groups. For all the respondents, relatives do not stand out clearly as the most important of the three potential sources (Table V-19), although the extent to which they were a source is similar across all three ethnic groups. For the Caucasians, friends as the most important source differentiated them from the Japanese and Filipinos.

Overall Recovery

Respondents were asked to rate their level of recovery at the time of the interview, eight months after the disaster. The amount of time between the disaster and the survey allows for the disaster assistance programs to have been utilized, and for people to have made economic and emotional adjustments after the disaster. On the other hand, it is soon enough after the disaster that there still is variance in the level of recovery and, thus, the possibility of ascertaining influences on the

TABLE V-19

COMPARISON OF ETHNIC GROUPS IN THE KAUAI AND COALINGA SAMPLES,
BY RECEIPT OF AID FROM INFORMAL SOURCES (Percent)

	KAUAI			COALINGA	
	Caucasian (N=137)	Japanese (N=117)	Filipino (N=89)	Anglo (N=260)	Hispanic (N=116)
RECEIPT OF AID FROM RELATIVES					
Received aid from relatives	48.9	42.7	48.3	68.5	62.9
Aid offered, but did not accept	13.1	16.2	12.4	13.5	8.6
Not offered aid by relatives	<u>38.0</u>	<u>41.0</u>	<u>39.3</u>	<u>18.1</u>	<u>28.4</u>
Total %	100.0	100.0	100.0	100.0	100.0
RECEIPT OF AID FROM FRIENDS					
Received aid from friends	55.5	34.2	34.8	51.2	37.1
Aid offered, but did not accept	21.9	17.1	19.1	25.0	17.2
Not offered aid by friends	<u>22.6</u>	<u>48.7</u>	<u>46.1</u>	<u>23.8</u>	<u>45.7</u>
Total %	100.0	100.0	100.0	100.0	100.0
RECEIPT OF AID FROM NEIGHBORS**					
Received aid from neighbors	35.8	25.6	23.6	31.2	20.7
Aid offered, but did not accept	18.2	12.8	22.5	18.8	11.2
Not offered aid by neighbors	<u>46.0</u>	<u>61.6</u>	<u>53.9</u>	<u>50.1</u>	<u>68.71</u>
Total %	100.0	100.0	100.0	100.0	100.0

*Differences among ethnic groups in Kauai were significant at the .05 level or better; differences between ethnic groups in Coalinga were significant at the .01 level or better (Chi-square).

**Differences among ethnic groups in Coalinga only were significant at the .05 level or better.

TABLE V-20
PERCEPTION OF ECONOMIC AND EMOTIONAL RECOVERY
FOR THE KAUAI AND COALINGA SAMPLES

RECOVERY RATING*	KAUAI		COALINGA	
	N	%	N	%
A. Perception of Economic Recovery				
4	198	44.4	119	31.6
3	158	35.4	130	34.6
2	65	14.6	78	20.7
1	16	3.6	35	9.3
0	<u>9</u>	<u>2.0</u>	<u>14</u>	<u>3.7</u>
Total	446	100.0	376	100.0
B. Perception of Emotional Recovery				
4	274	61.4	132	35.1
3	118	26.5	147	39.1
2	39	8.7	67	17.8
1	10	2.2	23	6.1
0	<u>5</u>	<u>1.1</u>	<u>7</u>	<u>1.9</u>
Total	446	100.0	376	100.0

*"... would you rate how well recovered [economically] [emotionally] your household is from the [disaster]?" 4 = Extremely Important; 0 = Not Important.

rate of recovery. Respondents were asked to make separate ratings for the household's economic recovery and its members' emotional recoveries.

Group Recovery Levels

At about eight months after the disaster, the level of household recovery differed for Coalinga and Kauai (Table V-20). Economic recovery at the level of the family appears to have progressed at a more rapid rate for Kauai than for Coalinga, with 44% of those on Kauai rating themselves as completely recovered. Kauai residents did claim to have

suffered considerable secondary economic impact from the temporary drop off in tourism following Hurricane Iwa. With respect to emotional recovery, many more Kauai victims (61%) than Coalinga victims (35.1%) felt their households had achieved complete recovery.

This is consistent with the differences in disaster events and damage levels in the two communities. With the exception of the most badly damaged housing and resort area on the beachfront, well out of view of most of the island's long-term inhabitants, the Kauai residents were not (by eight months after Hurricane Iwa) faced with the reminders of devastation that greeted Coalinga residents daily. This is probably also why emotional recovery on Kauai outpaced economic recovery. This difference in household recovery also could be related to other factors; for example, it could rest with the effectiveness with which disaster programs were actually implemented in the community, or with a cultural propensity for the inhabitants of Kauai to be more positive about circumstances.

Recovery rates for the different ethnic groups (Table V-21) follow the distribution of damage across the groups (see Appendix B, Table 14, above). Indeed, it seems likely that differences between ethnic groups in recovery level as well as in usage of disaster assistance can be attributed in part to differences in damage incurred unevenly across the groups. For all three groups on Kauai, emotional recovery far outstripped economic recovery but, in keeping with the damage distribution, the Caucasian victims reported the lowest levels of both kinds of recovery. Again, among the three groups, the most extreme difference in disaster assistance use was found with the Japanese. These victims as a group were very unlikely to have used programs or even to have visited a DAC. Explanations for this include not only their generally lower damage levels but also their higher coverage by insurance--both possibly attributable to a cultural value of self-sufficiency.

In general, differences in ethnic group recovery could also be due to the differential application of assistance, or to various socio-economic factors that come into play when financial crises are experienced and a complex institutional system must be negotiated to obtain assistance. In addition, some element of the differences could lie in the tendency of various ethnic groups to view their progress from differ-

TABLE V-21
COMPARISON OF ETHNIC GROUPS IN THE KAUAI AND COALINGA SAMPLES,
BY PERCEPTION OF ECONOMIC AND EMOTIONAL RECOVERY (Percent)

RECOVERY RATING*	KAUAI			COALINGA	
	Caucasian (N=137)	Japanese (N=117)	Filipino (N=89)	Anglo (N=260)	Hispanic (N=116)
A. Perception of Economic Recovery					
4	38.0	56.4	47.2	34.6	25.0
3	38.7	29.9	37.1	33.0	37.9
2	16.1	11.1	6.7	19.6	23.3
1	3.6	.9	7.9	8.8	10.3
0	3.6	1.7	1.1	3.9	3.4
B. Perception of Emotional Recovery					
4	54.7	72.6	62.9	39.6	25.0
3	32.1	19.7	24.7	38.5	40.6
2	9.5	6.8	7.8	14.2	25.9
1	2.2	.9	4.5	6.2	6.0
0	1.5	--	--	1.5	2.4

*Level of recovery at about 8 months after the disaster.

ent perspectives, resulting in similar situations being reported in different ways.

Explaining Economic Recovery

A simple model of the hypothesized relationship of the central variables is provided in Figure V-1. This model assumes that patterns of long-term dislocation and use of disaster assistance programs can be explained by three primary influences: level of the disaster-related damage, loss of work, and predisaster socioeconomic status. Further, it assumes that the level of economic recovery reported at eight months after the disasters can be explained to some extent by the combination of

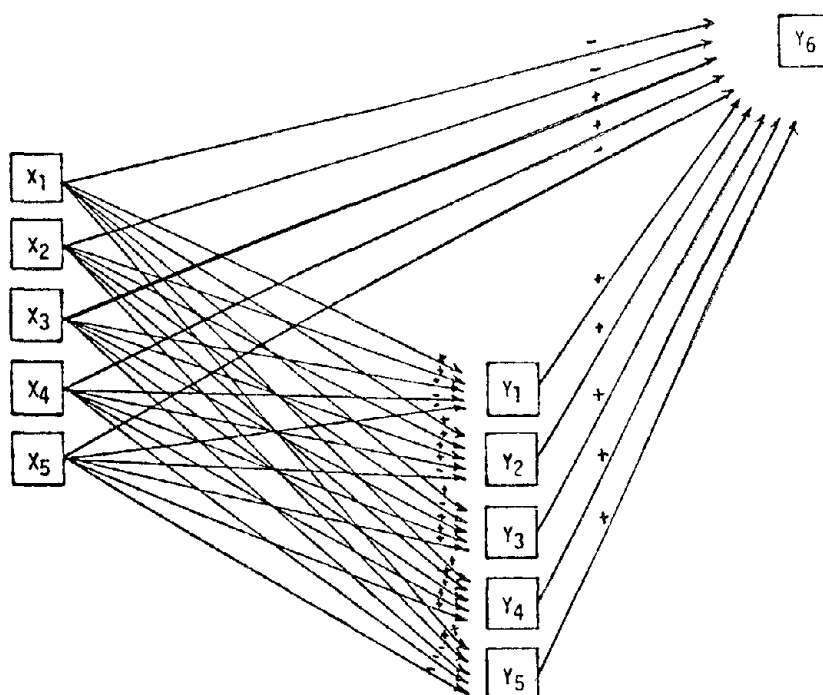


FIGURE V-1
PATH DIAGRAM OF THE FAMILY
RECOVERY MODEL

Where: X_1 = Percent of Damage to Dwelling Structure and Contents
 X_2 = Number of Weeks out of Work (Head of Household)
 X_3 = Education Level (Head of Household)
 X_4 = Family Income Level
 X_5 = Age (Head of Household)
 Y_1 = Number of Disaster Assistance Programs Used
 Y_2 = Number of Sources of Informal Aid
 Y_3 = Use of Insurance
 Y_4 = Percent of Losses Covered by Insurance or Disaster Assistance
 Y_5 = Number of Post-Disaster Household Moves
 Y_6 = Self-assessment of Economic Recovery
 e = Error Variance

these variables.

The variables in the model have been measured in the following ways. The perception of recovery is based on a five-point rating given by the respondent regarding the degree of economic recovery achieved by the household by the time of the interview, with a score of 4 indicating complete recovery. The use of the disaster assistance is measured as the total number of major disaster assistance programs used by the household after the disaster; this can vary from 0 to 4. The use of informal aid is measured in terms of the use of aid from three major primary groups (relatives, friends, and neighbors), and thus can vary from 0 to 3. The use of insurance was measured by whether or not the household received any insurance payment (excluding comprehensive coverage from automobile damage) to apply toward its losses, with 0 representing no insurance payments and 1 representing the receipt of an insurance payment of any amount. The percent of losses covered refers to the percentage of all losses that were recouped through some combination of the use of assistance programs and insurance payments, ranging from 0% to 100%.

Damage to dwelling was calculated as the summation of the percent of damage to both structure and to the dwelling's contents; it varies from 0% to 100%. In order to keep this damage relevant to economic recovery, specifically, renters were re-coded as having 0% structural damage. This is predicated on the belief that renters do not incur direct economic costs from structure loss, that being the economic responsibility of the landlord. However, renters may be forced into moving, just as are owners, if the dwelling was made uninhabitable. Thus, this coding policy somewhat attenuates the hypothesized relationship between damage levels and residential dislocation in favor of the relationship between level of damage as an indicator of economic loss and economic recovery.

Weeks out of work refers to the total number of weeks the head of household was without work due to the disaster-related closure of his or her workplace, varying from 0 to 30, although there was very little variance for the either Kauai or Coalinga. Education is measured from low to high levels of education completed, income from low to high monthly household income, and age from low to high for the head of household.

The hypothesized direction of the relationship is indicated in Figure V-1. In traditional models of assistance, which underlie the

provision of many kinds of relief services for various kinds of crises, the expected direction of the relationships is based on a general, two-part hypothesis: 1) the higher the need, the more assistance used; and 2) the more assistance used, the more rapid the recovery from the crisis. The analytical technique applied here is not the best approach for testing that general hypothesis, since damage would have to be held constant. However, a path analytical technique has been selected for the purpose of determining the relative effect on disaster recovery of each of the following specific factors: age, socioeconomic status, disaster losses, disaster dislocation, and use of assistance.

In order to examine differences in the importance of these variables to separate ethnic groups, ethnic group membership has been held constant. A multiple regression has been performed on the variables in the model for each of the five ethnic groups studied in both Kauai and Coalinga.

An Ethnic Group Comparison

A comparison of the model across the various ethnic groups indicates some difference in the variables found to exert the most influence on the level of recovery. A detailed discussion of each of the observed variations would be more tedious than revealing for our purposes here, so discussion will be held to a general overview of what the analysis seems to indicate about recovery.

The path coefficients for each dependent variable and the level of variance explained are presented initially in tabular form. There is a separate set for each of the ethnic groups, as follows: Caucasian, Kauai (Table V-22); Japanese, Kauai (Table V-23); Filipino, Kauai (Table V-24); Anglo, Coalinga (Table V-25); and Hispanic (Table V-26). Significant path coefficients and multiple R^2 s are designated in the tables; discussion is limited to these significant indicators only. It should be noted that sample size exerts some degree of influence on significance, and that the size of the groups being analyzed varies from 89 (Filipino group) up to 260 (Anglo group).

From among the ethnic groups, the variables in the model are best suited to explaining recovery for the Caucasian group in the Kauai sample. In that instance, 33% of the variance in recovery is explained by the variables used (Table V-22). The second best fit of the model is

TABLE V-22

ESTIMATES OF THE STRUCTURAL PARAMETERS OF THE PATH MODEL
OF FAMILY RECOVERY: CAUCASIAN GROUP, KAUAI (N=137)

Dependent Variable	Independent Variable	Path Coefficient	Explained Variance	Error Variance
Use of Disaster Assistance (Y ₁)	Damage to Dwelling (X ₁)	.19*	.04	.96
	Weeks out of Work (X ₂)	.03		
	Education (X ₃)	.06		
	Income (X ₄)	-.04		
	Age (X ₅)	-.06		
Use of Informal Aid (Y ₂)	Damage to Dwelling	.31*	.12	.88
	Weeks out of Work	.03		
	Education	.16		
	Income	-.01		
	Age	-.01		
Use of Insurance (Y ₃)	Damage to Dwelling	-.03	.22	.78
	Weeks out of Work	-.10		
	Education	-.05		
	Income	.19*		
	Age	.40*		
Percent of Losses Covered (Y ₄)	Damage to Dwelling	-.14	.13	.82
	Weeks out of Work	-.11		
	Education	-.12		
	Income	.14		
	Age	.26*		
Household Moves (Y ₅)	Damage to Dwelling	.43*	.23	.77
	Weeks out of Work	.10		
	Education	.14		
	Income	.02		
	Age	-.17		
Perception of Recovery (Y ₆)	Damage to Dwelling	-.18	.33	.67
	Weeks out of Work	-.26*		
	Education	-.12		
	Income	-.17*		
	Age	.02		
	Use of Disaster Assistance	-.32*		
	Use of Informal Aid	-.01		
	Use of Insurance	-.21*		
	Percent of Losses Covered	.19*		
	Household Moves	-.01		

* Path coefficients significant at the 0.5 level or better.

TABLE V-23

ESTIMATES OF THE STRUCTURAL PARAMETERS OF THE PATH MODEL
OF FAMILY RECOVERY: JAPANESE ETHNIC GROUP, KAUAI (N=117)

Dependent Variable	Independent Variable	Path Coefficient*	Explained Variance	Error Variance
Use of Disaster Assistance (Y ₁)	Damage to Dwelling (X ₁)	.01	.04	.96
	Weeks out of Work (X ₂)	.09		
	Education (X ₃)	-.03		
	Income (X ₄)	-.07		
	Age (X ₅)	-.18		
Use of Informal Aid (Y ₂)	Damage to Dwelling	.32*	.16	.84
	Weeks out of Work	.16		
	Education	-.08		
	Income	.08		
	Age	.03		
Use of Insurance (Y ₃)	Damage to Dwelling	.13	.18	.82
	Weeks out of Work	.05		
	Education	.02		
	Income	-.01		
	Age	.40*		
Percent of Losses Covered (Y ₄)	Damage to Dwelling	.03	.06	.94
	Weeks out of Work	-.00		
	Education	.03		
	Income	-.00		
	Age	.24*		
Household Moves (Y ₅)	Damage to Dwelling	.07	.04	.96
	Weeks out of Work	.16		
	Education	-.07		
	Income	-.06		
	Age	-.01		
Perception of Recovery (Y ₆)	Damage to Dwelling	.01	.25	.75
	Weeks out of Work	-.12		
	Education	.02		
	Income	-.04		
	Age	-.06		
	Use of Disaster Assistance	-.04		
	Use of Informal Aid	-.28*		
	Use of Insurance	-.14		
	Percent Losses Covered	.35*		
	Household Moves	-.06		

* Path coefficients significant at the .05 level or better.

TABLE V-24

ESTIMATES OF THE STRUCTURAL PARAMETERS OF THE PATH MODEL
OF FAMILY RECOVERY: FILIPINO ETHNIC GROUP, KAUAI (N=89)

Dependent Variable	Independent Variable	Path Coefficient*	Explained Variance	Error Variance
Use of Disaster Assistance (Y ₁)	Damage to Dwelling (X ₁)	.18	.05	.95
	Weeks out of Work (X ₂)	.05		
	Education (X ₃)	-.13		
	Income (X ₄)	.01		
	Age (X ₅)	-.18		
Use of Informal Aid	Damage to Dwelling	.15	.18	.82
	Weeks out of Work	-.08		
	Education	.49*		
	Income	-.16		
Use of Insurance (Y ₃)	Age	.13*	.24	.76
	Damage to Dwelling	.29*		
	Weeks out of Work	-.17		
	Education	.27*		
	Income	.02		
Percent of Losses Covered (Y ₄)	Age	.42*	.15	.85
	Damage to Dwelling	.29*		
	Weeks out of Work	-.23*		
	Education	.07		
	Income	.05		
Household Moves (Y ₅)	Age	.10	.18	.82
	Damage to Dwelling	.26*		
	Weeks out of Work	.15		
	Education	.15		
	Income	.02		
Perception of Recovery (Y ₆)	Age	-.13	.21	.79
	Damage to Dwelling	-.31*		
	Weeks out of Work	-.10		
	Education	-.10		
	Income	.11		
	Use of Disaster Assistance	-.10		
	Use of Informal Aid	.03		
	Use of Insurance	-.09		
	Percent Losses Covered	.31		
	Household Moves	.02		
		-.02		

* Path coefficients significant at the .05 level or better.

TABLE V-25

ESTIMATES OF THE STRUCTURAL PARAMETERS OF THE PATH MODEL
OF FAMILY RECOVERY: ANGLO GROUP, COALINGA (N=260)

Dependent Variable	Independent Variable	Path Coefficient*	Explained Variance	Error Variance
Use of Disaster Assistance (Y ₁)	Damage to Dwellings (X ₁)	.05	.05	.95
	Weeks out of Work (X ₂) ¹	.06		
	Education (X ₃)	-.03		
	Income (X ₄)	-.20*		
	Age (X ₅)	-.06		
Use of Informal Aid (Y ₂)	Damage to Dwelling	-.03	.03	.97
	Weeks out of Work	.08		
	Education	-.09		
	Income	-.08		
Use of Insurance (Y ₃)	Age	.06	.08	.92
	Damage to Dwelling	.11		
	Weeks out of Work	-.08		
	Education	.14*		
Percent of Losses Covered (Y ₄)	Income	.21*	.04	.96
	Age	.07		
	Damage to Dwelling	.12*		
	Weeks out of Work	-.13*		
Household Moves (Y ₅)	Education	.09	.05	.95
	Income	.03		
	Age	-.07		
	Damage to Dwelling	.16*		
	Weeks out of Work	.01		
Perception of Recovery (Y ₆)	Education	.13*	.19	.81
	Income	-.06		
	Age	-.08		
	Damage to Dwelling	-.09		
	Weeks out of Work	-.02		
	Education	.02		
	Income	.01		
	Use of Disaster Assistance	-.08		
	Use of Informal Aid	-.16*		
	Use of Insurance	-.09		
	Percent Losses Covered	.41*		
	Household Moves	-.08		

* Path coefficients significant at the .05 level or better.

TABLE V-26

ESTIMATES OF THE STRUCTURAL PARAMETERS OF THE PATH MODEL
OF FAMILY RECOVERY: HISPANIC GROUP, COALINGA (N=166)

Dependent Variable	Independent Variable	Path Coefficient*	Explained Variance	Error Variance
Use of Disaster Assistance (Y ₁)	Damage to Dwelling (X ₁)	.12	.10	.90
	Weeks out of Work (X ₂)	.16		
	Education (X ₃)	-.21		
	Income (X ₄)	.04		
	Age	.07		
Use of Informal Aid (Y ₂)	Damage to Dwelling	.18	.06	.94
	Weeks out of Work	-.01		
	Education	.11		
	Income	-.04		
Use of Insurance (Y ₃)	Age	-.06	.05	.95
	Damage to Dwelling	-.07		
	Weeks out of Work	-.06		
	Education	-.05		
Percent of Losses Covered (Y ₄)	Income	.18	.11	.89
	Age	.11		
	Damage to Dwelling	-.31*		
	Weeks out of Work	-.09		
	Education	-.14		
Household Moves (Y ₅)	Income	-.04	.10	.90
	Age	-.09		
	Damage to Dwelling	.23*		
	Weeks out of Work	.07		
	Education	-.14		
Perception of Recovery (Y ₆)	Income	-.02	.25	.75
	Age	-.16		
	Damage to Dwelling	.13		
	Weeks out of Work	.24*		
	Education	.05		
	Income	.10		
	Age	-.18		
	Use of Disaster Assistance	-.17		
	Use of Informal Aid	.03		
	Use of Insurance	.08		
	Percent Losses Covered	.27*		
	Household Moves	-.29*		

* Path coefficients significant at the .05 level or better.

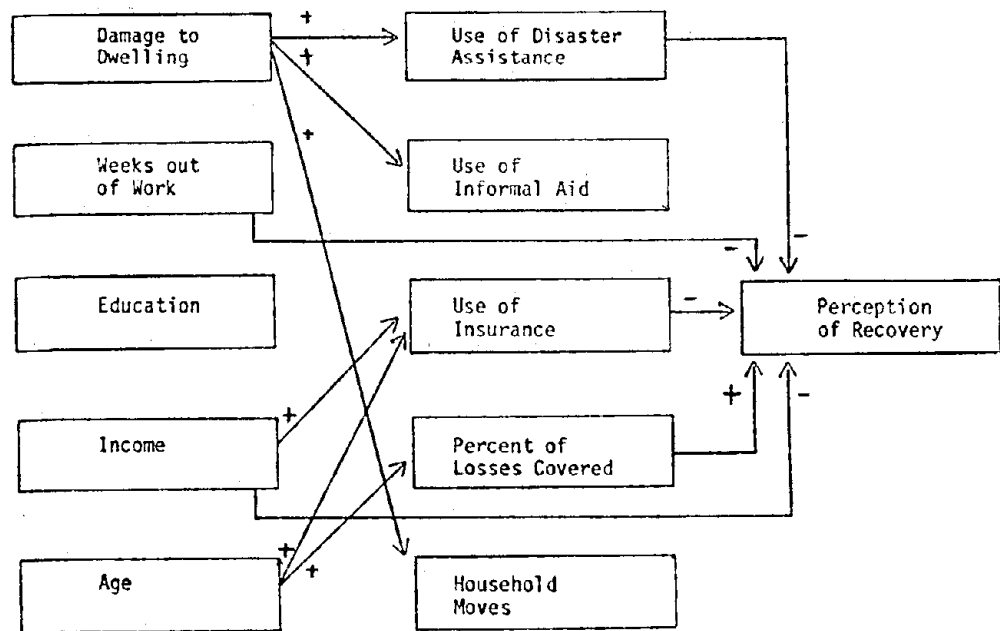
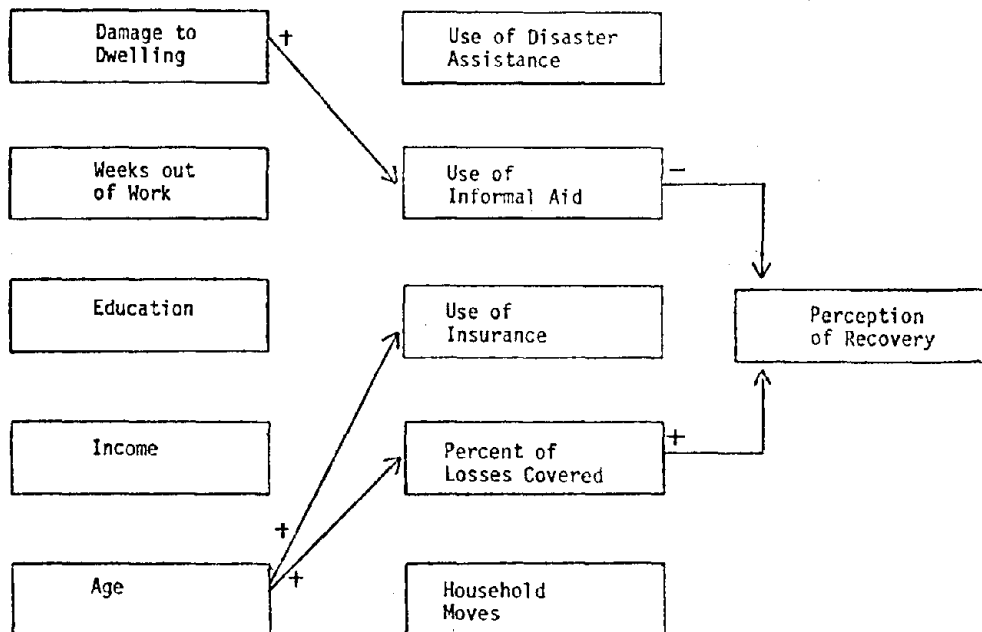


FIGURE V-2

RELATIONSHIPS IN THE PATH MODEL SUPPORTED BY THE DATA,
CAUCASIAN GROUP, KAUAI



FIGUREV-3
RELATIONSHIPS IN THE PATH MODEL SUPPORTED BY THE DATA,
JAPANESE GROUP, KAUAI

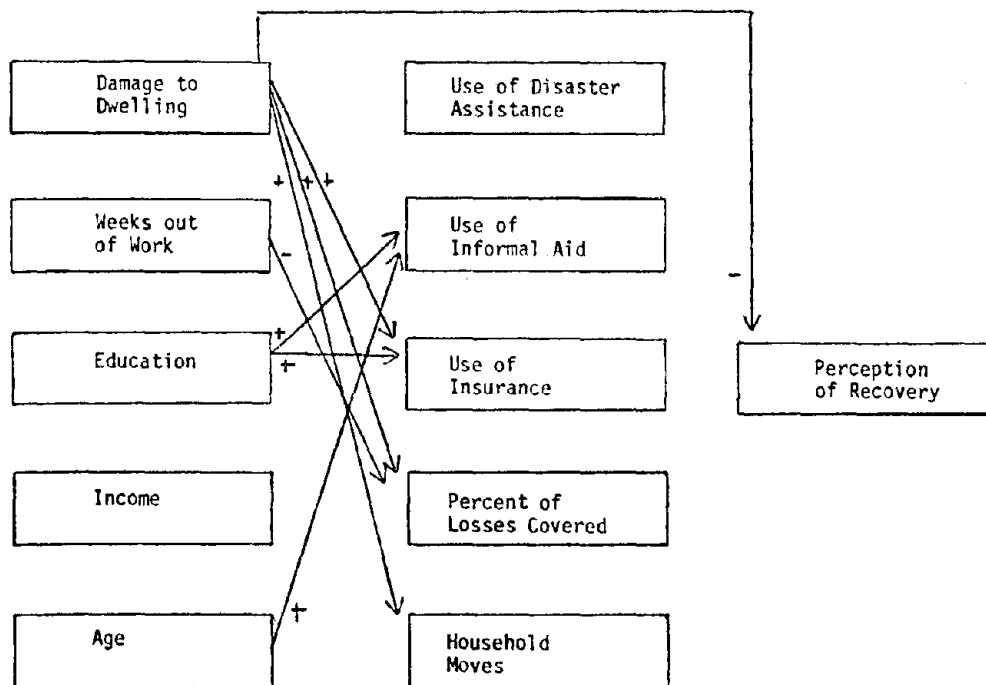


FIGURE V-4
 RELATIONSHIPS IN THE PATH MODEL SUPPORTED BY THE DATA,
 FILIPINO GROUP, KAUAI

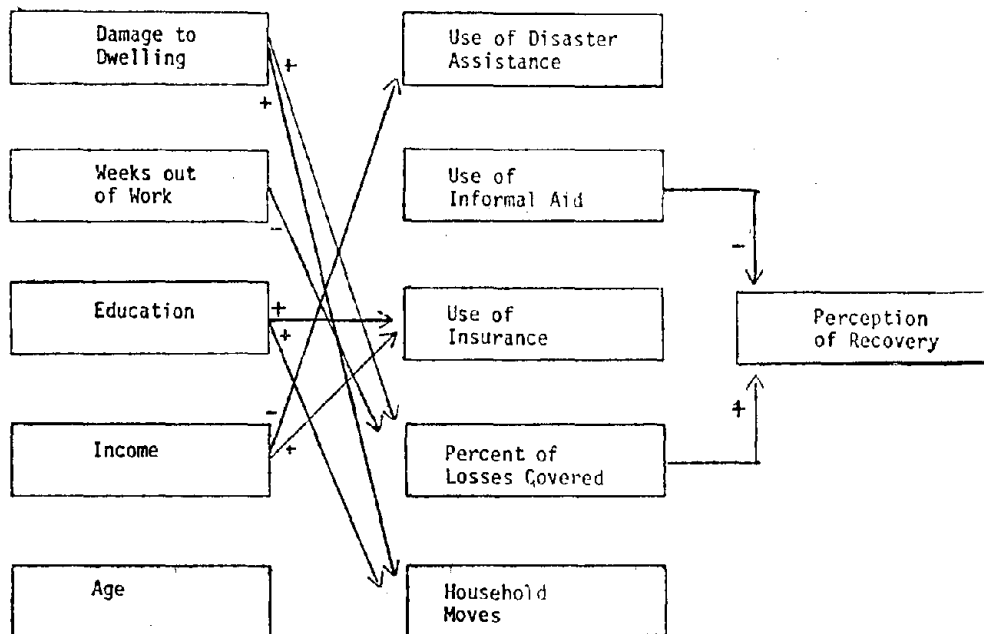


FIGURE V-5

RELATIONSHIPS IN THE PATH MODEL SUPPORTED BY THE DATA,
ANGLO GROUP, COALINGA

RELATIONSHIPS IN THE PATH MODEL SUPPORTED BY THE DATA,
HISPANIC GROUP, COALINGA

found for the Japanese group (Table V-23) and the Anglo group (Table V-26), where 25% of the variance in recovery is explained. No good explanation for the relative "success" of the model across groups can be offered, unless it is the relative greater variability within the Caucasian group with respect to the independent variables under consideration.

In order to bring into relief the most important "paths" to recovery found in the various groups, those with significant path coefficients have been plotted on a diagram of the model. These have been prepared for each of the groups, as follows: Caucasian, Kauai (Figure V-2); Japanese, Kauai (Figure V-3); Filipino, Kauai (Figure V-4); Anglo, Coalinga (V-5); and Hispanic, Coalinga (Figure V-5). A few general observations will be ventured, based on these comparisons.

For all groups but the Filipinos, the level of losses covered by insurance or assistance was of particular importance, compared to other variables, in explaining recovery level. The relationship between income and insurance is positive, whereas the one between income and program use is negative. This suggests that those few who did receive insurance payments were less likely to make extensive use of the disaster assistance programs (and would have been ineligible for some types of assistance). For the Filipino group, the percent coverage of losses was not a significant variable in explaining level of recovery. Even though the level of damage for the Filipino households was positively and significantly related to the level of loss coverage, coverage of losses does not contribute significantly to the explanation of level of recovery. Only level of damage in a direct path is found to be of relatively greater importance to recovery level than other variables in the model. The relationship is negative, as would be expected--that is, the higher the level of damage, the lower the perceived recovery. This implies that for Filipinos, neither disaster assistance nor insurance removed the sting of their losses.

As noted in an earlier section, the Japanese group was found to be very unlikely to have used disaster assistance programs, or even to have gone to the DACs to find out about them. They were the most likely of all the groups to have had insurance and to have applied it to their losses. The level of damage of their dwellings was not found to affect the level of loss coverage, as was apparently the case with respect to

level of coverage from assistance programs for some of the other groups. However, level of damage was important to whether or not the Japanese accepted a high level of help from their primary groups. The negative relationship of high use of informal aid suggests that the Japanese tended either to have and rely on insurance, or to rely on their primary groups. However, the type of aid obtained from primary groups apparently does not strongly affect economic recovery, and the Japanese victims in high damage situations who relied on this type of aid apparently were less likely to consider themselves as recovered.

Many more of the variables in the model contribute to the explanation of recovery for the Caucasian group. As was observed with most other groups, the percent of losses covered was important to the level of recovery they reported (a positive correlation as might be expected). The negative correlation of the use of disaster assistance programs and of insurance suggests that these measures were less than efficacious in dealing with losses. The negative correlation for insurance was probably related to damage to beachfront homes, mainly incurred by this group, for which insurance coverage was disputed. The level of damage sustained by Caucasians on Kauai did not explain the level of loss coverage achieved by the time of the survey, as it had for other groups depending mainly on assistance programs.

Conclusion

These comparisons indicate some differences among the ethnic groups. For the Japanese, who were more likely than others to use insurance, the level of damage was not important to level of coverage. This is most likely a characteristic of insurance users rather than of Japanese, per se. For some reason, assistance received by the Filipinos (note the importance of level of damage in explaining level of coverage of losses) did not contribute to them considering themselves recovered. The other two Kauai groups, the Caucasians and the Japanese, apparently did not pursue the assistance route to its full potential, especially as compared to both of the Coalinga groups.

However, it can be suggested that the more notable differences have to do with the site and the disaster event, rather than separate values. In Coalinga, both the Anglos and the Hispanics appear to have been able

and willing to make use of the potential of the disaster relief programs. On Kauai, only the Filipino group exhibited a strong correlation between level of damage and level of assistance, but level of assistance received did not have a significant effect on perception of recovery. For the Filipino victims, recovery was explained mainly by the direct effect of level of damage: the greater the damage they sustained, the lower their perceived recovery at the time of the interview--regardless of the percent of their losses covered by disaster relief programs or insurance. This could reflect some difference in Filipino perception characteristics, or it might be attributable to measurement error since interviewers had some language difficulties with this group.

Insurance seems to be a relatively important factor in the recovery process for the Caucasians and the Japanese, although that adjustment was more successful for the Japanese. This may be due to the type of damage they sustained, compared to the damage befalling the mainly Caucasian beachfront dwellers--the coverage of which, as noted, was disputed. In an earlier section, it was noted that none of the Kauai groups made the same level of use of disaster assistance programs as did the Coalinga groups, with this being particularly pronounced for the Japanese. This may simply be a reflection of the generally lower levels of damage related to Hurricane Iwa compared to the Coalinga earthquake. However, again, it might also indicate a community or cultural norm on Kauai not to seek assistance from outsiders. A third explanation could be that the formal disaster relief effort was simply not as effective on Kauai, with that island's much more scattered population (compared to the compact small community of Coalinga). Our data do not generally give us reason to believe that to be true, although certainly the scattered and heterogeneous population on Kauai would have been much more difficult to serve than the highly concentrated and somewhat more homogeneous community of Coalinga.

A general observation can be offered on the basis of this analysis: higher levels of recovery were best explained by the level of loss coverage from insurance or assistance. The level of loss coverage obtained was best explained by the level of damage sustained by the household. This seems most true in instances where insurance was not a major factor in a household's recovery process. Where insurance coverage was appro-

priate to the source of damage, the level of coverage did not depend on the level of damage. When disaster assistance programs were the major source of loss coverage, the level obtained seems to have varied with the level of damage--greater coverage being explained by greater damage. It is not clear whether this is a function of the way the program works or of the intensity with which those suffering the greatest losses "work" the disaster relief system.

From the findings of this study, it can be concluded that level of damage is more important than socioeconomic or ethnic or minority group status in explaining the rate of recovery from disasters. However, when the interaction of the disaster agent and the characteristics of the built environment lead to greater levels of damage within ethnic or minority groups, their demographic and cultural characteristics (e.g., income, level of trust in the government) and patterns of adjustment (e.g., purchase of insurance) will then determine their use of assistance and rate of recovery.

CHAPTER VI

THE COALINGA, CALIFORNIA EARTHQUAKE

The monitoring of disasters described in Chapter V yielded another site for study in May of 1983, when an earthquake hit Coalinga, California. Although Coalinga only marginally met some of the criteria for a study site, it was deemed particularly valuable for examination because of the ongoing National Earthquake Hazards Reduction Program and the associated increased national concern for better understanding of, and preparation for, earthquake disasters.

As in Chapter V, the responses discussed here were obtained from disaster victims several months after the earthquake struck. Because the studies are so similar, some additional comparisons of the Kauai and Coalinga disasters are offered in this chapter, and the data for Coalinga are included with the data in Chapter V for Kauai. Information on all the other aspects of the disaster in Coalinga--which was intensively studied by numerous researchers and agencies--is available in various reports, most notably in a comprehensive review of all the research on Coalinga recently published by the California Seismic Safety Commission (Tierney, 1985).

The Disaster and the Community

At 4:42 p.m. on May 2, 1983, an earthquake occurred with a mean Richter magnitude of 6.7 centered ten miles northeast of Coalinga. It was quickly followed by an aftershock with a magnitude of 5.6. The two shocks on May 2nd destroyed most of the central business district of Coalinga and caused major damage to about 50% of all dwellings. The major source of damage was groundshaking.

In recent times, Coalinga has frequently experienced minor seismic activity believed to be associated with the nearby San Andreas Fault. However, it was a less conspicuous, undocumented fault in the Coalinga anticline that produced the May 2nd quake. That event was followed by over 7,200 aftershocks from May 2 to August 1, 1983. Of these, 147 registered magnitudes greater than 3.0, and 28 greater than 4.0. According to Earthquake Engineering Research Institute descriptions, a complex network of faults approximately 40 km long, 15 km wide, and more than

10 km deep is responsible for these continuing aftershocks.

Impacts of the Earthquake

There have not been any previous earthquakes that have caused damage to the town of Coalinga. However, historical analysis of seismicity of the central coastal range indicates that the Coalinga earthquake should not be considered anomalous. In this area an event of this magnitude can be expected every 161 years; a quake of magnitude 6.0, every 55 years. Despite this pattern of seismic activity east of the San Andreas, most residents of the area perceived the threat of earthquake hazards as small.

Because the city is relatively small (approximately one and one-half miles between its farthest points), self-contained, and geologically uniform, damage patterns followed variations in dwelling structure. Nearly all the residences were single-story, wood frame homes, and over two-thirds were at least 20 years old. The most severe damage was to older homes which were improperly anchored to their foundations and lacked adequate lateral bracing. Typically, these houses were thrown off their foundations. For the most part, damage to newer homes was limited to interior furnishings, chimneys, brick veneers, and unanchored porches. Nonstructural damage, such as falling bricks and breaking glass, was one of the most common sources of injury. About 95% of the central downtown business district, made up mainly of older brick buildings, was destroyed.

Damage reports vary from report to report, and across time as estimates are revised. Appendix B, Table 2 presents estimates based on Red Cross reports. These figures may have changed somewhat since they were initially compiled. However, they give an indication of the magnitude of the losses and damage related to the earthquake.

Disaster Assistance

One and one-half hours after the quake hit, the Red Cross established a mass shelter and feeding unit with the aid of the Salvation Army and local churches. Other groups such as the National Guard, the Naval air station, and private companies and utilities were instrumental in providing labor and other services to meet immediate needs.

A Presidential Declaration authorizing federal assistance was made on May 5, 1983. The Coalinga Disaster Assistance Center (DAC) was open

between May 7 and May 25 as a central processing station for disaster assistance information and applications for services. Approximately 2,500 claims were made with federal, state, and local governments and private organizations that were represented at the DACs.

The Community

Coalinga is somewhat isolated from the rest of the state. It is a small city of approximately 6,600 people situated 60 miles southwest of Fresno on the western fringe of the San Joaquin Valley. Developed in the late 1880s as a coaling station for the railroad, since the 1920s it has been sustained by oil pumping operations, agriculture, and education.

Seen from the air, development density is fairly uniform throughout the town, the boundaries of which are fairly discrete. In addition, there are a few smaller towns several miles away and small settlements of agricultural workers clustered around the headquarters of cotton farms and feed lots in the vicinity. One enters the Coast Range foothills just to the west of town, and an interstate highway lies about 13 miles east of the community. On I-5 one can get to San Jose to the north, or Los Angeles to the south in two to three hours. Fresno, the county seat, is about an hour away.

Largely a result of the California Water Project, agriculture in the area, now increasing in importance, has attracted a number of Hispanic farm workers to the Coalinga area. Although Coalinga is relatively homogeneous in its ethnic composition, with over four-fifths of the community consisting of white/Anglo residents, nearly all of the remaining residents are of Hispanic origin (16%). In addition, there are several farms and ranches in the outlying area that employ and provide housing for Hispanic workers and their families. About 13% of the residents speak Spanish within the home.

The bulk of Coalinga's families consist of married couples (87%), and 44% of all married couples have children under the age of 18. For the most part, Coalinga is a middle-income community, with median family income in 1979 dollars just below that of the State of California as a whole (\$20,403 vs. \$21,537). About 7% of the family incomes were below the poverty level; the average for the state is 8.7%.

Despite dwindling oil reserves over the past 15 years, unemployment has remained only slightly above the state average (5.3% vs. 4.1%), and

the standard of living is comparable to that found statewide. Approximately 58% of all residents 25 years or older are in the labor force, with the majority employed in education, retail trade, oil operations, agriculture, and construction (in that order). A lower proportion of the residents than is characteristic for the state are either professional/managerial workers (17% vs. 25%) or technical/sales/clerical workers (24% vs. 33%).

About 64% of Coalinga residents have a high school diploma, relative to 74% of state residents. However, a fairly high proportion have had at least some college, probably due to the presence of a junior college in the community.

A large proportion (84%) of the Coalinga residents live in single-family dwellings; almost two-thirds of the year-round housing units are owner-occupied. In 1980 there was little excess housing in Coalinga; less than 1% of homes owned were vacant, and about 6% of rentals were vacant. Coalinga is a fairly stable community. Over 50% of its residents surveyed in the 1980 census were occupying the same house they had lived in five years previously.

The Study Method

The interview schedule used in Coalinga was virtually the same as that used in Kauai, with the exception of a few changes that made it site-specific. For Coalinga, both English and Spanish versions of the interview schedule were prepared and used. The same field director conducted both the Kauai and Coalinga surveys, and interviewers were recruited and trained on site for both studies. In Coalinga, four of the 16 interviewers used were bilingual and conducted interviews mainly with Hispanic households. They could use either the English or Spanish version of the interview.

Interviewing

The interviewers in Coalinga had valuable local information and experience, as did those in Kauai, and they enjoyed the trust of the local residents. There was a new problem in Coalinga, however, in that many of the residents already had been interviewed by many researchers and were reluctant to participate in yet another survey, regardless of who was conducting it. As had been the case in Kauai, interviews were

conducted in the language most comfortable for the respondent.

Sampling

An enumeration of damaged dwellings consisting of the damage assessment list from the American Red Cross was used. The Red Cross damage estimates were obtained by volunteers canvassing the impact zone immediately following the disaster. Dwelling units were evaluated as sustaining minor, major, total, or no damage, and as being either single- or multifamily. Either an address or a description of the dwelling and its location was provided. For this study, buildings which were described as having no damage were eliminated. Then, to obtain the targeted sample size, 400 households (representing 22% of the affected residents) were selected randomly from the Red Cross list.

Appendix B, Table 3 provides information on the completion rate and reasons for non-completion of interviews with this initial sample. There was a relatively high refusal rate attributed by the interviewers to the large number of other surveys already administered to the residents. Substitute sampling units were randomly selected, but, after making approximately 25 substitutions in this manner, it became clear that an insufficient number of Hispanic households were included in the sample. Since the central intent of the study was to compare ethnic groups, it was decided to compromise the sampling procedure in order to obtain adequate numbers of Hispanics to permit valid analysis. This lower than expected number of Hispanic interviews was due both to there being fewer Hispanic families present in the community than had been anticipated from earlier survey reports, and to the mobility of Hispanic households as a result of the quake. Hispanic families were more apt than Anglo to live in poorly constructed housing, which suffered greater than average damage, and many had moved from their pre-earthquake homes. They were also less likely to be home owners and therefore more mobile than other residents.

Thus, as a means of increasing the number of Hispanic respondents, a disproportionate sample of Hispanic households was drawn in addition to the initial sample. Of the 120 substitutions made from the original sample of respondents who were not interviewed, 80 were allocated to the Hispanic group. Three clusters of Hispanic households were identified, two consisting of neighborhoods within the city, and one consisting of

clusters of farm employees at the ranches and farms around the community which had sustained damage in the earthquake. Nearly all available Hispanic households residing within these areas that had suffered quake damage were interviewed.

Characteristics of the Sample

The Coalinga sample represents mostly persons who live and work in the community; a small proportion live on scattered ranches (cotton farms), and some of the town dwellers work on the ranches or in the oil fields. The mean age of the victim respondents in Coalinga was 42.5 years, with 18% of the sample over the age of 60. There were 3.4 persons per family, and 95% of the victim families resided in single-family dwellings before the disaster; 55% of those owned the dwelling. The mean number of years the victim family had lived in their home was 8.9; the mean number of years in Coalinga was 18.4.

The average predisaster monthly income (after taxes) in the Coalinga victim sample was \$1405, reflecting in part the fairly high salaries of oil workers. Heads of households were predominantly in unskilled and skilled occupations (72.2%), as opposed to management or professional positions (18.4%); 11.4% were retired. Forty-five percent of the household heads had high school diplomas and 14.7% had college degrees. About 12.5% of the heads of household claimed no religious affiliation, 35.1% were Catholic, 42.6% were Protestant, and the remaining 9.8% claimed some other affiliation.

Sample Ethnic Groups

About 70% of the sample classified itself as Anglo, and 30% as Hispanic. Census figures indicate about 16% of the Coalinga population is Hispanic, but the damage patterns suggested that Hispanics would be disproportionately represented in a sample of victims. Because of the extraordinary measures taken to find Hispanic victims, and the possibility that many of the Hispanics present at the time of the earthquake were migrant farm workers who had since moved on, it is difficult to say how representative this distribution is of the damage incurred by the two groups. The Hispanics appear to be mainly Mexican-American or Mexican national, with a few from various other Central and South American countries. No effort was made during the interviews to establish whether or not respondents were citizens of the United States, although there is

evidence indicating that the sample includes some "illegal aliens" mainly from Mexico.

The distinction between the ethnic groups was very discrete. Virtually all the non-Hispanic respondents characterized themselves as belonging in the Anglo category. Three households were mixed, with one spouse being Anglo and one something else (American Indian or Asian). All were placed in the Anglo sample; thus, 31% of the sample was classified as Hispanic and 69% as Anglo. Although there was no significant pattern with respect to age differences in the two ethnic groups of victim respondents, the Hispanic heads of household tended to be somewhat younger than the Anglo heads of household (Appendix B, Table 4).

The Hispanics in the sample were somewhat less likely than the Anglos to have lived in their pre-earthquake dwelling for over five years, while Anglo households were much more likely than the Hispanics to have lived in theirs for over 15 years (Appendix B, Table 5). About 73% of the Anglo group had lived in Coalinga for twenty years or more, compared to 27% of the Hispanic victim group. Hispanic respondent households also were more likely to be renters, with 68% renting or living in employer-provided housing, compared to 34% renters among the Anglo group (Appendix B, Table 6).

The Hispanic victims were less likely than the Anglos to represent one-person households and slightly more likely to live in households with children (Appendix B, Table 7). The larger families were somewhat more likely to be found in the Hispanic group than in the Anglo group (Appendix B, Table 8). The heads of the Hispanic victim households were most likely to be found in the unskilled and laborer categories of occupation, while the Anglos were most likely to be found in the more skilled and professional occupations (Appendix B, Table 9). The Hispanic laborers were most likely to be associated with the agricultural activities, while the Anglos were employed in the commercial activities in Coalinga or with the oil companies. Pre-earthquake unemployment rates were similar for the two groups, although the Hispanics perhaps could be characterized as more underemployed (7.8% worked only part time) (Appendix B, Table 10). Fewer of the victim Hispanics classified themselves as retired--7% compared to 13.5% for the Anglo group.

The two groups of victims clearly differ with respect to their

income level (Appendix B, Table 11). The Hispanic victims were much more likely to be in lower income categories compared to the Anglos, who were likely have a monthly income of over \$1000. The general level of education of the heads of the Hispanic victim households also was lower than for the Anglos (Appendix B, Table 12). Around 32% of the Hispanic heads of household reported having at least a high school education, while almost 80% of the Anglo heads of household had a high school education or more.

Effects of the Disaster

Damage and Loss

The entire community was subject to essentially the same magnitude earthquake, but the damage patterns reflected to a great extent the nature of the construction of each individual building and its placement on the lot. The social distribution of damage and loss generally followed the distribution of housing by social class. High death and injury counts for earthquake events are frequently related to particular kinds of structures--specifically, those with unreinforced masonry walls and/or heavy tile roofs.

For Coalinga, one subsequent death was attributed to the earthquake, and some of the families in the samples reported that one or more family members were injured badly enough to need medical attention. However, most of the older, "pre-code" dwellings were of wood rather than unreinforced masonry and thus less subject to total collapse and less prone to cause injury. The unreinforced masonry buildings present in the community (mostly in the downtown area) typically did not withstand the forces of the earthquake, and the relatively few deaths were fortuitous.

Portions of the community were left undamaged, but, as described above, the study respondents were selected from lists of households that had been destroyed or damaged. As was the case with the Kauai respondents, damage levels for the households varied. Hypotheses employed in this survey were the same as those applied to Kauai.

Of the respondent families, 41.2% reported some damage to their dwellings, and 24% reported that their dwellings were totally destroyed (Appendix B, Table 13). The latter figure is particularly important with respect to postdisaster needs and household disruption (to be discussed

later). The average dollar loss for structural damage was \$12,994, the mean loss to contents was \$2,908, and the average percentage loss to the contents of dwellings was 31%. The total loss of a structure, however, did not necessarily mean the total loss of the contents.

Ethnic Group Comparisons. In Coalinga, the Hispanic group was twice as likely as the Anglo group to have suffered a high level (over 75%) of structural damage (Appendix B, Table 14). Based on field observations of the community, this difference is due to the greater likelihood of this group living in the older and less structurally sound housing in the community.

In examining victim attitudes, a relationship was found between level of damage and sense of being worse off than others (Appendix B, Table 15). In Coalinga, the Hispanics were more likely to see themselves as worse off than others, but not in the numbers one might have been expected in view of the level of loss within this group. One explanation for this might be that when asked to compare themselves to others in the community, they tended to compare themselves to other Hispanics. This would make their comparison group one with similar levels of loss.

Dislocation and Disruption

A major characteristic peculiar to earthquakes can affect post-disaster decisions. It could not be assumed that "the earthquake" was over in Coalinga after the initial damaging jolt. Major aftershocks occurred soon thereafter, causing further damage and creating concern among the inhabitants of the community about the safety of returning to their dwellings. Noticeable tremors continued throughout the months following the disaster and are expected to continue for several years.

Household Dislocation. Families in Coalinga were likely to have left their home, with 75% reporting being out at least one night. It is probable that the high dislocation rate in Coalinga is related to the frequent and severe aftershocks which convinced many families that it was prudent to remain outside their homes, even if the structure was essentially habitable.

More than half the Coalinga families who moved out of their homes reported camping in their own yard after the earthquake (Appendix B, Table 16). This is probably related more to the uncertainty about being inside than to not having other places to go, although there was in-

adequate housing available for the displaced. In addition, the pleasant weather in Coalinga at that time permitted people to stay outdoors in tents or in cars if they desired. The adjustment would probably have been different had the weather been inclement. Thus, a better understanding of the interaction between type of disaster and weather conditions and the resultant effect on where families decide to stay immediately after a disaster (i.e., in the yard, inside damaged homes, or in shelters and others' homes) is clearly important for disaster relief planning.

The provision of housing for disaster victims in areas where housing supply is tight (due to disaster damage or predisaster patterns) creates fairly complicated logistical problems for the providers of disaster relief. In Coalinga, where housing alternatives were virtually nonexistent after the earthquake, FEMA mobile homes were used. In another site we studied--Alviso, California--most flood victims were initially housed in motels in unflooded areas. Each solution created different kinds of dissatisfaction for the dislocated families. These will be discussed later.

Similar percentages of those persons who were dislocated in both Coalinga and Kauai moved in with relatives following the disaster (Appendix B, Table 16). In Coalinga, these relatives might well have lived outside of town and therefore be considered a reasonable alternative to staying in the earthquake zone. As mentioned, over 50% of the victim families devised some means to stay near but outside their homes, and only a few moved in with neighbors or friends. As is typically found in instances where housing alternatives exist, few in either site selected an official shelter as a first destination, although utilization of such shelter was much more likely on Kauai than in Coalinga. Of course, there are no figures for those whose first or perhaps second disaster-related move was to leave town for good, since they are not included in the samples.

Household Disruption. Due to the differing natures of the disaster events and their impacts, the families in Coalinga were more likely to have been dislocated temporarily from their damaged homes, while the families in Kauai were more likely to have lived in their homes while they were under repair. Some families in Coalinga suffered both types of

disruption.

Although 73% of the Coalinga victim sample were back to their pre-disaster address by the time these interviews were conducted (seven to eight months after the disaster), 75% of the Coalinga households had left their homes, at least temporarily, following the disaster event (Appendix B, Table 17). Respondents for households which had been dislocated from their homes were asked how disruptive the moves had been; having to leave one's home was reported to be very disruptive by 56% of the sample. That 29% of the Coalingans indicated they intended to move again in the near future may be a reflection of the great number who had not returned to their predisaster location or who were still living in FEMA-provided housing at the time of the interview. The intent of most victims was to find a more suitable dwelling in the community; few voiced the intention of leaving the area.

About 49% of the sample reported that they had made repairs to their dwellings while living in them after the disaster, and 40% said that living in a house under repair was highly disruptive.

Employment Disruption. Since the earthquake caused damage to commercial and industrial property, some people were laid off from their jobs. Twenty-seven percent of the heads of household had their workplaces closed--an average of 3.3 weeks (Appendix B, Table 18). However, only 3% of the sample reported that they were out of work for over one month. Although being out of work can be economically and emotionally difficult, it does not seem to have caused great hardship to very many families in this sample.

Ethnic Group Comparisons. Both Anglos and Hispanics were apt to have been dislocated from their homes and to have moved twice, but Hispanics were more likely than Anglos to have moved more than twice (Appendix B, Table 19). The two-move sequence typically involved living for a time in emergency housing and then moving back into one's predisaster dwelling. Moving more than twice seems to have been occasioned by difficulty in finding suitable housing for permanent resettlement. That this was frequently the case with Hispanics is attributable to three interrelated circumstances: Hispanics lived in the oldest and most damaged housing; they generally rented; and the type of housing they occupied was either unlikely to be repaired or, if it was fixed up, it

was likely to be priced out of the market it once occupied.

Anglos were more adversely affected by damage to their work places than were Hispanics, largely because Anglos worked in the heavily damaged downtown section of Coalinga and most Hispanics were agricultural workers.

Psychological Distress

The measures of psychological distress included in the study were designed to reveal some of the consequences of loss, disruption, and dislocation, and to indicate levels of emotional recovery among the victim families. In response to the query about their general health, 72.6% of the sample said it was excellent or good, but 19% said that it had worsened since the disaster. About 80% of the complaints were felt to be related to disaster effects.

There were some reports of increased smoking, drinking, or taking of medications following the disaster. These increases may be related to the extent of damage and destruction which Coalingans had to face, or to the long-term disruptions they had to cope with. An attempt was made to determine whether the continuing aftershocks of the quake caused stress: 80% of the respondents said that, indeed, they were disturbed by the tremors.

Sixty-four percent of the households had one or more members dealing with emotional problems, but in only 28% of the households was professional help sought (Appendix B, Table 20). Hispanics sought counseling more often than Anglos, but it is difficult to determine whether this was because they had more damage and disruption, or because there was a concerted effort made by a regional mental health team to reach the Spanish-speaking population (Appendix B, Table 21).

Use of Formal Disaster Assistance Programs

The Presidential Disaster Declaration made recovery and reconstruction funds available under the Disaster Relief Act and established a Disaster Assistance Center (DAC) in Coalinga. The Red Cross also set up a mass feeding facility in conjunction with the DAC.

Use of DACs and Funds

Of the respondents interviewed, 81.4% reported that they had gone to the Disaster Assistance Center, with 46% saying they had gone more than

twice (Table V-1; data for Coalinga are included with the data for Kauai presented in the previous chapter). This high usage and return rate (particularly in relation to Kauai) could be because food and other commodities were available at the DAC and/or because the people had a great need for help. Seventy-two percent of the respondents said they received some type of assistance from one of the formal programs, with 79% of them getting aid from the Red Cross, 76% using food stamps, 67% benefitting from a Salvation Army program, 32% seeking shelter through the FEMA Temporary Housing Program, and 20% applying for Individual Family Grants (Table V-2).

There was higher use of federal programs in Coalinga than in Kauai, perhaps reflecting a programmatic use difference that exists in normal times, the greater need for temporary housing in Coalinga, or the greater need for the "last resort" funds provided by IFGs for victims not covered by other programs or by insurance. Over 25% of the sample in Coalinga reported using three or four major relief programs (Table V-3). As in all the other study sites, there was a high positive correlation between number of programs used and damage to dwelling place.

When they were asked to judge the importance of aid programs to their own family's recovery (Table V-4), 67% of the respondents said they were helped in their economic recovery, and 71% said their emotional well-being was aided by the programs. About 90% of the people who had used some program said they were satisfied with it.

Awareness of Assistance Programs

Various means were used to advertise the existence of aid programs (Table V-5). Our survey did not attempt to determine in great detail the specifics of different publicity programs, but we did ascertain how respondents found out about the programs they used. Only 6% of the Coalinga respondents said they learned about aid programs through mail literature, 15% mentioned fliers and handbills, 18% cited a newspaper as their source of information, and 27% named TV or radio. By far the most frequently noted source of information was word of mouth; 83% of the respondents said much of their information came that way.

Ethnic Group Comparisons

As mentioned above, Hispanics were significantly more likely than Anglos to have made multiple visits to a DAC (Table V-6). This is con-

sistent with their higher damage and loss levels. Hispanics were also more likely to have used some local, state, or federal disaster assistance program (85% compared to 66%), no doubt because of their greater losses, more frequent displacement, and lack of resources. It is apparent, at least in Coalinga, that aid programs were used most by those who needed most.

Hispanics were also the more frequent users of Red Cross, Salvation Army, food stamp, and temporary housing programs; and they were much more likely to use multiple sources of aid (Tables V-7 and V-8). However, Hispanics reported the programs as only slightly more important to their recovery than did Anglos. A significant difference between ethnic groups, and one that should be noted by all providers of aid, is the way each got its information: common modes of public communication were far less effective for Hispanics than was word of mouth (Table V-9).

Alternative Adjustments to Losses

Respondents were queried about sources of help available to them other than the formal aid programs discussed so far. Three avenues of recourse were specifically examined: insurance, other personal resources, and aid from relatives and friends. Each one needs to be understood in order to form a complete picture of how victims recover from disasters.

Insurance

Only 9% of the households in the Coalinga sample reported having earthquake insurance, 46% had no coverage at all, and 18% had some kind of insurance but received no compensation. Traditional insurance coverage applied to some of the kinds of damage, and, in some instances, structural damage was ruled to be covered even for those without specific earthquake coverage. For the Coalinga households that did receive some compensation, the average proportion of loss covered was 40% (Table V-10). At the time of the survey (seven to eight months after the disaster), 20% of the respondents indicated that their insurance claims had not yet been settled. Households were highly unlikely to have recouped over 75% of their total losses through assistance and insurance combined (Table V-11). At least 36% of the sample reported continuing money problems in their efforts to replace lost property.

Personal Resources

Although 18% of the households recouped 100% of their losses through a combination of insurance and disaster assistance, most had losses that were not covered by any other provisions. At least 80% of the households had to fall back on some other strategies to fill in gaps, among them: not replacing some things they had lost (64% of the sample), restructuring the household budget to provide for necessities (17%), using savings to cover expenses (42%), borrowing money from disaster loan programs (31%), or borrowing money from friends and relatives (10%) (Table V-12).

Aid from Friends and Relatives

Although relatives were the most important informal source of aid during disaster recovery in Coalinga, neighbors and friends also played an important role in providing aid to households in need (Table V-15). Respondents in Coalinga were much more likely than those in Kauai to indicate that they had no close relatives, friends, or neighbors from whom to get help. However, 70% of those interviewed said they had at least one close friend or relative in town, so there was great potential for social support. In fact, 80% of the sample in Coalinga reported having received aid from relatives, friends, or neighbors.

Respondents were shown a list of aid types typically received from relatives and friends, and they were asked to indicate what kinds of support they had gotten. Categories of help included: household items, advice, moral support, labor, transportation, shelter, food, clothing, or money. In Coalinga, relatives tended to provide shelter, and they, as well as people close to the victim families, both gave moral support (Table V-16). Both of these findings are consistent with the fact that people were dislocated in Coalinga and needed both shelter and moral support for that reason.

Aid from friends and relatives was viewed by at least 50% of the respondents as having been very important, especially for emotional recovery (Table V-17).

Ethnic Group Comparison

Hispanics were found to be much less likely than Anglos to have household insurance of any kind, due in large part to their lower income levels (Table V-13). As was noted earlier, over 50% of the Hispanic

families had a monthly income of \$800 or less, compared to 17% of the Anglos. This lack of insurance was, to a great extent, made up for by the disaster assistance programs. Table V-13 indicates very little difference between the Hispanics and Anglos with respect to the percentage of their total losses covered when insurance and disaster assistance are considered together.

As far as personal strategies for coping with losses, Hispanics were more likely than Anglos to change budget priorities and go without special items in order to afford necessities; Anglos were more likely to decide against replacing certain lost items (Table V-14).

Anglos were considerably more likely to have received informal aid from more than one source, that is, help came from relatives, friends, and neighbors (Tables V-18, V-19). There are two possible explanations for this: 1) the friends and neighbors of the Hispanics were frequently as bad off as they were, and 2) Hispanics in general interact more with their relatives than with other groups. For both ethnic groups, relatives were the biggest source of help.

Overall Recovery

Eight months after the disaster, when the interviews took place, respondents had had sufficient time to adjust somewhat to their post-disaster situation, but very few had recovered completely from economic and emotional setbacks. When respondents were asked to rate their overall recovery, then, they provided clues to the factors that affected the rate and success of their economic and emotional recovery.

Group Recovery Levels

Eight months after the disaster, 32% of the victim families rated themselves as completely recovered economically, and 35% said they were emotionally back to normal (Table V-20). The relative slowness of recovery compared to Kauai may very well be due to the nature of earthquake damage and its aftereffects. The damage in Coalinga was more severe; not only was damage everywhere easily seen by all the community residents, but reminders of the devastation persisted. There were empty lots in the downtown area where familiar businesses had once been, and vacated houses in residential districts stood as silent, disturbing testimony to the losses Coalinga had suffered. In addition, there were recurring after-

shocks for a number of weeks. These recurring reminders in Coalinga may account for the fact that on Kauai emotional recovery far outpaced economic recovery whereas in Coalinga, the two progressed at about the same rate. Community economics could have also played a role: the Coalinga economy had not been particularly robust prior to the disaster, making community redevelopment following the disaster questionable to some.

The levels of economic and emotional recovery in Coalinga reflect the varying rates of damage sustained by the different ethnic groups, with higher levels of both sorts of recovery reported by Anglos. As noted earlier, the Hispanics were notably more likely than the Anglos to have suffered losses of 100%, while the Anglos typically suffered a loss of 25% or less, or--put another way--40% of the Hispanics compared with 20% of the Anglos suffered damage to over 75% of their residence and personal property. As mentioned, Hispanics were more likely to make use of several disaster assistance programs. Indeed, there is much evidence that higher damage level is related to greater use of assistance programs (as well as to low levels of recovery).

As mentioned in Chapter V, differences in ethnic group recovery could be due to the differential application of assistance and aid, or--more likely in Coalinga--to the socioeconomic factors that come into play when ethnic minorities must deal with the financial difficulties and complex institutional arrangements associated with a disaster. Since this study was based on self-evaluation by the victims, some of the differences may be due to the various ethnic groups' different views of their pre- and postdisaster situations.

Explaining Economic Recovery

Our model of the hypothesized relationship of the central variables was thoroughly described in Chapter V. However, some of its implications for Coalinga should be reviewed here. For both the Hispanics and Anglos in Coalinga, it is likely that disaster assistance programs--not insurance--accounted for most of the loss coverage, although some Coalinga victims did have at least partial insurance coverage. In the Anglo group, both insurance use and high use of assistance programs are influenced by income. The relationship between income and insurance is positive; that between income and program use is negative. This suggests

that those few who did receive insurance payments were less likely to make extensive use of the disaster assistance programs (and would have been ineligible for some types of assistance).

Again, for both the Anglos and the Hispanics, level of damage to the dwelling was significant in explaining the level of losses covered. In fact, the relationship was found to be a positive one--the higher the damage levels, the higher the eventual percent coverage of losses. This might indicate that--at least in disasters similar to the Coalinga earthquake--disaster assistance programs work the best for persons with the greatest damage.

Conclusion

This analysis indicates some differences in recovery between the ethnic groups in Coalinga, as well as differences between recovery on Kauai and recovery in Coalinga (discussed in detail in the conclusion to Chapter V). Also, importantly, it shows a strong positive relationship between level of damage and losses covered by disaster assistance programs. This relationship might reflect the extent to which persons with high levels of damage continued to pursue the system to its fullest, while others, with manageable levels of loss, gave up that endeavor. (Thus, in the Anglo group, there was a negative and significant relationship between income and the number of disaster assistance programs used). An alternate explanation--that disaster assistance programs attend in a more effective way to the needs of those with high losses--perhaps warrants further study.

CHAPTER VII

SUMMARY AND CONCLUSIONS

This report has considered a voluminous amount of data across a range of disaster sites and victim characteristics. The following is a summary of findings, comparing results from the various sites, and a discussion of the conclusions and policy implications that might be derived.

Summary

The data for this study resulted from four different disaster agents (earthquake, tornado, hurricane, and floods) affecting two small towns, a developed urban area, and a somewhat dispersed set of rural villages and residences. Coalinga and Paris were rural communities of similar population where a disaster significantly damaged residential areas. The Utah disaster affected an urban strip along the front of a mountain range, and damage was restricted to areas along streambeds and adjacent mountain slopes. The disaster on Kauai was more widespread and damaged parts of the entire island.

At each site, different racial, ethnic, and religious groups were involved. The Coalinga sample consisted of about 70% Anglo and 30% Hispanic victims. The Paris disaster had almost equal numbers of black and white victims. For both of these sites, the victims belonging to racial minorities were also of significantly lower socioeconomic status. The Kauai sample included victims from several ethnic groups; the three sufficiently large to permit multivariate analyses were Caucasian (40%), Japanese (34%), and Filipino (26%). Unlike the samples at the first two sites, the Hawaiian victims showed no marked income differences among groups. The Utah victims were predominantly Mormons, members of a fairly distinct subculture. They were all white, essentially middle-income suburbanites. Each site, except Utah, permitted a comparison of disaster response and recovery among ethnic groups.

The distribution of disaster impacts among victims at each site was related primarily to disaster agent characteristics, topography, and residential location, and secondarily to the sort of housing each of the groups tended to live in. On Kauai, damage was related to topography

since, as in most hurricanes, damage was most severe to beachfront properties. Most such properties were likely to be owned by Caucasians. Damages to dwellings away from the ocean front were related in part to how the topographic features of the island affected wind patterns and intensity levels, and in part to the structural characteristics of the dwellings (those characteristics themselves being a reflection of the socioeconomic status of the occupants). Structural characteristics of housing were also a prime determinant of damage in Coalinga: newer, more solid homes were less likely to be damaged, irrespective of location; however, as in Kauai, structural soundness was related to the socioeconomic status of the residents. In Utah, damage was directly linked to location: homes at the mouths of canyons and near runoff channels sustained the most damage, and the actual area of impact was quite limited. In Paris, damage was a function of both residential location and type. Tornadoes are notoriously capricious in the damage they do, and it was not unusual in Paris to see a house completely destroyed while another 100 feet away sustained only a few broken windows. Housing type did affect damage levels: fragile wood-frame homes suffered greater damage (other things being equal) than brick homes. This study found quite clearly that disaster agent characteristics, as well as damage levels, are important in understanding response patterns of victims.

Damage levels were directly related to ethnicity for two reasons: 1) residential patterns tend to be determined by ethnicity (segregation) and 2) different ethnic groups frequently live in differing sorts of houses. Housing type relates to ethnicity because types of construction and location are determined by costs and the ability to pay (which, as already noted, is closely correlated with race/ethnicity). Thus, on Kauai, Caucasians incurred the highest damages because of their preference for, and ability to purchase, beachfront housing. In Coalinga, Hispanics reported higher damage levels, because they were more likely to reside in older, less structurally sound homes. However, in Utah, losses were not directly related to class or ethnicity, but simply to home location. The situation in Paris was analogous to that in Coalinga--blacks were more likely to live in older, poorly built homes. Consequently, compared to whites, they reported higher levels of physical damage but lower dollar losses.

A number of differences regarding residential dislocation were observed both between and within sites. For example, dislocation was much more likely in Coalinga and Paris than on Kauai. In part, this was due to the greater damage levels at those two sites, and, in Coalinga, it was also attributable to the nature of that town's disaster. Many "dislocated" families stayed outside their own homes for one or more nights, often camping in their yards, because of the threat posed by aftershocks. On Kauai, families who found it necessary or desirable to find alternative shelter after the hurricane were most likely to stay initially with relatives. In both Coalinga and Kauai, the longest stays in temporary housing and the greatest number of postdisaster residential changes were related to levels of damage. However, families on Kauai were more likely than those at the other sites to stay in or move back to homes in need of repair instead of staying in temporary shelter.

The pattern of residential dislocation and postdisaster moves was somewhat different in Paris. There, blacks were more likely than whites to have sought temporary emergency shelter, but whites tended to make more postdisaster moves. While the pattern, to an extent, was damage-related (i.e., people whose homes were destroyed tended to live elsewhere), it was quite clearly related to class and race as well. The pattern reflects one of the prerogatives of class--the ability to seek out optimal temporary housing while a home is being rebuilt. While previous research has indicated that blacks have stronger kin networks than whites, in Paris there was no difference between the two groups in obtaining temporary shelter from kin. Perhaps the most striking difference between the two groups (one also illustrating the perquisites of race and class) was that the overwhelming majority of victims living in FEMA trailers were black. Such trailers are rarely considered desirable by victims (e.g., Bolin, 1982), and the fact that few whites resided in them probably reflects the options available to those with a higher socioeconomic status.

Both blacks and whites in Paris suffered emotional strains from the effects of postdisaster moves and inadequate temporary housing, but blacks were more likely to report high levels of stress. Data from both Kauai and Coalinga also indicated that postdisaster moves create emotional disruptions and stress. At both those sites, and in Utah as well,

living in a damaged home was also reported to cause problems; however, those displaced in Coalinga generally reported higher levels of emotional strain than those living in damaged homes on Kauai. In Utah, the protracted nature of the flooding added to the uncertainties and stresses associated with living in a damaged home. Similarly, in Coalinga, the continued aftershocks caused stress and acted as a recurrent reminder of the earthquake.

Because of the stress, as well as the greater levels of damage and the higher level of residential dislocation, more Coalinga families than Kauai families reported emotional strain. Again, there were few differences in levels of reported emotional strain among the three ethnic groups on Kauai. However, in Coalinga, Anglos were significantly more likely than Hispanics to report such strain--a fact consistent with other mental health literature. The Paris data showed that blacks reported slightly more psychosocial disruption than whites, but differences were not large.

Variances among ethnic groups became more clear when looking at patterns of utilization of formal aid at the various sites. While the timing and types of assistance were similar at all four sites (with the notable exception of the Mormon Church at the Utah site), there were distinct differences among the various groups of victims in their use of these programs. For example, Coalinga victims were much more likely to go to DACs than were Kauai victims, and the same may be said for Paris victims versus Utah victims. In Coalinga, almost three-fourths of the victim households reported that they actually received assistance from at least one program. However, on Kauai, less than half of the respondents used any of the programs. There, it was the Red Cross and the Salvation Army that were most likely to be used, because they offered virtually immediate assistance.

In Paris, housing programs from FEMA were used relatively frequently, more often by blacks than whites; among whites, younger victims were more likely to use FEMA than were older victims. However, white victims were twice as likely as blacks to receive SBA reconstruction loans--reflecting, at least in part, the poorer blacks' inability to qualify for such financing. On the other hand, the lower incomes of blacks made them more likely to receive IFG monies (IFG being a program of "last

resort"), but whites generally received larger cash grants from IFG. Blacks also utilized Interfaith Disaster Services and other local charitable organizations more often than whites. The greater likelihood of blacks to use multiple aid sources reflects both their inability to receive adequate support from fewer sources and their poorer insurance coverage. Utah victims, Mormon or not, tended most often to use aid from the Mormon Church, sometimes to the exclusion of aid from federal, state, and private disaster organizations (such as the Red Cross). In some instances, Utah victims did utilize SBA loans to rebuild homes, but the Mormon Church disaster effort overshadowed other programs.

At all sites, the use of multiple aid programs typically was found to be associated with higher levels of damage and loss, although the pattern was more distinct in Paris and Coalinga than Kauai or Utah. On Kauai, Japanese were the ethnic group least likely to use any assistance program or even to visit a DAC. In a sense, their behavior was comparable to that of Mormons in Utah: their attitude toward and use of aid probably reflects a cultural ethic analogous to the Mormon doctrine of self-reliance. In Coalinga, Anglos were less likely than Hispanics to have used multiple programs of assistance (paralleling the situation in Paris), but the pattern may be explained by both differences in damage levels and the already mentioned differences in resources available to each group.

Victims at all sites and across all ethnic groups reported that the aid they received was important in their recovery. Approval rates were somewhat lower in Paris than other sites, and blacks there were most likely of all groups to consider the aid they received inadequate.

There are some important differences between sites that are associated with the nature of the disaster agent and its impact. Only 9% of the Coalinga victims reported having earthquake insurance--reflecting the relative scarcity and expense of such coverage. Similarly, virtually no one interviewed in Utah had flood insurance. On Kauai, 88% of the victims reported having coverage for wind damage, and they had far better coverage by insurance of any kind than did Coalinga respondents.

In Paris, blacks and whites utilized insurance at essentially equal rates, although somewhat below the level of Kauai respondents. However, blacks were less likely to report having adequate coverage. Still, most

victims in both racial groups felt that the settlements they received from their insurers were fair. Not surprisingly, whites were more likely to have additional living expense coverage to pay for temporary housing. This explains, in part, both their lower utilization of FEMA housing and the fact that insurance coverage was associated with the economic recovery of whites but it was not for blacks.

The possession of insurance was directly related to ethnicity and socioeconomic status, with victims of higher status having more adequate coverage. In general, the distribution of aid at all sites demonstrated that assistance is typically added to insurance coverage to reduce discrepancies between losses and reimbursements. A common strategy across groups for adapting to losses not covered by insurance or aid programs was simply not to replace certain items. Victims who had personal savings (typically middle and upper class) utilized them rather than loans or grants.

At all sites, victims often utilized the help and support of kin, neighbors, and/or friends. On Kauai, the receipt of such aid was clearly related to levels of household damage, with higher loss victims being more likely to receive help from kin or friends. The same pattern held in Paris for both racial groups, but not in Coalinga. There, informal aid was received by a broad range of victims and was not specifically related to high damage levels. As a source of aid, relatives were more important in Coalinga than on Kauai, although aid from friends and neighbors was similar for the two sites.

Because of the greater importance for Hispanics of extended family, in Coalinga they were more likely than Anglos to have received assistance from relatives. The white groups in Paris, Coalinga, and Kauai were more likely to have received aid from more than one of the three primary groups (kin, neighbors, friends) than were the minority groups.

At all sites, the role of kin in providing moral support and emotional comfort was quite obvious, and at sites where there were relatively high rates of residential dislocation (i.e., Paris and Coalinga), the role of relatives in providing shelter and food, especially during the emergency period, was also particularly evident. In all cases, aid received from informal sources was generally viewed by recipients as more important for emotional rather than economic recovery.

When data were gathered eight months after the respective disasters, levels of household recovery varied among sites as well as among ethnic groups within each site. Recovery was most rapid on Kauai. There, residents were considerably more likely than victims at the other sites to report high levels of emotional recovery. This differential recovery rate was probably related to the greater damage levels at the other sites and, in the case of Coalinga, to the long-term effects of the damage to houses and to continuing aftershocks.

Within the Kauai and Coalinga samples, the ethnic groups that had suffered the highest levels of damage also reported the lowest levels of economic recovery (Caucasians and Hispanics, respectively). Similarly, in Paris, a smaller proportion of blacks than whites were recovered; however, that differential rate was due mostly to the differing socio-economic status of the two groups. Family size in Paris proved to be important in recovery with, as might be suspected, small families of both racial groups recovering economically more quickly than larger ones.

The high use of assistance programs by those with greater damage may be related to those victims' needs to use the full range of programs to mitigate their losses. This need was obviated by sound insurance coverage. Still, many of those victims who readily used assistance had not achieved recovery by the time of these interviews. Therefore, it should not be surprising that, in spite of the available aid, many victims--especially those belonging to ethnic minorities and those of lower socio-economic status--reported that assistance was inadequate to meet their needs.

Conclusions

This report is a first attempt to examine the influence of race and ethnicity on family recovery from disaster. Of course, concern with race and ethnicity is essentially concern with culture and traditions, but cultural variations are not due solely to differences in race or ethnicity--class is a determinant as well. Social classes have distinctive values, traditions, attitudes, and ways of behaving just as do racial, ethnic, and religious groups. Therefore, in a sense, this study attempts to assess the effects on disaster response and recovery of cultural variation that is itself a complex interplay of both class and ethnicity.

Indeed, it has been impossible not to refer to certain class factors in comparing the various ethnic groups. Class factors certainly figured strongly in the Paris data, where victims of lower socioeconomic status simply did not recover as quickly as did those of higher socioeconomic status, irrespective of race. However, data from that site also disclosed certain recovery strategies that could not be attributed directly to class. Thus, disaster response and recovery behavior is determined by a dynamic interplay of the characteristics of the disaster itself, the losses of the victims, and the complex set of family and cultural traditions, resources, and ways of responding to stress.

In this study, we have tried to select a reasonable set of variables to examine, but as in all such enterprises, several factors may have been overlooked or arbitrarily excluded. If the omissions are glaring, we hope other researchers may profit from such oversights by focusing on them in future research.

Among the few general conclusions that may be drawn from this study, the most obvious is that poor families and large families have the most trouble acquiring adequate aid and recovering from disaster, and are consequently more vulnerable to a disaster. Members of ethnic minorities, particularly blacks and Hispanics, are typically more likely to belong to such families. These families have greater numbers of non-productive dependents, poorer insurance coverage, less money in savings accounts, and fewer personal resources. As noted in the theoretical discussion of stress (Chapter II), such families are under stress even prior to a disaster and have fewer abilities (material, social, or psychological) to cope with additional demands. Recovery policies should recognize this fact so that social inequities will not be magnified by a disaster.

This study found that blacks and Hispanics used multiple aid sources in their efforts to recoup losses. Yet, they were still more likely than whites to evaluate aid received as inadequate and to recover economically more slowly. Clearly, programs for outreach to such groups must be expanded and used in disasters involving significant numbers of blacks or Hispanics. This recommendation is particularly pertinent for those involved in planning for earthquakes in southern California; such earthquakes will almost certainly involve both groups.

We also observed that certain ethnic/cultural traditions tend to keep some victims out of the formal aid network. In Utah, for example, the Mormon tradition of self-reliance, coupled with the church's elaborate, decentralized self-help system, encouraged citizens to use non-governmental aid. However, this situation is probably relatively unique; the LDS church could only maintain a private disaster recovery program because of its great wealth and far-reaching organization. It is unlikely that emergent or established organizations such as the Red Cross could alone provide adequate resources following a major disaster. The Utah case also highlighted certain organizational domain and conflict issues that emerged when established disaster organizations had to deal with a new and powerful aid group (the LDS Church) during response and recovery. Again, disaster planners could profit greatly if they would anticipate such interorganizational problems.

On Kauai, cultural traditions of family and self-reliance also seemed to keep Japanese out of the formal aid system. However, two additional factors (found significant at all sites) affected their response: loss levels and insurance coverage.

Loss levels, of course, are important because they create the need that results in a search for aid, and because they are used as guidelines for the receipt of aid. In addition, high loss levels are associated with the receipt of aid from a primary group. Beyond that, however, loss levels are related to both ethnicity and class. Cultural traditions determining home sites (Kauai) and patterns of residential segregation (Paris), and class attributes influencing choice of house type (Coalinga and Paris) can all affect loss and the resultant need for aid. Thus even a seemingly "objective" category such as disaster loss is underlain by cultural and class factors.

Another revelation from this study is that lack of insurance or of adequate coverage forces victims into the formal aid system. In Coalinga, where few victims had earthquake insurance and in Utah, where few had flood insurance, this was quite clearly the case. At the other two sites, inadequate (rather than nonexistent) coverage was associated with victims seeking out additional sources of financial aid. In Paris, minorities and those of lower socioeconomic status were the most likely to rate their coverage as inadequate. Ethnicity and social class affect

strongly insurance use and its contribution to recovery.

While this study attempted to provide some initial answers to the question of race and ethnicity in long-term family recovery, the issues are complex, interwoven, and amenable to only the broadest interpretation at this point. At the time of these interviews--eight months following the disasters--many families had not yet recovered fully or, in the case of the poorest minorities, even begun to recover. Thus the families were in or entering a process of change (see, for example, Drabek and Key, 1984). Part of any future research program should examine the effect of such changes on the various categories of victims over the three to five years following impact.

Disaster recovery planners should recognize the differential access to, and utilization of, formal and informal aid programs. It appears that it is difficult for some disaster victims--particularly those of lower socioeconomic class and those on fixed income--to qualify for some programs, such as SBA loans. Failure to receive such loans or grants to rebuild a home can mean a long-term decline in the quality of life and standard of living of poorer victims. The formal aid system has proven a key element in disaster recovery, but policies and standards that exclude minorities and the poor must be re-examined unless disasters are to create increasingly large social inequities.

APPENDIX A
ADDITIONAL TABLES FOR CHAPTER III

TABLE 1
MONTHLY HOUSEHOLD INCOME

INCOME	WHITE VICTIMS	BLACK VICTIMS
Less than \$500	20.8% (44)	59.8% (131)
\$500 - \$999	32.5% (69)	29.2% (64)
\$1,000 - \$1,999	32.5% (69)	9.6% (21)
\$2,000 and more	14.2% (30)	1.4% (3)
	n = 212	n = 219

$\chi^2 = 91.04, P < .02$

TABLE 2
HEAD OF HOUSEHOLD OCCUPATION

OCCUPATION	WHITE VICTIMS	BLACK VICTIMS
Unskilled Service Worker	11.0% (22)	44.0% (81)
Laborer	20.0% (40)	27.7% (51)
Operative	7.5% (15)	3.8% (7)
Craftsmen and Kindred	14.0% (28)	6.0% (11)
Skilled Service Worker	5.5% (11)	10.9% (20)
Clerical and Sales	11.0% (22)	2.7% (5)
Farmers and Ranchers	1.0% (2)	.5% (1)
Managers	21.5% (43)	2.2% (4)
Professionals	8.5% (17)	2.2% (4)
	n = 200	n = 184

(47 missing observations)
 $\chi^2 = 99.01, P < .05$

TABLE 3
HEAD OF HOUSEHOLD EDUCATION

EDUCATION LEVEL	WHITE VICTIMS	BLACK VICTIMS
Less than High School	46.7% (98)	56.9% (124)
High School Graduate	23.8% (50)	30.3% (66)
Some College or Technical School	14.3% (30)	8.7% (19)
College Graduate and Post Graduate	15.2% (32)	4.1% (9)
	n = 210	n = 218

(3 missing observations)
 $\chi^2 = 20.48, P < .05$

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TABLE 4
HOUSEHOLD SIZE

NUMBER OF HOUSEHOLD MEMBERS AT TIME OF TORNADO	WHITE VICTIMS	BLACK VICTIMS
1	18.9% (40)	22.8% (50)
2	37.7% (80)	20.5% (45)
3	17.9% (38)	17.4% (38)
4	15.1% (32)	14.2% (31)
5 or more	10.4% (22)	25.1% (55)
	n = 212	n = 219

$\chi^2 = 24.96, P < .05$

TABLE 5
HOUSEHOLD TYPE

HOUSEHOLD TYPE	WHITE VICTIMS	BLACK VICTIMS
Non-childrearing Households	61.3% (130)	47.5% (104)
Households with Dependent Children	33.0% (70)	37.9% (83)
Three Generation Household	5.7% (12)	14.6% (32)
	n = 212	n = 219

$\chi^2 = 12.97, P < .05$

TABLE 6
MARITAL STATUS OF RESPONDENT

STATUS	WHITE VICTIMS	BLACK VICTIMS
Married	67.9% (144)	30.1% (66)
Single	8.0% (17)	20.5% (45)
Divorced	6.6% (14)	11.9% (26)
Separated	1.4% (3)	8.7% (19)
Widowed	16.0% (34)	28.8% (63)
	n = 212	n = 219

$\chi^2 = 64.43, P < .05$

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TABLE 7
AGE OF RESPONDENT

AGE GROUP	WHITE VICTIMS	BLACK VICTIMS
Less than 30 Years	17.0% (36)	18.7% (41)
30 to 59 Years	44.8% (95)	43.4% (95)
60 Years and Older	38.2% (81)	37.9% (83)
	n = 212	n = 219

$\chi^2 = .24$, N.S.

TABLE 8
DAMAGE TO RESIDENCE

PERCENT OF HOUSE DESTROYED	WHITE VICTIMS	BLACK VICTIMS
1% - 25%	28.8% (61)	26.9% (59)
26% - 50%	19.8% (42)	26.9% (59)
51% - 75%	8.0% (17)	9.6% (21)
76% - 99%	5.7% (12)	3.2% (7)
100%	37.7% (80)	33.3% (73)
	n = 212	n = 219

$\chi^2 = 4.84$, N.S.

TABLE 9
DOLLAR LOSS TO HOUSE
STRUCTURE BY RACE

AMOUNT OF LOSSES TO HOUSE	WHITE VICTIMS	BLACK VICTIMS
Less than \$5,000	25.3% (45)	36.5% (42)
\$5,000 - \$15,000	29.8% (53)	34.8% (40)
\$16,000 - \$25,000	20.8% (37)	9.6% (11)
\$26,000 - \$35,000	8.4% (15)	12.2% (14)
\$36,000 or more	15.7% (28)	7.0% (8)
	n = 178	n = 115

$\chi^2 = 14.26$, $P < .05$

138 Missing Observations: 132 rented their homes - 12.3% (26) white victims; 48.4% (106) black victims.

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TABLE 10

DAMAGE TO HOME
CONTENTS BY RACE

PERCENT OF CONTENTS DESTROYED	WHITE VICTIMS	BLACK VICTIMS
1% - 25%	43.4% (92)	42.9% (93)
26% - 50%	14.6% (31)	22.6% (49)
51% - 75%	8.0% (17)	6.0% (13)
76% - 99%	5.7% (12)	8.3% (18)
100%	28.3% (60)	20.3% (44)
	n = 212	n = 217

$\chi^2 = 8.19, P < .05$

TABLE 11

DOLLAR LOSS TO HOME
CONTENTS BY RACE

AMOUNT OF LOSSES TO HOME CONTENTS	WHITE VICTIMS	BLACK VICTIMS
Less than \$5,000	61.1% (118)	71.0% (130)
\$5,000 - \$10,000	22.3% (43)	21.9% (40)
\$10,100 - \$15,000	5.7% (11)	3.8% (7)
\$15,100 - \$20,000	3.6% (7)	1.1% (2)
More than \$20,000	7.3% (14)	2.2% (4)
	n = 193	n = 183

$\chi^2 = 9.65, P < .05$
55 Missing Observations

TABLE 12

LOSSES BY VICTIM INCOME LEVELS

	DAMAGE LEVELS TO HOUSE STRUCTURES	
	HIGH DAMAGE*	MODERATE DAMAGE*
<u>WHITE VICTIMS</u>		
High Income**		
n = 62	30.6% (19)	69.4% (43)
Moderate Income**		
n = 150	40.7% (61)	59.3% (89)
<u>BLACK VICTIMS</u>		
High Income		
n = 10	10.0% (1)	90.0% (9)
Moderate Income		
n = 209	34.4% (72)	65.6% (137)
	DAMAGE LEVELS TO HOME CONTENTS	
	HIGH DAMAGE***	MODERATE DAMAGE***
<u>WHITE VICTIMS</u>		
High Income		
n = 62	19.4% (12)	80.6% (50)
Moderate Income		
n = 150	32.0% (48)	68.0% (102)
<u>BLACK VICTIMS</u>		
High Income		
n = 10	- (0)	100.0% (10)
Moderate Income		
n = 209	21.3% (44)	78.7% (163)

2 Missing Observations

*High Damage (Structure) is equivalent to 75% to 100% of structure destroyed.

Moderate Damage (Structure) is equivalent to 0-74% of structure destroyed.

**High Income is equivalent to \$1300+ earned per month.

Moderate Income is equivalent to \$0-1,299 earned per month.

***High Damage (Contents) is equivalent to 100% of contents destroyed.

Moderate Damage (Contents) is equivalent to 0-99% of contents destroyed.

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TABLE 13

NUMBER OF INJURIES WITHIN
PRIMARY GROUPS

	<u>NUMBER OF RELATIVES INJURED</u>	
	NONE	ONE OR MORE
WHITE VICTIMS n = 212	92.9% (197)	7.1% (15)
BLACK VICTIMS n = 219	93.2% (204)	6.8% (15)
$\chi^2 = 0.0$, N.S.		
	<u>NUMBER OF FRIENDS INJURED</u>	
	NONE	ONE OR MORE
WHITE VICTIMS n = 212	90.1% (191)	9.9% (21)
BLACK VICTIMS n = 219	80.4% (176)	19.6% (43)
$\chi^2 = 7.31$, $P < .05$		
	<u>NUMBER OF NEIGHBORS INJURED</u>	
	NONE	ONE OR MORE
WHITE VICTIMS n = 212	87.7% (186)	12.3% (26)
BLACK VICTIMS n = 219	87.2% (191)	12.8% (28)
$\chi^2 = 0.0$, N.S.		

TABLE 14

NUMBER OF DEATHS WITHIN
PRIMARY GROUPS

	NUMBER OF RELATIVES KILLED	
	NONE	ONE OR MORE
WHITE VICTIMS n = 212	93.9% (199)	6.1% (13)
BLACK VICTIMS n = 219	95.0% (208)	5.0% (11)
$\chi^2 = 0.09$, N.S.		
	NUMBER OF FRIENDS KILLED	
	NONE	ONE OR MORE
WHITE VICTIMS n = 212	82.5% (175)	17.5% (37)
BLACK VICTIMS n = 219	68.9% (151)	31.1% (68)
$\chi^2 = 10.08$, $P < .05$		
	NUMBER OF NEIGHBORS KILLED	
	NONE	ONE OR MORE
WHITE VICTIMS n = 212	86.8% (184)	13.2% (28)
BLACK VICTIMS n = 219	88.1% (193)	11.9% (26)
$\chi^2 = 0.07$, N.S.		

TABLE 15

EMOTIONAL IMPACT OF DEATHS IN
PRIMARY GROUP

	EMOTIONAL RECOVERY	
	INCOMPLETE	COMPLETE

WHITE VICTIMS

Number of Relatives Killed		
None (n = 199)	54.3% (108)	45.7% (91)
1 or More (n = 13)	84.6% (11)	15.4% (2)
	$\chi^2 = 3.41, P < .05$	
Number of Friends Killed		
None (n = 175)	56.6% (99)	43.4% (76)
1 or More (n = 37)	54.1% (20)	45.9% (17)
	$\chi^2 = 0.01, N.S.$	
Number of Neighbors Killed		
None (n = 184)	53.8% (99)	46.2% (85)
1 or More (n = 28)	71.4% (20)	28.6% (8)
	$\chi^2 = 2.39, N.S.$	

BLACK VICTIMS

Number of Relatives Killed		
None (n = 208)	65.4% (136)	34.6% (72)
1 or More (n = 11)	63.6% (7)	36.4% (11)
	$\chi^2 = 0.0, N.S.$	
Number of Friends Killed		
None (n = 151)	64.2% (97)	35.8% (54)
1 or More (n = 68)	67.6% (46)	32.4% (22)
	$\chi^2 = 0.11, N.S.$	
Number of Neighbors Killed		
None (n = 193)	64.2% (124)	35.8% (69)
1 or More (n = 26)	73.1% (19)	26.9% (7)
	$\chi^2 = 0.45, N.S.$	

TABLE 16

POST-TORNADO RESIDENTIAL CHANGES

	TOTAL NUMBER OF RESIDENTIAL CHANGES	
	≤ 2	≥ 3
<u>WHITE VICTIMS</u>		
High Damage n = 80	46.3% (37)	53.8% (43)
Moderate Damage n = 132	84.1% (111)	15.9% (21)
<u>BLACK VICTIMS</u>		
High Damage n = 73	58.9% (43)	41.1% (30)
Moderate Damage n = 146	90.4% (132)	9.6% (14)
<u>WHITE VICTIMS</u>		
High Income n = 62	61.3% (38)	38.7% (24)
Moderate Income n = 150	73.3% (110)	26.7% (40)
<u>BLACK VICTIMS</u>		
High Income n = 10	60.0% (6)	40.0% (4)
Moderate Income n = 209	80.9% (169)	19.1% (40)
<u>WHITE VICTIMS</u>		
Under 60 Years of Age n = 131	60.3% (79)	39.7% (52)
60 Years and Older n = 81	85.2% (69)	14.8% (12)
<u>BLACK VICTIMS</u>		
Under 60 Years of Age n = 136	76.5% (104)	23.5% (32)
60 Years and Older n = 83	85.5% (71)	14.5% (12)

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TABLE 17
EFFECTS OF RESIDENTIAL CHANGES ON VICTIMS

VICTIM EXPERIENCES	NUMBER OF POST-DISASTER MOVES	
	≤ 2	≥ 3
WHITE VICTIMS		
Reduced Leisure	34.5% (51)	42.2% (27)
Storm Related Upsets	54.7% (81)	60.9% (39)
Family Strains	19.6% (29)	31.3% (20)
	n = 148	n = 64
BLACK VICTIMS		
Reduced Leisure	38.9% (68)	38.9% (17)
Storm Related Upsets	61.7% (108)	81.8% (36)
Family Strains	36.6% (64)	47.7% (21)
	n = 175	n = 44

TABLE 18
FAMILY DISRUPTION DUE TO
RESIDENTIAL CHANGE

	<u>RESIDENTIAL CHANGE DISRUPTION INDEX*</u>		
	None	Moderate	High
WHITE VICTIMS	8.8% (13)	35.4% (52)	55.8% (82)
≤ 2 Changes	8.4% (7)	39.8% (33)	51.8% (43)
≥ 3 Changes	9.4% (6)	29.7% (19)	60.9% (39)
BLACK VICTIMS	3.5% (5)	20.6% (29)	75.9% (107)
≤ 2 Changes	5.2% (5)	23.7% (23)	71.1% (69)
≥ 3 Changes	-	13.6% (6)	86.4% (38)

*Index is based on 288 families who experienced residential changes.

TABLE 19
FAMILY DISRUPTION DUE TO
RESIDENTIAL REPAIRS

	<u>RESIDENTIAL REPAIR DISRUPTION INDEX*</u>		
	None	Moderate	Extreme
WHITE VICTIMS	8.9% (11)	50.4% (62)	40.7% (50)
BLACK VICTIMS	6.9% (8)	47.4% (55)	45.7% (53)

*Index is based on 239 families lived in their homes during which repair work was being performed.

TABLE 20

CHANGES IN VISITATION RATES
OF VICTIMS

KIN VISITATION FREQUENCY				
	Pre-Tornado		Nov. 1982	
	# of Monthly Visits		# of Monthly Visits	
	≤5	≥6	≤5	≥6
<u>VICTIMS</u>				
n = 431	52.2% (225)	47.8% (206)	51.5% (222)	48.5% (209)
<u>WHITE VICTIMS</u>				
n = 212	53.3% (113)	46.7% (99)	52.8% (112)	47.2% (100)
High Damage				
n = 80	58.8% (47)	41.3% (33)	57.5% (46)	42.5% (34)
Moderate Damage				
n = 132	50.0% (66)	50.0% (66)	50.0% (66)	50.0% (66)
<u>BLACK VICTIMS</u>				
n = 219	51.1% (112)	48.9% (107)	50.2% (110)	49.8% (109)
High Damage				
n = 73	58.9% (43)	41.1% (30)	54.8% (40)	45.2% (36)
Moderate Damage				
n = 146	47.3% (69)	52.7% (77)	47.9% (70)	52.1% (76)

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TABLE 20 (Continued)
VISITATION FREQUENCY WITH FRIENDS

	Pre-Tornado # of Monthly Visits		Nov. 1982 # of Monthly Visits	
	≤5	≥6	≤5	≥6
<u>VICTIMS</u>				
n = 431	64.7% (279)	35.3% (152)	65.0% (280)	35.0% (151)
<u>WHITE VICTIMS</u>				
n = 212	65.1% (138)	34.9% (74)	64.6% (137)	35.4% (75)
High Damage				
n = 80	67.5% (54)	32.5% (26)	67.5% (54)	32.5% (26)
Moderate Damage				
n = 132	63.6% (84)	36.4% (48)	62.9% (83)	37.1% (49)
<u>BLACK VICTIMS</u>				
n = 219	64.4% (141)	35.6% (78)	65.3% (143)	34.7% (76)
High Damage				
n = 73	71.2% (52)	28.8% (21)	74.0% (54)	26.0% (19)
Moderate Damage				
n = 146	61.0% (89)	39.0% (57)	61.0% (89)	39.0% (57)
NEIGHBOR VISITATION FREQUENCIES				
<u>VICTIMS</u>				
n = 431	65.2% (281)	34.8% (150)	64.7% (279)	35.3% (152)
<u>WHITE VICTIMS</u>				
n = 212	69.8% (148)	30.2% (64)	67.5% (143)	32.5% (26)
High Damage				
n = 80	68.8% (55)	31.3% (25)	67.5% (54)	32.5% (26)
Moderate Damage				
n = 132	70.5% (93)	29.5% (39)	67.4% (89)	32.6% (43)
<u>BLACK VICTIMS</u>				
n = 219	60.7% (133)	39.3% (86)	62.1% (136)	37.9% (83)
High Damage				
n = 146	68.5% (100)	31.5% (46)	68.5% (100)	31.5% (46)
Moderate Damage				
n = 73	56.8% (41)	43.2% (32)	58.9% (43)	41.1% (30)

TABLE 21

POST-DISASTER CHANGES IN
STANDARD OF LIVING

<u>CHANGES IN STANDARD OF LIVING SINCE STORM</u>		
	LOWERED	REMAINED SAME OR RISEN
<u>VICTIMS</u>		
n = 431	28.1% (121)	71.9% (310)
<u>WHITE VICTIMS</u>		
n = 212	17.9% (38)	82.1% (174)
<u>BLACK VICTIMS</u>		
n = 219	37.9% (83)	62.1% (136)
<u>WHITE VICTIMS</u>		
High Damage n = 80	31.3% (25)	68.8% (55)
Moderate Damage n = 132	9.8% (13)	90.2% (119)
<u>BLACK VICTIMS</u>		
High Damage n = 73	42.5% (31)	57.5% (42)
Moderate Damage n = 146	35.6% (52)	64.4% (94)
<u>WHITE VICTIMS</u>		
Under 60 Years of Age n = 131	15.3% (20)	84.7% (111)
60 Years and Older n = 81	22.2% (18)	77.8% (63)
<u>BLACK VICTIMS</u>		
Under 60 Years of Age n = 136	43.4% (59)	56.6% (77)
60 Years and Older n = 83	28.9% (24)	71.1% (59)

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TABLE 22
POST-DISASTER INCREASES
IN COST OF LIVING

<u>THOSE AGREEING WITH THE STATEMENT THAT</u>	<u>WHITE VICTIMS</u>	<u>BLACK VICTIMS</u>
	n = 212	n = 219
Prices have risen since the tornado	48.1% (102)	70.8% (155)
My expenses have risen since the tornado	40.6% (86)	67.2% (147)
The cost of my housing has risen since the storm	35.4% (75)	48.9% (107)

TABLE 23
STORM-RELATED FAMILY PSYCHOSOCIAL IMPACTS

SELF-REPORTED IMPACTS	PERCENT AGREEING	
	WHITE VICTIMS	BLACK VICTIMS
Upsets With Storm	56.6% (120)	65.8% (144)
Time Pressures	45.3% (96)	49.7% (109)
Lack of Patience	32.1% (68)	42.9% (94)
Strained Family Relationships	23.1% (49)	38.8% (85)
Strengthened Family Ties	93.9% (199)	87.7% (192)
Decreased Importance of Material Possessions	61.8% (131)	63.0% (138)
Increased Family Happiness	27.4% (58)	19.6% (43)
	n = 212	n = 219

TABLE 24
INCIDENCE OF STRAINS IN
FAMILY RELATIONSHIPS
PROPORTION OF SAMPLE REPORTING STRAINS
IN FAMILY RELATIONS

	WHITE	BLACKS
Victims Overall	23.1% (49)	38.8% (85)
High Loss Victims	35.0% (28)	42.5% (31)
Moderate Loss Victims	15.9% (21)	37.0% (54)
Under 60 Yrs. of Age	28.2% (37)	46.3% (63)
60 Yrs. and Older	14.8% (12)	26.5% (22)
	N = 212	N = 219

TABLE 25
INCIDENCE OF DISRUPTIONS
IN FAMILY LIFE

	RESPONDENTS INDICATING STORM RELATED DISRUPTIONS OF FAMILY LIFE	
	WHITES	BLACKS
Victims	32.1% (66)	47.0% (103)
High Damage	21.2% (28)	44.5% (65)
Moderate Damage	47.5% (38)	52.1% (38)
Under 60 Yrs. of Age	32.1% (42)	52.2% (71)
60 Yrs. of Age	29.6% (224)	38.6% (32)

TABLE 26
POST-TORNADO HOUSING IMPACT EVALUATIONS

RESPONDENT EVALUATION OF HOUSING SITUATION	RESPONDENTS AGREEING	
	WHITE VICTIMS	BLACK VICTIMS
Current Housing is as Nice as Pre-Tornado Housing	76.4% (162)	62.5% (137)
Satisfied With Comfort of Current Housing	88.7% (188)	76.7% (168)
Current Housing Better Built and Safer	35.9% (76)	29.2% (64)
Current Housing Makes it Difficult to Recover	14.2% (30)	21.0% (46)

TABLE 27
EFFECTS OF POST-DISASTER NEIGHBORHOOD
ON FAMILIES

RESPONDENT EVALUATION OF NEIGHBORHOOD CHANGES	RESPONDENTS AGREEING	
	WHITE VICTIMS	BLACK VICTIMS
Neighborhood Construction Has Been an Obstruction to Recovery	42.5% (90)	61.6% (135)
Post-Disaster Neighborhood is Less Pleasant Than Pre-Disaster	43.9% (93)	74.9% (164)

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TABLE 28
EMOTIONAL IMPACTS OF THE TORNADO

SELF-REPORTED SYMPTOMS	WHITE VICTIMS	BLACK VICTIMS
Nervousness in Stormy Weather	88.7% (188)	86.8% (190)
Bad Dreams About the Storm	32.1% (68)	38.4% (84)
Sleeplessness	53.3% (113)	55.9% (122)
Separation* Fear in Children	85.6% (77)	91.9% (125)
Children** Nervous in Stormy Weather	90.2% (101)	91.8% (134)
	N = 212	N = 219

* For families with children responding to this question,
the n's are 90 for white victims and 136 for black
victims.

**For families with children responding to this question,
the n's are 112 for white victims and 134 for black victims.

TABLE 29
STORM ANXIETY AMONG VICTIMS

FAMILY CHARACTERISTIC	RESPONDENTS EXPRESSING NERVOUSNESS	
	WHITES	BLACKS
High Damage	93.8% (75) n = 80	87.7% (64) n = 73
Moderate Damage	85.6% (113) n = 132	86.3% (126) n = 146
Under 60 Years of Age	90.1% (118) n = 131	90.4% (123) n = 136
60 Years and Older	86.4% (70) n = 81	80.7% (67) n = 83
3 Persons or Less	87.3% (138) n = 158	84.2% (112) n = 133
4 or More Persons	92.6% (50) n = 54	90.7% (78) n = 86

TABLE 30
RESPONDENT ATTITUDES

Appendix A

	WHITE VICTIMS	BLACK VICTIMS
Index Item	Percent Agreeing With Statement	
Many times I feel that I have little influence over the things that happen to me.	58.5% (124)	60.7% (133)
In the long run the bad things that happen to us are balanced by the good ones.	91.0% (193)	73.5% (161)
It is not always wise to plan too far ahead because many things turn out to be a matter of luck (good or bad) anyhow.	57.5% (122)	80.8% (177)
Sometimes I feel that I don't have enough control over the direction my life is taking.	34.4% (73)	46.6% (102)
	N = 212	N = 219

TABLE 31
FATALISM AND DISASTER LOSSES
AGREEMENT WITH FATALISM ITEMS*

	1	2	3	4
WHITE VICTIMS				
High Damage n = 80	63.8% (51)	90.0% (72)	65.0% (52)	40.0% (32)
Moderate Damage n = 132	55.3% (73)	91.7% (121)	53.0% (70)	31.1% (41)
	$\chi^2 = 1.14$ Sig. = .286	$\chi^2 = .03$ Sig. = .870	$\chi^2 = 2.45$ Sig. = .117	$\chi^2 = 1.39$ Sig. = .239
BLACK VICTIMS				
High Damage n = 73	60.3% (44)	65.8% (48)	78.1% (57)	39.7% (29)
Moderate Damage n = 146	61.0% (89)	77.4% (113)	82.2% (120)	50.0% (73)
	$\chi^2 = 0.0$ Sig. = 1.000	$\chi^2 = 2.82$ Sig. = .093	$\chi^2 = .30$ Sig. = .585	$\chi^2 = 1.67$ Sig. = .196

*Fatalism was measured using the following statements:

1. Many times I feel that I have little influence over the things that happen to me.
2. In the long run the bad things that happen to us are balanced by the good ones.
3. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad luck.
4. Sometimes I feel that I don't have enough control over the direction my life is taking.

APPENDIX B
ADDITIONAL TABLES FOR CHAPTERS V AND VI

TABLE 1
RED CROSS DAMAGE ESTIMATES FOR HURRICANE IWA,
KAUAI, HAWAII, NOVEMBER 23, 1982

Deaths:	0 (2 on Oahu)	
Injuries:	7 hospitalized	
Residential Damage:	OF 14,800 total housing units, 4,845 were damaged or destroyed.	
	<u>Single Family</u>	<u>Apartments/Condos</u>
Destroyed:	209	314
Major Damage:	1,134	292
Minor Damage:	2,699	197
FEMA's 1/5/83 estimate placed residential losses at \$41 million plus losses to public housing alone totalling \$2.2 million.		
Business Losses:	75 small business destroyed or sustaining major damage; 105 small businesses were damaged altogether.	
	\$59.5 million loss to business, excluding agriculture. Most of this was to resort hotels and apartments.	
	State Agriculture Department estimated almost \$15 million to facilities.	
	Due to island-wide power failure, nearly every household suffered the loss of perishable food items. In some communities electricity outages lasted over two weeks.	
	An estimated \$234 million in losses statewide, with most of this impacting Kauai.	
	Actual business losses are expected vary from \$67 million to \$151 million, depending on the recovery of the tourist industry.	

TABLE 2
COMPILATION OF INFORMATION ON
DAMAGE AND INJURIES ATTRIBUTABLE TO THE
COALINGA EARTHQUAKE, MAY 2, 1983

Deaths:	0	
Injuries:	32 Major (21 hospitalized)	
	173 Minor	
Residential Damage:	Of 2,500 housing units total, 2,092 were damaged or destroyed (About 1000 persons displaced).	
	<u>Single Family</u>	<u>Apartments</u>
Destroyed:	309	33
Major Damage:	653	39
Minor Damage:	985	73
Business Damage:	46 of 51 Total Buildings Destroyed	
	141 Businesses Damaged (According to state Office of Emergency Services report to Governor, 5/4/83)	
Total Estimated Loss:	\$31,076,300 (\$5,947,300 of this public)	
	242	

TABLE 3
Survey Completion Summary

Appendix B

	Coalinga	Kauai
1. Dwelling units selected from sampling frame	400 = 22% of impacted residences	521 = 13% of impacted residences from 3 districts
2. Number interviewed of initial sample drawn	256 (64%)	417 (80%)
3. Number of substitutions for unlocated households	40	29
4. Number of Hispanic families added to assure representation in sample	80	NA
5. Residents moved and untraceable (For Coalinga, 6 had moved there after quake)	27	42
6. Residents unable to complete interview due to illness or incapacity	6	2
7. Refusals	77	41
8. Residents not at home after three attempts	24	19
9. Total number of interviews attempted	520	550
10. Total number interviewed (Completion rate)	376 (72.3%) 21% of impacted households	446 (18%) 11% of impacted households

TABLE 4
COMPARISON OF ETHNIC GROUPS IN THE KAUAI AND COALINGA SAMPLES,
BY AGE GROUP OF HEAD OF HOUSEHOLD (Percent)

	Caucasian	Kauai Japanese	Filipino	Coalinga Anglo	Hispanic
AGE GROUP (in years)					
17 thru 29	13.2	6.1	8.0	20.2	38.4
30 thru 39	37.5	13.9	14.8	27.5	19.6
40 thru 49	16.2	19.1	22.7	21.7	16.1
50 thru 59	15.4	21.7	21.6	10.1	12.5
60 thru 69	11.8	25.2	17.0	8.9	12.5
70 thru 79	4.4	11.3	11.4	7.4	.9
80 and over	1.5	2.6	4.3	4.3	--
Total %	100.0	100.0	100.0	100.0	100.0
Respondents, N=	136	115	88	258	112
Nonrespondents, N=	1	2	1	2	4

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TABLE 5
COMPARISON OF ETHNIC GROUPS IN THE KAUAI AND COALINGA SAMPLES,
BY LENGTH OF RESIDENCE (Percent)

A. Length of Residence at Pre-disaster Address

YEARS	Kauai			Coalinga	
	Caucasian	Japanese	Filipino	Anglo	Hispanic
1 year or less	21.3	4.3	7.9	19.6	21.6
2 - 5 years	32.4	17.2	28.1	34.6	41.4
6 - 10 years	19.9	19.0	15.7	13.8	19.0
11 - 15 years	10.3	16.4	19.1	10.0	10.3
Over 15 years	16.2	43.1	29.2	21.9	7.8
Total %	100.0	100.0	100.0	100.0	100.0
Respondents, N=	136	116	89	260	116
Nonrespondents, N=	1	1	0	0	0

B. Length of Residence in the Community

YEARS	Kauai*			Coalinga	
	Caucasian	Japanese	Filipino	Anglo	Hispanic
1 year or less	7.4	--	--	3.8	4.3
2 - 5 years	23.5	6.9	6.8	18.5	15.5
6 - 10 years	15.4	6.0	14.8	16.1	24.1
11 - 15 years	13.2	6.0	10.2	12.3	11.2
16 - 20 years	8.8	6.9	9.1	10.0	12.9
Over 20 years	31.6	74.1	59.3	39.2	31.9
Total %	100.0	100.0	100.0	100.0	100.0
Respondents, N=	136	116	88	260	116
Nonrespondents, N=	1	0	1	0	0

* The disaster area for the study in Hawaii was the Island of Kauai, rather than one particular community. Kauai respondents were asked how many years they had lived on Kauai. Even though there are many communities on the various islands, we believe that one's island of residence provides a distinct residential identity. Since the hurricane affected virtually all of populated Kauai, residents considered the island, and not just specific communities, as a disaster area.

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TABLE 6

COMPARISON OF ETHNIC GROUPS IN THE KAUAI AND COALINGA SAMPLES,
BY OWNERSHIP OF DWELLING

	<u>Caucasian</u>	<u>Kauai Japanese</u>	<u>Filipino</u>	<u>Coalinga Anglo</u>	<u>Hispanic</u>
DWELLING OWNERSHIP (Pre-disaster)					
Owner of residence	40.1	70.9	41.6	65.3	31.9
Renter of residence	58.4	26.5	58.4	33.8	50.0
Provided by third party*	<u>1.4</u>	<u>2.6</u>	<u>--</u>	<u>.4</u>	<u>18.1</u>
Total %	100.0	100.0	100.0	100.0	100.0
Respondents, N=	137	116	89	260	116
Nonrespondents, N=	0	0	0	0	0

* For example, a few agricultural workers in each sample were provided rent-free housing on the plantations or cotton farms. A few respondent families lived in housing loaned by parents. Households were coded as renters if they said they rented their housing from their employer.

TABLE 7

COMPARISON OF ETHNIC GROUPS IN THE KAUAI AND COALINGA SMPLES,
BY EXTENDEDNESS OF HOUSEHOLD (Percent)

	<u>Caucasian</u>	<u>Kauai Japanese</u>	<u>Filipino</u>	<u>Coalinga Anglo</u>	<u>Hispanic</u>
NUMBER OF GENERATIONS IN HOUSEHOLD (Pre-disaster)					
One person household*	11.8	15.5	5.6	15.0	8.6
More than 1 person, same generation**	27.9	39.8	37.1	25.8	26.7
Two generations#	52.9	36.2	44.9	55.6	62.1
Three or more generations##	<u>7.4</u>	<u>9.5</u>	<u>12.4</u>	<u>4.2</u>	<u>2.6</u>
Total %	100.0	100.0	100.0	100.0	100.0
Respondents, N=	136	116	89	260	116
Nonrespondents, N=	1	1	0	0	0

* Refers to one adult, living alone.

**More than one adult, such as husband and wife, no children; or adult siblings.

Typically one or two parents and one or more minor children; can also be adult child or couple and their parents.

##Minor children, their parents, and the children's grandparent(s).

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TABLE 8

COMPARISON OF ETHNIC GROUPS IN THE KAUAI AND COALINGA SMPLES
BY SIZE OF HOUSEHOLD

SIZE OF HOUSEHOLD (Pre-disaster)	<u>Caucasian</u>	<u>Kauai Japanese</u>	<u>Filipino</u>	<u>Coalinga</u>	
				<u>Anglo</u>	<u>Hispanic</u>
1 person	10.9	10.3	5.8	12.7	6.9
2 persons	27.0	26.7	23.3	24.2	15.5
3 persons	16.8	22.4	18.6	18.7	20.7
4 persons	23.4	17.2	20.9	24.2	24.1
5 persons	13.1	15.5	14.0	13.5	19.0
6 or more persons	<u>8.8</u>	<u>7.8</u>	<u>17.4</u>	<u>6.5</u>	<u>13.3</u>
Total %	100.0	100.0	100.0	100.0	100.0
Respondents, N=	137	116	86	260	116
Nonrespondents, N=	0	1	3	0	0

TABLE 9

COMPARISON OF ETHNIC GROUPS IN THE KAUAI AND COALINGA SMPLES,
BY OCCUPATIONAL CATEGORY OF HEAD OF HOUSEHOLD (Percent)

OCCUPATIONAL LEVEL*	<u>Caucasian</u>	<u>Kauai Japanese</u>	<u>Filipino</u>	<u>Coalinga</u>	
				<u>Anglo</u>	<u>Hispanic</u>
Unskilled service worker**	13.9	11.8	10.7	17.1	23.5
Laborer	6.2	11.8	28.6	10.0	30.4
Operative	4.6	5.5	15.5	10.8	19.1
Craftsman	20.0	27.3	15.5	30.0	17.4
Skilled service worker	.8	6.4	4.8	4.0	.9
Clerical, sales	15.4	9.1	9.5	5.2	1.7
Managers, farm & ranch operator	12.3	11.8	7.1	8.8	3.5
Professional	<u>26.9</u>	<u>16.4</u>	<u>8.3</u>	<u>14.0</u>	<u>3.5</u>
Total %	100.0	100.0	100.0	100.0	100.0
Respondents, N=	130	110	84	250	115
Nonrespondents, N=	7	7	5	10	1

* For current or last held job.

**Includes "never worked" (typically students) and housewives.

TABLE 10

COMPARISON OF ETHNIC GROUPS IN THE KAUAI AND COALINGA SAMPLES,
BY EMPLOYMENT CATEGORY OF HEAD OF HOUSEHOLD (Percent)

EMPLOYMENT CATEGORY (at time of interview)	<u>Caucasian</u>	<u>Kauai Japanese</u>	<u>Filipino</u>	<u>Coalinga Anglo</u>	<u>Hispanic</u>
Working full time	67.2	55.6	58.4	72.3	70.7
Working part time	8.8	3.4	6.7	1.5	7.3
Retired	13.9	32.5	27.0	13.5	6.9
Homemaker	2.9	1.7	1.1	4.2	1.7
Disabled	1.5	3.4	5.6	4.2	6.9
Unemployed	5.8	2.6	1.1	3.5	4.3
Other	--	.9	--	.8	1.7

TABLE 11

COMPARISON OF ETHNIC GROUPS IN THE KAUAI AND COALINGA SAMPLES,
BY MONTHLY INCOME CATEGORY (Percent)

MONTHLY FAMILY INCOME	<u>Caucasian</u>	<u>Kauai Japanese</u>	<u>Filipino</u>	<u>Coalinga Anglo</u>	<u>Hispanic</u>
\$000 - \$600	14.2	10.7	16.4	10.6	32.1
\$601 - \$800	10.4	13.1	17.8	6.5	20.8
\$801 - \$1000	19.8	20.2	19.2	10.6	15.1
\$1001 - \$1500	29.2	36.9	24.7	25.5	20.8
\$1501 - \$2000	17.0	9.5	5.5	19.0	9.4
\$2001 & over	9.4	9.5	16.4	27.8	1.9

TABLE 12

COMPARISON OF ETHNIC GROUPS IN THE KAUAI AND COALINGA SAMPLES,
BY EDUCATIONAL LEVEL OF HEAD OF HOUSEHOLD (Percent)

EDUCATIONAL LEVEL	<u>Caucasian</u>	<u>Kauai Japanese</u>	<u>Filipino</u>	<u>Coalinga Anglo</u>	<u>Hispanic</u>
Grade 9 or less	11.3	22.1	39.5	8.5	46.6
Some high school	4.0	4.4	7.0	11.6	20.7
High school graduate	33.1	32.7	20.9	32.6	19.0
Some college or technical school	29.0	21.2	17.4	27.5	10.3
College graduate	22.6	19.5	15.1	19.8	3.4

Appendix B

TABLE 13
DWELLING DAMAGE FOR KAUAI AND COALINGA
DISASTER VICTIM SAMPLES (Percent)

A. Damage to Dwelling: Structure*				
	N	<u>Kauai</u>		<u>Coalinga</u>
DAMAGE (Percent)		%	N	%
None	16	3.6	20	5.7
25% or less**	226	50.8	165	47.7
26% - 50%	112	27.4	54	15.5
51% - 75%**	44	9.9	17	4.9
76% - 99%	18	4.0	9	2.6
100%	<u>19</u>	<u>4.3</u>	<u>82</u>	<u>23.6</u>
Total	445	100.0	340	100.0
No Response	1		28	
Average				
Percent Damage		32.8		41.2
B. Damage to Dwelling: Contents				
	N	<u>Kauai</u>		<u>Coalinga</u>
DAMAGE (Percent)		%	N	%
None	102	23.0	2	.6
25% or less	215	48.4	209	57.6
26% - 50%	66	14.9	87	24.0
51% - 75%	21	4.7	24	6.6
76% - 99%	17	3.8	13	3.6
100%	<u>23</u>	<u>5.2</u>	<u>28</u>	<u>7.7</u>
Total	444	100.0	363	100.0
No Response	2		13	
Average				
Percent Damage		24.0		31.3

* Figures for Coalinga include total damage to dwelling and contents from the initial May 2nd earthquake and from succeeding aftershocks.

**Giving a percent figure for structural damage was difficult for apartment dwellers. For those unwilling to venture an estimate but who characterized the damage as minor, the response was coded 25%; for those who characterized the damage as major, the response was coded 75% (the latter only infrequently occurring).

TABLE 14

COMPARISON OF ETHNIC GROUPS IN THE KAUAI AND COALINGA SAMPLES,
BY LEVEL OF DAMAGE (Percent)

A. Percent of Structure Damaged

DAMAGE LEVEL	Caucasian	Kauai		Coalinga	
		Japanese	Filipino	Anglo	Hispanic
None	3.6	3.4	4.5	6.5	3.7
25% or less	50.4	57.3	49.4	57.3	26.2
26% - 50%	20.4	25.6	36.0	13.8	19.6
51% - 75%	10.9	10.3	5.6	2.9	9.3
76% - 99%	5.8	2.6	2.2	2.1	3.7
100%	8.8	.9	2.2	17.5	37.4
	100.0	100.0	100.0	100.0	100.0
Respondents, N=	136	117	89	240	7
Nonrespondents, N=	0	0	0	20	9

B. Percent of Contents Damaged

DAMAGE LEVEL	Caucasian	Kauai		Coalinga	
		Japanese	Filipino	Anglo	Hispanic
None	14.0	41.4	24.7	.4	1.0
25% or less	50.0	36.2	56.2	66.4	35.6
26% - 50%	14.7	15.5	11.2	22.0	28.8
51% - 75%	5.9	4.3	3.4	5.4	9.6
76% - 99%	5.9	--	3.4	3.1	4.8
100%	9.6	2.6	1.1	2.7	20.2
	100.0	100.0	100.0	100.0	100.0
Respondents, N=	136	116	89	259	104
Nonrespondents, N=	1	1	0	1	12

TABLE 15

COMPARISON OF ETHNIC GROUPS IN THE KAUAI AND COALINGA SAMPLES,
BY PERCEPTION OF POST-DISASTER CONDITION (Percent)

CONDITION RELATIVE TO OTHERS*	Caucasian	Kauai		Coalinga	
		Japanese	Filipino	Anglo	Hispanic
Much or somewhat better off	53.3	75.3	73.0	73.4	61.2
About the same	31.4	22.2	19.1	18.1	26.7
Somewhat or much worse off	15.3	2.6	7.9	8.5	12.0
Total %	100.0	100.0	100.0	100.0	100.0
Respondents, N=	137	117	89	260	116
Nonrespondents, N=	0	0	0	0	0

* Item wording was: "In terms of all your losses, how do you think your situation compares to others in (Coalinga/Kauai) who were also affected by the (disaster)?" Five choices, collapsed here to three, were read for the respondent to select from.

Appendix B

TABLE 16
DESTINATIONS OF DISLOCATED DISASTER VICTIMS, BY STAGE IN RELOCATION
PROCESS, FOR KAUAI AND COALINGA SAMPLES (Percent)

DESTINATION	Kauai			Coalinga		
	First Move	Second Move	Third Move	First Move	Second Move	Third Move
Moved in with relatives	39.4	7.4	2.1	33.9	13.5	11.3
Moved in with friends or neighbors	35.8	11.1	4.3	7.4	6.9	5.2
Went to an official shelter	12.1	0	0	.4	.7	0
Moved to rental apartment or house	5.4	17.3	34.1	2.9	17.1	42.6
Bought a house	1.8	1.9	0	0	0	4.3
Rented a hotel/motel room	1.8	1.9	2.1	1.8	3.3	1.7
Camped near own home	3.6	.6	0	53.7	9.9	7.8
Returned to pre-disaster dwelling	NA	59.9	57.4	NA	48.5	27.0
Total %	100.0	100.0	100.0	100.0	100.0	100.0
Number moving	165	162	47	283	274	115
Never left own dwelling	281			93		
Number not responding	0	0	2	0	0	0
Mean number of weeks at that location for those who moved again*	3.8 wks	6.7 wks	8.4 wks	2.9 wks	15.3 wks	13.4 wks

* Average, especially for First Move, is somewhat inflated by counting the response "1 week or less" as one week. Families which had not left their third destination are not included in the length-of-stay figure for the third move.

TABLE 17
DISRUPTION FROM RESIDENTIAL DISLOCATION AND REPAIRS
FOR KAUAI AND COALINGA SAMPLES (Percent)

A. Disruption from Residential Dislocation

DEGREE OF DISRUPTION**	Kauai		Coalinga	
	Households Which Moved Once or More*	All Households	Households Which Moved Once or More	All Households
4	38.7-1	57.7	35.2-1	55.5
3	19.0	7.0	20.3	15.2
2	17.2	6.3	17.1	12.8
1	11.7	4.3	16.0	12.0
0	13.5	4.9	11.4	8.6
Didn't Move	NA	63.4	NA	24.9
Total %	100.0	100.0	100.0	100.0
Respondents, N=	162	445	281	374
Nonrespondents, N=	1	1	2	2

B. Disruption from Residential Repair

DEGREE OF DISRUPTION**	Kauai		Coalinga	
	Households Which Moved Once or More*	All Households	Households Which Moved Once or More	All Households
4	18.9-1	38.1	22.3-1	40.2
3	19.2	14.9	17.9	8.8
2	31.4	24.3	26.6	13.1
1	19.5	15.1	24.5	12.0
0	11.0	8.6	8.2	4.0
Didn't Do Repairs	NA	22.5	NA	51.2
Total %	100.0	100.0	100.0	100.0
Respondents, N=	342	444	183	375
Nonrespondents, N=	2	2	1	1

* Dislocation includes short-term as well as long-term dislocations and single as well as multiple; that is, every household out of their dwelling one night or more, and no matter how many times they moved before locating permanently again.

** Measured with the item: On a scale of 0 to 4, would you rate how disrupted your household has been due to [moves/damages or repairs] since the [disaster]? 4 = Extremely disrupted; 0 = Not disrupted at all.

Appendix B

TABLE 18

LOSS OF WORK DUE TO CLOSURE OF WORK PLACE, FOR HEADS OF
HOUSEHOLD IN KAUAI AND COALINGA SAMPLES (Percent)

	Kauai		Coalinga	
	All Respondents	All Employed Respondents	All Employed Respondents	All Employed Respondents
DURATION OF CLOSURE				
Place of work of head of household not closed due to disaster	33.9	50.2	52.6	73.0
Closed one week or less	11.4	16.9	10.2	14.2
Closed one to two weeks	6.5	9.6	3.5	4.9
Closed two to three weeks	4.9	7.3	2.4	3.4
Closed three to four weeks	3.8	5.6	.3	.4
Closed four weeks or more	7.0	10.3	3.0	4.1
Not applicable, not working at time of disaster	32.5	NA	28.0	NA
Total (%)	100.0	99.9	100.0	100.0
Respondents, N=	466	150	371	72
Nonrespondents, N=	0	0	5	5
Not applicable, N=		296		299

TABLE 19

COMPARISON OF ETHNIC GROUPS IN THE KAUAI AND COALINGA SAMPLES,
BY NUMBER OF POST-DISASTER MOVES (Percent)

POST-DISASTER MOVES*	Caucasian	Kauai Japanese	Filipino	Coalinga Anglo	Hispanic
No moves	51.8	74.4	73.0	30.0	12.9
Moved once	1.5	.9	--	2.3	2.6
Moved twice	31.4	22.2	19.1	43.1	40.5
Moved three times	10.2	2.6	7.9	14.2	27.6
Moved four or more time	5.1	--	--	10.4	16.4
Total %	100.0	100.0	100.0	100.0	100.0
Respondents, N=	137	117	89	260	116
Nonrespondents, N=	0	0	0	0	0

* Every relocation is counted, including moving back to one's pre-disaster dwelling.

TABLE 20

Appendix B

EMOTIONAL STRAIN FROM THE DISASTER, COMPARISON OF
THE KAUAI AND COALINGA SAMPLES

	Kauai (N=446)		Coalinga (N=376)	
	N	%	N	%
A. Percent of households with one or more members experiencing emotional strain as a result of the disaster	192	43.0	243	64.6
B. Percent of those households which used formal counseling for this problem	23	12.0	69	28.4
C. Source of counseling (may have used one or more):				
Professional (e.g., physician, social worker, counselor)	8		51	
Church-related counseling	8		20	
Other	10		9	
D. Degree of strain related to subsequent earthquake tremors in Coalinga:				
Not at all disturbed			66	17.6
Somewhat disturbed			203	54.0
Very disturbed			107	28.5
			376	100.0

TABLE 21

COMPARISON OF ETHNIC GROUPS IN THE KAUAI AND COALINGA SAMPLES,
BY EMOTIONAL STRAIN FROM THE DISASTER

	Kauai			Coalinga	
	Caucasian (N=137)*	Japanese (N=117)	Filipino (N=89)	Anglo (N=260)	Hispanic (N=116)
A. Percent of households with some member(s) experiencing emotional strain* (Number)	44.5 (61)	40.2 (47)	38.2 (34)	69.6 (181)	53.4 (62)
B. Percent of above total which sought counseling (Number)	18.0 (11)	4.3 (2)	11.8 (4)	26.0 (47)	35.5 (22)

* The item wording was: "A number of people we have talked to have told us about the emotional strain they have experienced from the (disaster). Have you or anyone in your household experienced anything similar?"

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