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ADJUSTMENT TO DISASTER IMPACT

A Thesis

Presented to the

Department of Sociology

and the

Faculty of the Graduate College

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

University of Nebraska at Omaha

by

Gail Kara

July 1977

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THESIS ACCEPTANCE

Accepted for the faculty of the Graduate College,
University of Nebraska, in partial fulfillment of the re-
quirements for the degree Master of Arts, University of
Nebraska at Omaha.

Thesis Committee

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Date *July 29, 1977*

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INTRODUCTION

On May 6, 1975 a tornado touched down in the southwest corner of the city of Omaha, Nebraska. This tornado traveled in a northeasterly direction through residential, commercial, and industrial areas of the city. It left a path of destruction nine miles long and 600 yards wide, covering 2,000 blocks of the city. Both the death and injury tolls from the disaster were amazingly low. Three persons were killed and one-hundred and fifty-seven people were treated for injuries in hospitals.

Federal, city, and agency officials responded immediately to the tornado, resulting in the quickest recovery to date following a natural disaster. The entire Federal disaster team from the Federal Disaster Assistance Agency arrived in Omaha the day after the storm. The clean-up effort initiated by city government officials and disaster agencies was accomplished within two weeks of the disaster.

Approximately three months after the impact of the tornado, The Gerontology Program of the University of Nebraska at Omaha launched a research investigation of the victims' age-related needs and patterns of service utilization. In particular, the research focused on the effect

of the tornado on the lives of older persons.¹

To assess need differences between age groups, the research was designed to include interviews of adults equally divided into age cohorts of those over and under the age of sixty. Furthermore, interviews included victims of the tornado and non-victims, that is, those people who had not been directly affected by the disaster. Two hundred victims were interviewed and the control sample contained one hundred persons.

In addition to this extensive interviewing effort, data were also obtained from interviews and consultation with numerous disaster agency service providers. These agency personnel, who played a significant role in the recovery effort, included representatives of the Eastern Nebraska Office on Aging, the Department of Housing and Urban Affairs, the Red Cross, the Salvation Army, the Inter-faith Taskforce, the Mennonite Disaster Service and the Nebraska State Department of Welfare.

The thesis utilizes the data collected by the Gerontology Program's larger research endeavor. Variable relationships and the model of adjustment that are tested in this thesis have not been previously explored in the larger study.

¹The Gerontology Program's research results have been published in the document, Service Priorities for the Elderly in Natural Disasters (Bell et al., 1976).

Many of the questions representing the intervening variables were purposefully constructed and placed in the interview schedule for the express purpose of testing the thesis hypotheses. It is hoped that this analysis of data will add significantly to sociological knowledge in the areas of families under stress and social gerontology. Both areas lack extensive research and theory covering disaster-related situations.

STATEMENT OF THESIS RESEARCH

This thesis investigates the adjustment of individuals, grouped by age, hardship and family variables, to the impact of the May 6, 1975 Omaha tornado. Age of the victim and tornado-related hardship are hypothesized to be independent variables. The age and hardship cohorts are taken individually and in combination with each other to test their significance in the tornado recovery process. The dependent variable in this thesis is adjustment to disaster impact. Family relationship variables are tested to determine whether they strengthen or weaken age and hardship as these relate to cohort adjustment.

A model of adjustment has been designed to show the hypothesized interaction between the variables under investigation (see Figure 1). This thesis model closely approximates a model of adjustment used by Reuben Hill in his book, Families Under Stress (1949:197). Hill's model is shown in Figure 2.

Although the models are similar some differences are evident. The major difference between Hill's model and the thesis model is a further division of recuperative capacity. "Family recuperative capacity" is used by Hill as the

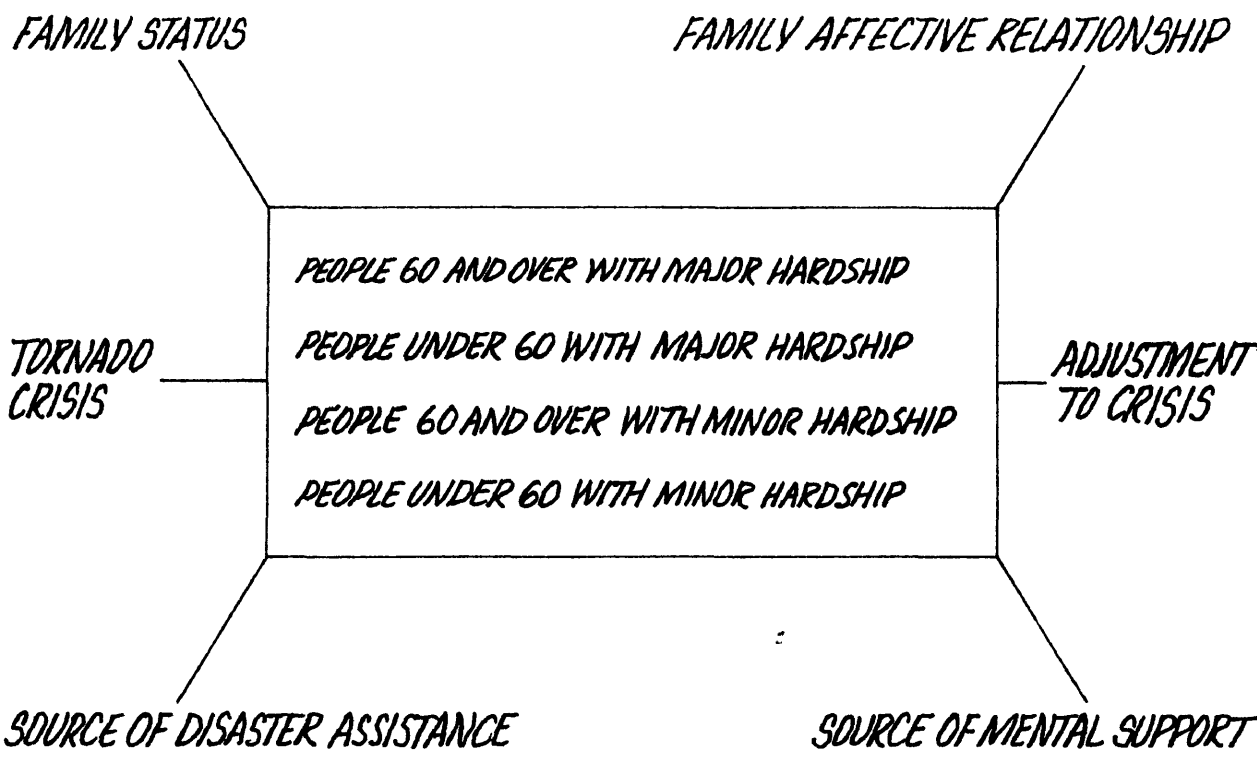


FIGURE 1: Thesis Model of Adjustment

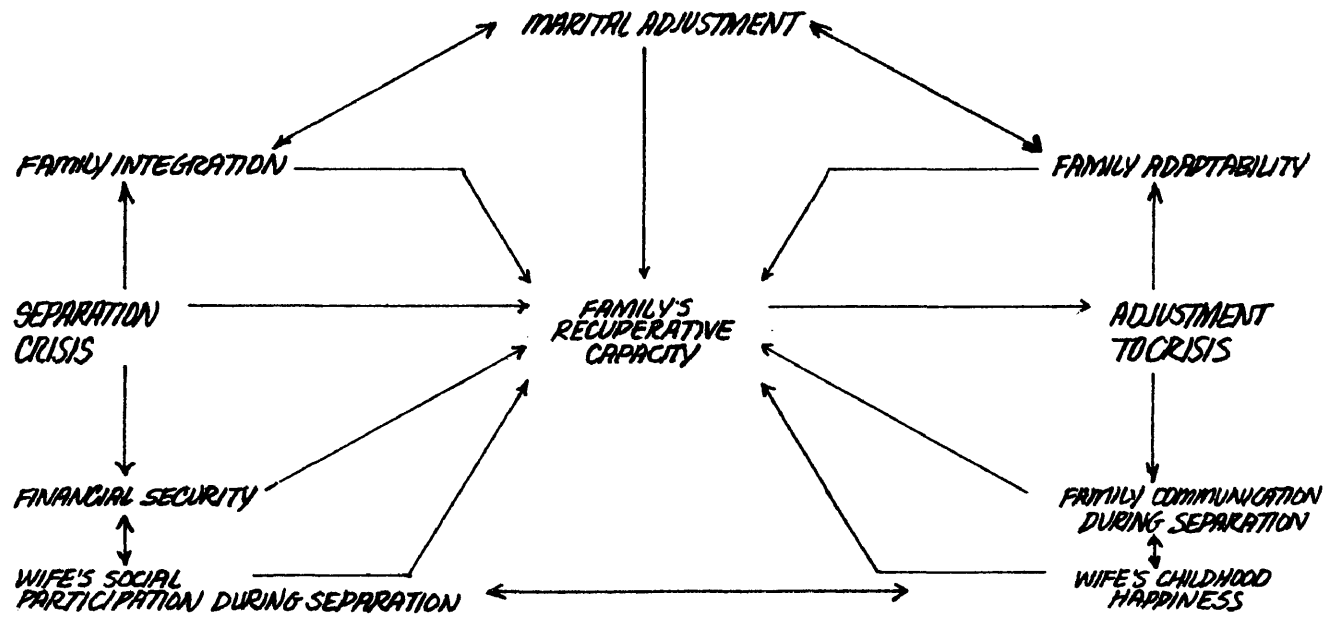


FIGURE 2: Hill's Adjustment Model

determinant factor which influences adjustment to a crisis. While in the thesis model, this capacity is further analyzed by the age of the individual respondent and by hardship experienced as a result of the tornado. Age and hardship were included because the review of the literature revealed (1) that older persons respond differently to the impact of a natural disaster and (2) that hardship may influence adjustment in disaster situations. One additional difference is that Hill's model applies to the stress brought about by war, while the thesis investigates adjustment necessitated by the occurrence of a tornado. An assumption is made that Hill's model of adjustment can be adapted to natural disaster situations.

Despite these differences, the thesis model generally replicates Hill's adjustment model in three ways. First, the survey respondents' families are hypothesized to be realigning their lives after the crisis. Second, different family variables are posited to have the power to influence recuperative capacity. And third, adjustment is postulated to be affected by recuperative capacity.

The thesis is therefore oriented toward the general adaptation and testing of Hill's adjustment model in a disaster situation; the use of the model is based on the importance of this model in the area, families under stress.

Hill's model represents one of the few attempts at theory building in this sociological area.

To test the thesis model of adjustment, seven hypotheses have been formulated; the first three hypotheses outline the proposed relationships between age, hardship and adjustment. These hypotheses are:

Hypothesis One: Victims age sixty and over will exhibit a more positive adjustment to disaster than victims under sixty.

Hypothesis Two: Victims who experience major hardship will adjust less positively to disaster than victims who experience minor hardship.

Hypothesis Three: Victims age sixty and over with minor hardship will adjust more positively to disaster than victims of other combined age and hardship categories.

The first hypothesis states that older persons will adjust better to natural disaster than persons under age sixty. This direction is based on the most recent findings regarding elderly adjustment following natural disasters (Cohen, 1976 and Bell et al., 1976) These research investigations specifically focusing on the elderly found that the older person fares as well as, if not better than, younger individuals. In contrast to these findings, studies of disasters previous to 1975 suggest that numerous handicaps will inhibit the recovery of the older person. The current

research is more methodologically oriented than the earlier research. Thus the first hypothesis is an attempt to test these recent findings.

The second hypothesis states the relationship of hardship to adjustment patterns. Since hardship has been infrequently investigated but often suggested as an important variable that affects adjustment, a test of this hypothesis will add data with which to judge this assumed relationship.

A combination of age and hardship is the independent variable in the third hypothesis. This combined variable's relationship to adjustment will be tested to determine whether any of the age and hardship categories relate uniquely to adjustment.

The last four hypotheses examine family recuperative-capacity functions. The functioning of the nuclear and extended family is tested by these hypotheses as related to adjustment patterns. The family-related hypotheses are stated below:

Hypothesis Four: Victims living with a family member will adjust more positively to a disaster than victims living alone.

Hypothesis Five: Those victims whose family relationships have improved since a disaster will adjust more positively than those victims whose family relationships have deteriorated or shown no change.

Hypothesis Six: Victims who receive a majority of their disaster relief from their families will adjust more positively to disaster than victims who receive the majority of their disaster relief from other sources.

Hypothesis Seven: Victims who receive most of their mental support after a disaster from their immediate families will adjust more positively than victims who receive most of their mental support from other sources.

Hypothesis four postulates differences to exist in adjustment patterns between single victims and victims living with at least one family member. The test of this hypothesis may reveal if the interpersonal support function of the family results in better adjustment for family member victims. On the other hand, if single victims, living alone, adjust as well as or better than victims who live with other nuclear family members, then it may follow that family support is less critical to adjustment. Adjustment may be the result of support from non-family individuals such as that given by formal disaster relief organizations or it may be tied to a measure of self-reliance on the part of each victim.

In the fifth hypothesis, adjustment is related to affective changes in family ties. Some of the questions to be answered by the testing of this hypothesis are: (1) Does a change for the better improve the possibility of

positive adjustment? (2) Does a change for the worse hinder the possibility of positive adjustment? Or (3) Is there a difference in adjustment between families whose relationships have changed and families whose relationships have not changed?

The effectiveness of the major source of disaster relief in terms of adjustment is examined in hypothesis six. Past research has pointed to friends and relatives as being the major source of disaster-relief assistance (Drabek and Key, 1975). This finding is retested by this hypothesis in relation to adjustment. Family, agency, and friend/neighbor disaster-relief support sources are compared to determine whether they similarly affect adjustment or whether relatives and friends provide more effective support (effective support meaning more positive adjustment than victims assisted by agencies).

Hypothesis seven compares three sources of mental support in relation to adjustment patterns. Since this type of support is similar to the described internal functioning of the nuclear family, sources are compared to determine if the immediate family most effectively provides mental support in terms of the most positive adjustment pattern.

Together the seven hypotheses represent the testing of the thesis model of adjustment. Impact on adjustment by

by the age and hardship variables and the family recuperative-capacity variables is determined. The previous findings and concepts that have been discussed in the presentation of the hypotheses are reviewed in detail by the following literature review.

REVIEW OF THE LITERATURE

One purpose of this thesis is to test the functioning of the family following a crisis situation, specifically the stress brought about by the impact of the Omaha tornado. Another purpose is to test adjustment to this crisis by elderly individuals. Many sociological texts, articles, and research endeavors have focused on differential aspects of this thesis inquiry. References from these publications will be reviewed in the areas of the nuclear family, the extended family, families under stress, family theory, stress, social gerontology and hardship.

The functions of the nuclear and extended family have been a significant subject area of family theory. Both are discussed beginning with theoretical references and ending with references of family functioning in disaster situations.

Families under stress is a relatively small area of family study as compared to the area of family functioning. This division of family sociology is reviewed in relation to systems analysis and the concept of equilibrium.

The state of theory covering family disaster study is examined. It is claimed that although many theoretical perspectives are available to this area of sociological

inquiry, no "adequate" theory has been developed.

Next, the literature on stress, social gerontology and hardship is examined. Stress, as it is used in the thesis, is defined in considerable detail. Finally, a discussion of the relationship of age and hardship to adjustment completes the literature review.

The Nuclear Family

A review of the literature covering the functions of the nuclear family¹ reveals a theoretical statement about the changes in family functions over time as a result of industrialization. This theoretical statement describes the change in the nature of the family from one of having multiple functions to the current status of one having a single combined function, which is interpersonal support and companionship. Burgess (1947:6), for example, comments that "the stability of the family depends less and less on economic and social factors and more and more in the interpersonal relationships of its members." Burgess and Locke (1960) focus their book, The Family, upon the theoretical premise that the family has changed. It no longer functions as an institution but as a center of companionship.

¹Nuclear family will be defined in this thesis as "parents and children (or) the smallest family type." This definition is from the Encyclopedia of Sociology (Adams et al., 1974:107).

Robert F. Winch (1952) in The Modern Family emphasizes the change in family functions over the last one-hundred years. One-hundred years ago, there were five basic family functions: economic, status-conferring, reproduction, socialization, and security-giving. In complex society today, the first three of these functions are less important to the individual family member. The last two functions, socialization and security-giving, have over time synthesized into one family function--the function of giving affection.

"Toward a Framework for Functional Analysis of Family Behavior" (Bell and Vogel, 1960) covers the nature of family functions. To reduce confusion, family functions are separated into two categories, external and internal. External functions are performed for other institutions or the wider society; internal functions benefit individual family members. The latter view of family internal functions places a heavy emphasis on Durkheim's analysis of group solidarity. Bell and Vogel (1960:24) state that Durkheim has shown that "solidarity gives members the motivation to abide by norms."

With a great deal of solidarity, obligations may be felt as natural or not even felt as obligations. In addition, feelings of solidarity are very important in dealing with individual tensions and personality problems. Over a long period of time the meeting of expectations leads to a feeling of faithfulness which adds to solidarity. (Bell and Vogel, 1960:24)

Donald Hansen and Reuben Hill (1964:805) add that family functioning should be seen in light of its capaci-

ties and resources for individual family members;

The family today is not only the focal point of frustration and tension, but also the source for resolving frustrations and releasing tensions. In our society, individuals hope that their family will show great capacity of sympathy, understanding, and unlimited support, and thus act as emotional therapy for personalities bruised in the course of competitive daily functioning.

A review of theoretical perspectives of the family in an industrial society points to the conclusion that interpersonal support is the basic internal function of today's family. Support of the individual family member is provided through frustration and tension resolution, companionship, affection-giving, integration, and solidarity.

The family in a crisis situation is a natural testing ground for the analysis of family functional strengths and weaknesses. Tensions and dynamics which are normally hidden can be discovered and recorded. One of the chief counter-acting forces to the after-effects of a disaster could be the strengthening of family bonds (Baker and Chapman, 1962:129; Hill and Hansen, 1962:191).

The Extended Family

The difference between nuclear and extended family support is another aspect of family functioning.² Past theoretical speculation has centered around the relation-

²Extended family will be defined in this thesis as relatives who have maintained ties with the nuclear family.

ship of the extended family to the nuclear family. Talcott Parsons (1959) views family structure as isolated and nuclear, maintaining that this is the only functional type of family structure in an industrial society. This conclusion is based on the societal pressures of increased geographic and social mobility. Contrary to Parson's theory, Sussman (1953 and 1960) and Litwak (1960A and 1960B) have found the extended family to be a viable resource to the nuclear family, and their research documents that the extended family has surpassed the barriers of geographic and social mobility.

Sussman (1965:63) in particular stresses the importance of pursuing the function, meaning and significance of kin network activities:

There exists in modern, urban, industrial societies, particularly in American society, an extended kin family system, highly integrated within a network of social relationships and mutual assistance, that operates along bilateral kin lines and vertically over generations. Now we must...determine the meaning and significance of these activities.

Disaster research has investigated the function, meaning and significance of the support given to the victim family from the extended family. The following findings show the importance of such support and the slower recovery patterns of the victim family when such support is missing:

1. The extended family has been found to be the major source to which the disaster victim turns for help (Quarantelli, 1960:263).

2. The immediate and extended family may form the first line of defense against tornado-related mental distress (Wallace 1956:129).

3. The largest proportion of tornado victims studied by Drabek and Key (1975) received aid from relatives and friends.

4. In a study of war separation (Hill, 1949:340) it was found that families who adjusted least well or most slowly had a history of mobility and tenuous relationships with relatives, while "families which succeeded best in meeting the crisis of war time made frequent mention of the accessibility of relatives, neighbors and friends." It is important to note that family agencies, churches and welfare groups were rarely mentioned as support sources. As a result of these findings, Hansen and Hill (1964:797) conclude that "in any type of community...the extended family may offer more intense therapy to families under stress than any other element of society."

These findings cover the long range disaster-assistance function of the extended family. But immediately after the impact of a disaster a different type of family behavior occurs. At this time there is no distinction between nuclear and extended victim families because they act as one unit and their behavior is similar (Baker and Chapman, 1962 and Barton 1969).

In a qualitative analysis of the effect of the Beecher tornado (Form and Nosow, 1958) it was found that concern for the fate of family members affected the individual victim's sense of security and the basic ability to become involved in emergency operations. For example, firemen accepted their assigned role of community disaster assistance only after determining the fate of their families. Generally it was found that:

Immediately after the tornado hit Beecher...the initial definitions of the residents of what behavior was necessary ...included activities of looking for and aiding those who were of most concern to them, i.e., family members, friends and relatives (Form and Nosow, 1958:62).

Baker and Chapman (1962:129) comment that all disaster research accounts that they reviewed "stress the significance of family ties, the vigorous searching behavior of separated family members, and the heightened interaction and solidarity within the family". And what appears to be individuals who are disoriented and in shock as they flee from a disaster, are family units whose members rarely panic as they flee in a group. Their behavior may be a rational effort to find missing members (Hansen and Hill, 1964:807, Quarantelli as referenced in Hill and Hansen, 1962:188 and Baker and Chapman, 1972:232).

Not only are family members in the immediate disaster area affected by this searching behavior, members of potential victim family members outside the disaster area also become involved in the searching activity when they learn

of the disaster through the mass media. They can search to learn of the fate of their families through the use of a telephone. Often the number of telephone calls is so great (as happened after the Omaha tornado) that the telephone company must request that only emergency calls be connected.

Families Under Stress

The sources of stress to a family are generally placed into two categories—internal and external stress (Hansen and Hill, 1964). "Internal stress" is related to disruptions caused within the family that tax their relationships. Examples of "internal stress" are such situations as a divorce leaving children with one parent, a juvenile delinquent child or a daughter who is about to become an unwed mother. "External stress," which is the basis of this thesis, refers to stress from outside the family which taxes the family system. "External stress" examples are natural disasters, wars, and economic impoverishment.

Much has been written about the family under external stress from the theoretical perspectives of system analysis and equilibrium. The interaction of the individuals within the family unit operationally composes the system. This perspective is analytically different from viewing individuals acting for themselves only with no system bonds. Drabek et al. (1973) found the perspective of open system anal-

ysis the most applicable approach to his study of the longitudinal impact of the Topeka tornado on family functioning.

In discussing the concept of "system" in family stress research, Hansen and Hill (1964:787) state that "re-equilibration" is one of the essential aspects of the system. "Re-equilibration" refers to a process where a system disturbed by an internal or external stress works in mutual interaction to return to a steady state. The description of re-equilibration is similar to the theoretical approach of functionalism. The basic difference between the two is that re-equilibration in this case is limited to the family system while functionalism often describes society as a whole. Both focus on the maintenance of a steady state rather than on social change. In the case of natural disasters the system is working to regain a past state of equilibrium. Analysis in both is based in terms of the specific functions which support system maintenance. This tie to functionalism is illustrated by Hansen and Hill's (1964:788) comment that:

Case after case demonstrates that re-equilibration is a common, apparently automatic process following disturbance of a family structure. Disaster research indicated that not only families but entire communities (or the injured parts) tend to dynamic reaction following a tragedy, until the major shared problems have been overcome, and a new set of solutions has been found.

These patterns toward a steady state can also be seen in the social psychological concepts of cognitive dissonance and balance theory. For example, the concept of cognitive

dissonance can be seen in Festinger's (1957) conformity studies, where deviants are pressured toward conformity. Under balance theory, attitudes toward objects and persons are posited to have positive and negative valances. Movement in a conflict situation between balances is always toward a balanced state (Heider, 1958).

Relative deprivation is another concept which might be used to illuminate the situation of the victim family. Families suffering from an external stress are responding to the impact of the disaster on their lives in comparison to their former state of existence (Bates, 1963).

The process of regaining equilibrium by the family system has been well documented by Bell and Vogel (1960), Hansen and Hill (1964) and Parad and Chapman (1960). The motive of the family suffering from the disaster-related stress is the prevention of group disintegration:

The family appears to have a certain level of tension tolerance. When tensions become so severe as to threaten the group with disintegration, there is often a sudden rallying of forces to unite the family by dealing with the threat of the family solidarity. These family coping mechanisms operate in ways very similar to personality mechanisms (Bell and Vogel, 1960:26).

Hansen and Hill (1964) more vividly describe this process of recovery as a "roller coaster profile of adjustment." Hill (1949:809) originally initiated this profile to illustrate the process of reaction to a crisis. Hill found that there were many patterns of successful adjustment

to the crises of families separated by war. Generally the majority of families followed a "roller-coaster" profile beginning with disorganization and ending with readjustment. In this profile (see Figure 3), stress leads to disorganization, which leads to a recovery effort, which, in turn, results in reorganization.

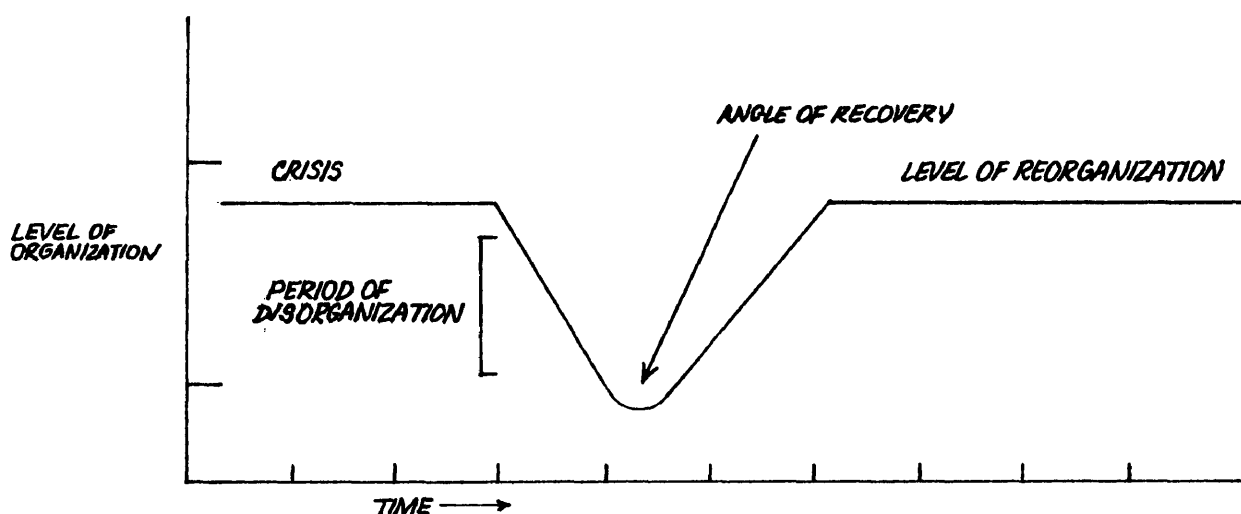


FIGURE 3: Roller-Coaster Profile of Adjustment

Hansen and Hill (1964:809) describe the "roller-coaster" concept of readjustment:

As a result of meeting stress, family members are collectively numbed by the blow. They meet friends at first, as if the blow had not fallen: then, as the facts are assimilated, organization slumps, roles are played with less enthusiasm, resentments are smothered or expressed, conflicts develop or are converted into tensions that strain relations. As the nadir of disorganization is reached, things begin to improve, new routines are arrived at by trial and error or by thoughtful planning, and some minimum agreements about the future are reached.

Parad and Chapman (1960) in their article "A Frame-

work for "Studying Families in Crisis" also view the situation of crisis in relation to the concept of "re-equilibration." They see the crisis as overpowering the normal problem solving mechanisms of a family, thus forcing the family to initiate behavioral patterns unlike those of the past in the process of crisis resolution.

Not only do disaster-impacted families reach a readjustment stage, but they may emerge as stronger units. Drabek, et al. (1973) found that three years after the Topeka tornado victims were more healthy, physically and emotionally, than the control victims, as indicated by variables testing hopelessness, despair and deteriorated health.

Family Disaster Theory

Theory has not been "adequately" developed in family disaster research as is evidenced by the following statements:

1. Grosser (1964:318) comments that

No one subject, such as the family in disaster or the effects of disaster on mental health, has been systematically studied to the point where we have valid answers for a range of related questions on the topic.

2. Hansen and Hill (1964:815) concur by saying that

No one conceptual framework so far evident in the study of families under stress boasts the conceptual development necessary to meet the varied problems of personality, family as a unity or system, community or society...At most the concepts of system and equilibrium offer a theoretical perspective from which to view families under stress. Rarely have the descriptions of such families risen toward

the general or middle ranged theory. Instead disaster family research findings remain as isolated hypotheses.

3. Hansen and Hill (1964) point to the fact that findings related to the family in a disaster situation with possible theoretical significance are accumulated over many fields of academia, further complicating the problem. These fields are sociology, psychology, medicine, psychiatry, and social work.

4. Drabek and Key (1972:abstract) lament the lack of general theory with which to integrate existing data, to systematically guide new research, and to stimulate the development of a network of theoretical models whereby families as special types of social systems might be understood.

5. Ernest Burgess (1947:4) in "The Family and Sociological Research" comments that "the area of conflicts, crises and accommodations in marriage and family life has... only partially been developed".

6. One final broad point that covers more than the area of family is made by Robert K. Merton in a preface written for Allen Barton's comprehensive review of Communities in Disaster (1969:xxvii). Merton states that "sociological theory has yet to be found which ties together the regularities discovered after a disaster." This thesis will attempt to build upon the work begun by Hill (1949) in his model of adjustment (Figure 1), thus, potentially, helping in the inductive process of theory building in the area of the

family impacted by disaster.

Stress

The concept of stress needs to be elaborated upon and defined before it can be appreciated in the context of the present thesis. Stress is a difficult concept to define. In research, stress has been used as both a stimulus and response variable. Often its symptoms are few, yet its presence is assumed.

Irving Janis (1958: 11-13) proposes that stress be used to refer to the stimulus condition rather than to the affective response. In Psychological Stress he comments that there is no generally agreed-upon definition of stress. But there is a high degree of consensus as to the domain within which the term applies. This domain includes extreme environmental stimuli which trigger the adjustive capacities of an organism. A counter argument to the Janis definition is that the stressor or cause has often been measured in research instead of appropriately measuring the stress itself-- the individual's reaction to the stressor (Levi 1967).

Evidence that stress actually results from disaster is noted by Killian (1954), Barton (1969) and Baker and Chapman (1962). They all point to physical and mental stress exhibited after natural disasters. Killian (1954:68)

states that "severe emotional disturbances are relatively infrequent in disasters, but psychosomatic aftereffects are almost universal." Barton (1969:80) in his sociological analysis of a stress situation, Communities in Disaster, found a close correlation between assumed degree of stress and the incidence of physical reactions like upset stomachs and headaches. Baker and Chapman (1926:17) in Man and Disaster in Society describe the "disaster syndrome" as a stunned condition, slow reactions and passive suggestibility.

Although stress has been observed after natural disasters, the concept will be conceptually viewed in this thesis as the disaster event and not the resulting behavior observed after disasters. The tornado, or the stress agent, precipitates adjustments by individuals or family units. This view of stress as the "stressor" to the system is consistent with equilibrium or balance theory and it is the traditional conceptualization of this term as it has been used in disaster research. Several social and psychological theories treat the adaptive response as a central concern. This is especially true of balance theory.

Community and family disaster research has traditionally used stress as the stimulus element. The "system" is depicted as being in a state or condition that is responding or adapting to the stress stimuli (Haas and Drabek, 1970). The present thesis incorporates this research per-

spective in that the Omaha tornado is viewed as an external disruption of an individual's or family's life. The disruption results in a variety of adaptive responses that represent attempts at life realignment.

Social Gerontology

A review of social gerontology relating to the older person in disaster situations reveals: (1) the suggestion that two handicaps may slow the adjustment process of the elderly, one due to the process of aging and the second resulting from the impact of natural disasters, (2) evidence that older persons react with substantially different behavior patterns to the impact of a disaster, and that (3) long-term adjustment of the elderly may be better than similar adjustment of younger persons.

Two different kinds of handicaps have been described in the disaster literature which may hypothetically influence the older person's adjustment to disaster. The first type is inherent in the aging process. They exist in a greater proportion within the over-sixty population. Examples of the first type of handicap are limited financial resources, chronic illness, multiple illnesses and physical handicaps (Cohen, 1976 and Bell et al., 1976). The second occurs as a result of a disaster. These handicaps are behavioral patterns associated with the disaster. The second handicap is illustrated by an extensive analysis of

disaster research that selectively reviewed findings about the elderly. This report, "Natural Disasters and the Elderly: A Preliminary Report of Research Efforts, Need Review and Implementation" (Bell 1975), found that:

1. The elderly are often outside warning networks such as civil defense sirens and informal networks of relatives.

2. People over sixty are less willing to evacuate from the area that has been hit by a natural disaster. This may be due to an attachment to familiar surroundings and a lack of resources.

3. Older individuals seem to suffer the most property loss after natural disasters.

4. After a disaster, the elderly are less willing to accept aid.

5. Old people respond in a slower fashion during the initial recovery periods.

The observation that old people initially respond in a slower fashion than other adults was a conclusion of two of the first research articles that focused specifically on the elderly following a natural disaster (Friedsam, 1961,1962). A relatively high sense of deprivation regarding losses after the occurrence of a hurricane was a reaction found to be characteristic of the older victims (Friedsam, 1961). The elderly were also more frequently found to be pre-occu-

plied with the disorganization and the reorganization of their lives (Friedsam, 1962). These conclusions were based on data collected from a secondary analysis of interviews conducted with victims immediately following the impact of this disaster. One weakness of these described characteristics is that the age of the victim was not asked in the original interviews; thus age had to be determined from information contained in the statements of the victims.

Other findings concern the unproportionately low amount of service assistance that the elderly receive following natural disasters, although these findings may be tied to the reluctance to accept aid. After the Topeka tornado, it was found that the elderly, ethnic, and low socio-economic status individuals frequently received less aid (Drabek and Key, 1975). In Omaha the elderly received significantly less available disaster-relief than an under-age sixty sample of victims (Kara, 1976A).

In an attempt to determine the special assistance needs of the elderly in Omaha following the tornado, service providers were interviewed. These service providers described the special problems that they had encountered while assisting older victims. Generally, these agency representatives reported that the elderly (Kara, 1976B and 1976C):

1. were reluctant to accept services,
2. recovered at a slower rate,

3. needed to talk more about their disaster experience,
4. were inexperienced in dealing with bureaucracies,
5. avoided programs with a welfare image,
6. were unwilling to move to mass shelters that afford little or no privacy, and
7. were assisted by their families for a relatively short period of time.

To sum up, the second handicap which may inhibit adjustment is the elderly's acceptance of less disaster relief and their differential patterns of recovery. Whether or not this handicap or the first described affect adjustment has only recently been researched.

The possible impact of handicaps and differential adjustment was studied by Elias Cohen (1975) after the Wilkes-Barre flood. Cohen started his investigation with the belief that for the reasons just described, the older victim would not recover as well as victims who were younger. But his results indicated that the elderly have a high natural resiliency under stressful and adverse conditions. Indicators of adjustment that were used included numerous comparisons of the individuals' lives before the tornado as compared to their lives after the tornado along such variables as health, satisfaction, etc. It is claimed that older people may have adjusted better than younger people after the flood. Unfortunately, the research does not

include a sample of younger adults. Thus, it is difficult to compare these age groups in terms of adjustment.

Hardship

The inclusion of hardship as an independent variable is suggested in disaster and crisis literature by Reuben Hill and H. J. Friedsam. Both writers stress the importance of the use of this variable in the study of recovery patterns. In the conclusion of the book, Families Under Stress, Hill (1949) states that adjustment to crisis must be considered relative to the number of hardships involved in the situation. Friedsam in "Older Persons in Disaster" (1962) suggests that one should investigate differences in reaction to disaster by varying degrees of hardship. Although the case for investigating hardship is not as sound as the case for the other thesis variables, it is an important research concern. Information collected will add hard data to the speculation that hardship affects recovery patterns.

The specific operationalization of hardship for this thesis is discussed in the following methodology section, as is the inter-relationships of variables including hardship and the general research design.

METHODOLOGY

The thesis research is complicated by the fact that the variables tested were collected under the research methodology utilized by the "larger Gerontology Program study". Therefore it is necessary to describe the research design, sampling procedures, and data collection process used by this study. Then the thesis method of analysis can be explained. This involves the variable operationalization and inter-relationships.

The research design used for this thesis was developed for the study of services utilized by the elderly following the Omaha tornado (Bell et al., 1976). This design incorporated the use of both experimental and control samples. Two-hundred tornado victims comprised the experimental sample and one-hundred non-victims made up the control sample (see Figure 4). Totally, three-hundred persons were interviewed in this investigation.

<i>TORNADO VICTIMS</i>	<i>CONTROL PERSONS</i>
<i>N=200</i>	<i>N=100</i>

FIGURE 4: Composition of the Samples

In addition to the inclusion of a non-victim control sample, an age control was also designed so that the special service needs of older individuals could be determined. Age sixty was the dividing point between these two cohorts, with people under sixty comprising the first cohort, and individuals age sixty and over comprising the second. Also within the victim sample a special effort was made to interview equal numbers of people who had experienced major and minor damage to their homes as a result of the tornado. Figure 5 depicts the intended age and damage distribution of the victim and control samples.

	<i>VICTIM</i>		<i>CONTROL</i>
<i>AGE</i>	<i>MINOR DAMAGE</i>	<i>MAJOR DAMAGE</i>	
<i>18-59</i>	<i>N=50</i>	<i>N=50</i>	<i>N=50</i>
<i>60 AND OVER</i>	<i>N=50</i>	<i>N=50</i>	<i>N=50</i>

FIGURE 5: Intended Age and Hardship Distribution of the Samples

Because the research design included non-victim and age controls, the research can be considered of a quasi-experimental character. Due to the unpredictable nature of disasters, it is almost impossible to conduct pre-tests with future victims. Thus human disaster research will nearly

always follow this pattern.

To implement the research design, sampling procedures were established which lead to an attempt to delineate for the victim sample the total universe of every residence hit by the tornado, while the control sample was selected by comparing blocks hit by the tornado to blocks in Omaha that had not been affected. When the closest possible match of "criterion characteristics" was found between the victim and the control blocks, interviewers were sent into the matching control blocks to collect interviews. The following paragraphs explain respectively the procedures used to sample the victim and the non-victim control sample respondents.

The information used as the basis of the systematic selection of the victims was collected from several data sources. The primary source of information was a report compiled by the Omaha Police Department. Immediately after the tornado, the police department conducted a door to door canvass of the damaged area of Omaha, Nebraska. Their report listed the address of property units damaged with an occupants' name for each residential unit. The investigating officer also made a subjective assessment of the extent of damage to each residential unit.

The data from this report were used as the basis of a card file. Each card in the file was compiled by listing

the address of the damaged residential unit and indicating the resident to whom the police had talked. Then, each card was crosschecked with the information contained in the most recent city directory, telephone books, and voter registration records. Such a procedure added to the reliability of victim sources.

After all possible information had been collected from these available sources, each completed card contained: (1) the disaster-affected residential unit, (2) known residents of the household, (3) the ages of the residents, (4) the current address of the victims, (5) the current telephone number of the victims and (6) an assessment of damage to the residential unit.

Damage was divided into two categories, minor and moderate/heavy. The police department report describing damage to each residential unit was used to make the damage category determination.

The only problem encountered in the creation of the card file involved Sarpy County, Nebraska. A small portion of this county suffered minor damage from the tornado. The police report had covered only property within the city of Omaha. Fortunately, the Omaha Planning Department developed a photographic map of every block that had been impacted by the tornado. This map included the damaged area of Sarpy County. By obtaining a copy of this map, all

the homes that were indicated as having suffered minor damage in Sarpy County, were added to the victim sample card file.

When the card file was completed, the cards were divided into the victim sampling cell categories. The victim sampling cell categories were: (1) victims sixty years of age and over who had suffered major damage, (2) victims sixty years of age and over who experienced minor damage, (3) victims under age sixty who suffered major damage, and (4) victims under age sixty who experienced minor damage. This left two remaining victim sampling cell categories: (5) victims of unknown age who suffered major damage and (6) victims of unknown age who suffered minor damage. Figure 6 depicts the six sampling cells that were used to select victims to be interviewed.

	<i>AGE 60 AND OVER</i>	<i>AGE 21-59</i>	<i>AGE UNKNOWN</i>
<i>MAJOR DAMAGE</i>	1	3	5
<i>MINOR DAMAGE</i>	2	4	6

FIGURE 6: Victim Sampling Cells

After the cards were divided into the six cell categories, they were used as the basis of three systematic sampling selections. These selections were made to determine which victims would be contacted for an interview. Three drawings from the hypothetically complete universe of victim households was necessitated by the unexpectedly high interview denial rate. In all, interviewers attempted to reach 614 victims of the Omaha tornado. Two hundred victims agreed to an interview; thus the interview response rate was 32.7%. Because this low response rate was not initially anticipated, victims to be interviewed were systematically drawn from the victim sampling cell categories as needed.

The attempt to equally sample the victims of the tornado in the intended age and hardship cohorts was only partly successful. In the victim sample, 61% are adults under the age of sixty and 39% are adults sixty years of age and over. On the other hand, the attempt was successful in the control sample, where fifty percent of the sample fell in each age cohort.

The attempt to stratify the victim sample by degree of damage was also successful. The Characteristics of the Victim Sample, Appendix I, shows that 48% of this sample suffered minor home damage as compared to 50% which suffered major damage to their homes. The fairly even distribution of degree of damage was expected because, in contrast to age,

each card used for the systematic sampling had an indication of the degree of residential damage. Appendix I may also be consulted for a discussion of all the survey items that could have been used to determine hardship.

The sampling of the control respondents was determined by matching tornado damaged census block groups with non-damaged Omaha census block groups.¹ Data used as the basis of this match were derived from the 1970 U. S. Census Tapes. The "criterion characteristics" used to determine the similarity of block groups included: (1) median home value, (2) percentage of the population over age sixty-five, and (3) racial composition. A matching block group was selected for each tornado-damaged block group. It was within these block groups that the control interviewing took place.

Control interviews were obtained by sending interviewers into the matching block groups. These interviewers were given detailed instructions that included a map of the area where interviews were to be obtained, a point of where to begin interviewing, the direction to move in after the first interview and a request to interview every third household. In addition to these instructions, the interviewers were asked to interview set numbers of people according to their age. The refusal rate for the control

¹A block group is the smallest geographic unit used by the U. S. Bureau of the Census.

interviews is not known.

Victim interviews were determined through selection by a systematic sampling procedure. After victims were selected to be interviewed, they were immediately mailed a letter that described the nature of the research. The letter also indicated that an interviewer would contact them shortly to arrange a convenient date and time for the interview.

All interviewers received training on how to conduct an interview. The entire interview was covered page by page and difficult questions were covered in depth. Special interviewing techniques were outlined such as how to conduct an interview with persons who have hearing or vision problems.

Interviewing began early in December of 1975, approximately seven months after the tornado, and it was completed in March of 1976, eleven months following the impact of the disaster. Four months passed during the interviewing stage of the research investigation.

Interviewing was a relatively long process for two reasons. First, the victim interview contained 213 questions, and many of these questions involved multiple responses. Informal reports from the interviewers indicated that the victim interview schedule took an average of two hours to administer. The control interview was considerably shorter, and it was estimated that the average control schedule took an hour to administer. The length of the interviews was

considered a problem in that the victim interviews had to be scheduled for an entire morning, afternoon or evening. This limited the victim interviews that could be conducted in one day. The second source of delay was that the interviewers were volunteers in the sense that they were paid only a token amount for each interview. Because of the low pay, most of the interviewers quit after administering one to five interviews. This high interviewer drop-out rate constantly required the recruitment and training of new persons to do interviewing.

As a result of the length of the interviews and the low rate of interviewer pay which led to a high interviewer drop-out rate, the anticipated collection time for interviews was lengthened. It was expected that interviews could be collected in two months when actually it took four months to accomplish this task.

Despite delays, all three hundred interviews were collected. These interviews were used as a basis of the thesis research, the method of analysis for which is described below by independent, dependent and intervening variables. The variables are operationalized and their inter-relationships within the postulated model of adjustment are explained.

Independent Variables, Hypotheses One Through Three

Age and hardship were the independent variables in the

thesis model of adjustment. These variables were assigned independent variable status based on the findings in the review of the literature which revealed that dependent on age, behavioral response to the tornados differs. Also in this review hardship was suggested as a possible factor influencing natural disaster adjustment.

In the first hypothesis age was a dichotomous variable. Two age cohorts were compared. The first is represented by adults who are at least twenty-one years of age but not older than fifty-nine. The second is comprised of individuals who are sixty years of age and over. Data used to form the age cohorts were obtained from survey Item 11.²

Hardship, as operationalized in hypothesis two, is a dichotomous variable. Two hardship cohorts were created for the purposes of comparison (based on data collected in survey Item 37). These cohorts are based on the degree of damage that the respondents reported having experienced as a result of the tornado. The "major hardship" cohort consists of victims whose homes were totally destroyed or so badly damaged that they were required to move out while repairs were being made. The "minor hardship" cohort contains victims who reported minor damage and thus were able to remain in their homes while repairs were being made.

²Appendix II contains all the survey items used in the thesis research.

For Hypothesis Three, the operationalized age and hardship cohorts were combined. There were four cohorts in this ordinal variable: (1) victims sixty and over who experienced major hardship, (2) victims under age sixty who experienced major hardship, (3) victims sixty and over who experienced minor hardship, and (4) victims under age sixty who experienced minor hardship.

Dependent Variables, Hypotheses One through Seven

The dependent variables were represented by four dimensional aspects of adjustment. The term "dimensional" was used because while the four chosen variables reflect various aspects or dimensions of adjustment, they do not adequately represent how well an individual or family unit adjusted to the impact of disaster. For example, adjustment could have been measured by additional psychological, sociological or health measures such as indicators of anxiety, relationship changes with friends and neighbors or changes in the health of the respondent.

Adjustment was selected as the dependent variable in the thesis model because the review of the literature suggests that it is dependent upon age, hardship and family recuperative functioning (Cohen, 1976, Drabek et al., 1973, and Hill, 1949). These studies, which employed adjustment as the dependent variable, investigated respectively family stress caused by a flood, a tornado, and war separation.

The dimensional adjustment variables represented perception and attitudes toward resettlement and life satisfaction. Three of these variables were similar in that they survey satisfaction with or perception of resettlement progress. Survey Item 50 questioned satisfaction with progress toward resettlement. Survey Item 51 asked victims to compare their resettlement progress to other victims. And survey Item 52 surveyed expected satisfaction when resettled. The first and third offered the victims the opportunity to state whether they were already resettled. The fourth survey item (135) was unique in that it represented the victim's life satisfaction.

Adjustment was considered positive if the victim was satisfied with progress toward resettlement, was progressing in resettlement better than other victims, expected to be satisfied when resettled or was satisfied with life. Each adjustment variable was compared individually to the independent and intervening variables.

Intervening Variables, Hypotheses Four through Seven

The intervening variables in the model were tested by hypotheses four, five, six, and seven. These variables centered on the family in that they may provide evidence of

³The term "dimensional adjustment" will be used throughout the remainder of the thesis as a reminder that these variables represent limited aspects of adjustment.

family support functioning. These hypotheses treat the intervening variables as independent variables because it was not possible to test these variables in their originally postulated intervening role. As seen in the findings section, when these variables are taken against dimensional adjustment, often the expected frequencies are lower than those required for the Chi-square test. Thus it would be inadvisable to further break down or lower cell sizes by introducing the originally postulated independent variables into the tests between the intervening and dependent variables.

Four family variables are tested by the intervening variables—family status, family affective relationship, major source of disaster relief, and major source of mental support. Family status categories were compared by hypothesis four to determine if adjustment was uniquely affected by living alone or living with family members. In hypothesis five, the possibility of differences in adjustment was examined against families whose affective relationship had "improved," "deteriorated" or "not changed" since the tornado. Major sources of disaster relief were compared in the sixth hypothesis to see if family support produced the most positive adjustment. And adjustment patterns were compared against the major source on mental support in hypothesis seven.

In hypothesis four, the family status variable was comprised of survey Items 140, 3, 4, 5, and 6. It is a dichotomous variable that is divided into (1) "single" victims and (2) victims who are living with one or more nuclear family members. "Single" victims were respondents who lived by themselves.

Family affective relationship was examined by hypothesis five. This is a nominal variable which was measured by survey Item 54. Families whose relationships have changed for the better since the tornado were labeled as having "improved", while respondents who label their family relationships as less satisfactory since the tornado were labeled as having a "deteriorated" relationship. The final category consisted of victims whose family affective relationships had experienced "no change." The definition of the term "family" in this survey item was left to the self-definition of the respondent.

The source categories of disaster-relief in hypothesis six were ordinal, in contrast to the nominal level of the other intervening variables, in that they compare the greatest percentage of assistance given across five categories: (1) loans, cash assistance, and grants, (2) furniture, (3) clothing, (4) food, and (5) temporary housing. The three source categories were immediate family and relatives, community disaster agencies, and friends and neighbors. This

family variable was measured by survey Items 199-203. The definitions of the assistance sources were left to the self-definition of the individual respondents.

The seventh hypothesis compared mental support provided by the extended family and others in relation to adjustment patterns. Family living in the household was labeled as "immediate family" while family living outside the household was labeled as "extended family." The "others" category includes friends, neighbors, priest, doctor, etc. "Mental support" related to a part of the survey question, Item 204, which asked "who did you receive the most support from...support in the sense of helping you attain a sense of direction." This variable was considered ordinal because the answer to Item 204 was the person from whom the victim received the most support.

The family variables were considered intervening because in the postulated model they have the capacity to strengthen, negate or not influence the relationship between the independent and dependent variables. Although for the reasons just explained, these intervening variables had to be considered independent and are thus treated as such in hypotheses four through seven. The results of the testing of these hypotheses and the first three hypotheses are revealed in the following findings section.

FINDINGS

This section represents a review and analysis of the testing of the hypotheses. Each hypothesis is first stated in its null (H_0) and alternate (H_A) forms. Then secondly the hypothesis is examined to determine whether or not it can be rejected in its null form or supported in its alternate form. This determination is based on the data and statistics presented in the table which accompanies each set of hypotheses (H_0 and H_A). These tables display the variables, data and statistical tests under consideration. Chi-square statistics are cited and where they are significant at the .05 level, the Kendall's Tau measure of association is provided.

Hypothesis One

H_{01} No difference in adjustment after a natural disaster will exist between victims under age sixty and victims age sixty and over.

H_{A1} Victims age sixty and over will exhibit a more positive adjustment to disaster than victims under sixty.

H_{A1} suggests a direct relationship between the age of the victim and dimensional adjustment. But, as seen in Table I, statistically different relationships are not found to exist between the age cohorts. Because the significance levels of Chi-square are, in all cases, greater than .05, H_{01} is not rejected.

TABLE I
AGE CROSSTABULATED BY THE DIMENSIONAL ADJUSTMENT VARIABLES

Survey Item Number	Adjustment Variable Question / Response	Age of Victim			
		Under 60 No.	60 (%)	60 and over No.	over (%)
50	Satisfaction with progress toward resettlement				
	Dissatisfied	12	16%	6	15%
	Satisfied	64	84%	35	85%
	Subtotal n=115	76	100%	41	100%
	Chi-square=.01 Significance Level=.92				
	Resettled	37	33% ^a	29	41% ^a
	Total N=183	113		70	
51	Resettlement progress in comparison to other victims				
	Worse	12	10%	7	10%
	Average	45	39%	28	38%
	Better	59	51%	39	53%
	Total N=190	116	100%	74	101% ^b
	Chi-square=.07 Significance Level=.96				
52	Expected satisfaction when resettled				
	Less	20	25%	10	24%
	Average	37	46%	24	57%
	More	23	29%	8	19%
	Subtotal n=122	80	100%	42	100%
	Chi-square=1.69 Significance Level=.43				
	Resettled	41	34% ^a	33	44% ^a
	Total N=196	121		75	

TABLE I—Continued

Survey Item Number	Adjustment Variable Question / Response	Age of Victim			
		Under 60		60 and Over	
		No.	(%)	No.	(%)
135	Life satisfaction				
	Not satisfied	7	6%	4	5%
	Satisfied	116	94%	73	95%
	Total N=200	123	100%	77	100%
	Chi-square=.03				
	Significance				
	Level=.87				

^aThe resettlement percentage is calculated in terms of the percent of the total number of persons who responded to this survey item.

^bSubtotal or total percentages may be greater or less than 100% due to rounding error.

Although the alternate hypothesis is not supported, it is interesting to note directional tendencies relating to age can be observed both in expected satisfaction of the victim when resettled and in resettlement patterns. In Item 52 it can be seen that a greater percentage of elderly victims expect only "average" satisfaction when resettled, while respondents under age sixty tended to expect "more" satisfaction when resettled (neither exhibits greater than a ten percent difference between age cohorts). Even though fewer older victims expected to be "more" satisfied when resettled, they are resettled at a higher percentage, forty-four percent as compared to thirty-four percent of those under sixty, Item 52. Taken together these tendencies are not of major significance.

Hypothesis Two

H_{O_2} No difference in adjustment to a natural disaster will exist between victims who experienced major or minor hardship.

H_{A_2} Victims who experience major hardship will adjust less positively to disaster than victims who experience minor hardship.

H_{A_2} postulates a relationship between dimensional adjustment and extent of hardship suffered. Victims who experienced major hardship are expected to adjust less positively after a disaster than victims who experienced minor hardship.

The predicted relationship of H_{A_2} was significant in

one instance only. Hardship is significantly related to adjustment only as it is measured in terms of perceived progress toward resettlement, Item 51. Thirty-six percent of victims who experienced major tornado-related hardship perceive "better than average" progress toward resettlement compared to sixty-six percent of victims with minor hardship ($\chi^2=17.5$, $p < .05$; $r=.11$, $p < .05$). Hardship is not significantly related when adjustment is measured as dimensions of satisfaction, Items 50, 52, and 135. It appears from these items that although respondents who suffered minor hardship from the tornado perceive that they have made greater steps toward recovery by the time of the survey, they are no more satisfied with their recovery than those who suffered major hardship. Actually, they are less likely to expect a greater degree of satisfaction when they are completely resettled. On Item 52, sixty percent of victims with minor hardship expect "average" satisfaction and seventeen percent expect "more" satisfaction when resettled. Of the major hardship victims, forty-two percent expect "average" satisfaction and thirty-two percent expect "more" satisfaction when resettled.

Although perceived progress toward resettlement, Item 51, lends support to the alternate hypothesis, an overall comparison of hardship in relationship to dimensional adjustment reveals that the null hypothesis (H_{02}) cannot be rejected. But the data resulting from the testing of this

TABLE II
 HARDSHIP CROSSTABULATED BY THE DIMENSIONAL
 ADJUSTMENT VARIABLES

Survey Item Number	Adjustment Variable Question / Response	Hardship	
		Major No. (%)	Minor No. (%)
50	Satisfaction with progress toward resettlement		
	Dissatisfied	11 16%	7 16%
	Satisfied	60 85%	38 84%
	Subtotal n=116	71 101% ^a	45 100%
	Chi-square=.06		
	Significance Level=.92		
	Resettled	24 25% ^b	40 47% ^b
	Total N=180	95	85
51	Resettlement progress in comparison to other victims		
	Worse	14 15%	5 5%
	Average	46 49%	26 28%
	Better	34 36%	61 66%
	Total N=186	94 100%	92 99% ^a
	Chi-square=17.47		
	Significance Level=.001		
	Tau=.31		
	Significance Level=.00		
52	Expected satisfaction when resettled		
	Less	18 26%	12 23%
	Average	29 42%	31 60%
	More	22 32%	9 17%
	Subtotal n=121	69 100%	52 100%
	Chi-square=4.42		
	Significance Level=.11		
	Resettled	29 30% ^b	41 44% ^b
	Total N=191	98	93

TABLE II—Continued

Survey Item Number	Adjustment Variable Question / Response	Hardship			
		Major		Minor	
		No.	(%)	No.	(%)
135	Life satisfaction				
	Not satisfied	8	8%	3	3%
	Satisfied	90	92%	92	97%
	Total N=193	98	100%	95	100%
	Chi-square=1.14				
	Significance				
	Level=.23				

^aSubtotal or total percentages may be greater or less than 100% due to rounding error.

^bThe resettlement percentage is calculated in terms of the percent of the total number of persons who responded to this survey item.

hypothesis must be interpreted rather tentatively because no comparison has been made between the levels of satisfaction of those who are completely resettled and those who are still in the process of resettlement, Items 50 and 52. And measurement of perceived progress toward resettlement, Item 51, does not differentiate between persons who are already resettled and those who are not. It is possible that the test of adjustment related to this survey item is biased in the sense that many victims who experienced minor hardship were already resettled. Thus, perceived progress toward resettlement might not have been significantly related to hardship if those who had already resettled had not been included among the respondents to this survey item.

Hypothesis Three

H_{O3} No difference in adjustment after a natural disaster will exist between victims of combined age and hardship cohorts.

H_{A3} Victims age sixty and over with minor hardship will adjust more positively to disaster than victims of other combined age and hardship categories.

Alternate hypothesis three states that age in combination with the extent of hardship will affect dimensional adjustment. It is specifically hypothesized that after a disaster:

1. Victims sixty and over with minor hardship will exhibit the highest level of positive adjustment.

2. Victims under sixty with minor hardship will

exhibit a high level of positive adjustment.

3. Victims sixty and over with major hardship will exhibit a moderate level of positive adjustment.

4. Victims under sixty with major hardship will exhibit a low level of positive adjustment.

The alternate hypothesis is not supported and thus the null hypothesis is not rejected. The relationship of age and hardship against dimensional adjustment is not significant in three cases. And although one statistically significant relationship emerges, it does not support the postulated direction of the alternate hypothesis. In Item 51, it can be seen that over sixty percent of victims, both young and old, who experienced major hardship state that they perceive "average" or "below average" progress towards resettlement. At the same time, more than sixty percent of respondents with minor damage, regardless of age, state that they perceive "better than average" progress ($\chi^2=18.7$, $p < .05$; $r = -.12$, $p < .05$).

The results suggest that those hit hardest by the tornado differ, in their perceived progress toward resettlement, from those who experienced minor hardship. Also age does not appear to be a factor which affects this relationship. This finding may relate to the concept of relative deprivation. Victims suffering major hardship may be comparing themselves to others who may have been able to

TABLE III

AGE AND HARDSHIP CROSSTABULATED BY THE DIMENSIONAL ADJUSTMENT VARIABLES

Survey Item Number	Adjustment Variable Question / Response	Age and Hardship					
		Under 60	Under 60	60 and Over	60 and Over	60 and Over	60 and Over
		Minor Hardship No. (%)	Major Hardship No. (%)	Minor Hardship No. (%)	Major Hardship No. (%)	Minor Hardship No. (%)	Major Hardship No. (%)
50	Satisfaction with progress toward resettlement						
	Dissatisfied	4a 15%	8 17%	3a 17%	3a 17%	3a 13%	
	Satisfied	23 85%	40 83%	15 83%	20 87%	20 87%	
	Subtotal n=116 Chi-square=.18 Significance Level=.98	27 100%	48 100%	18 100%	23 100%	23 100%	
50	Resettled	23 46%b	13 21%b	17 49%b	11 32%b		
	Total N=180	50	61	35	34		
51	Resettlement progress in comparison to other victims						
	Worse	4 7%	8 14%	1a 3%	6 17%		
	Average	14 26%	30 51%	12 32%	16 46%		
	Better	37 67%	21 36%	24 65%	13 37%		
	Total N=186	55 100%	59 101%c	37 100%	35 100%		
	Chi-square=18.66 Significance Level=.004 Tau=-.12 Significance Level=.03						

TABLE III--Continued

Survey Item Number	Adjustment Variable Question / Response	Age and Hardship							
		Under 60		60 and Over		60 and Over			
		Minor Hardship No. (%)	Major Hardship No. (%)	Minor Hardship No. (%)	Major Hardship No. (%)	Minor Hardship No. (%)	Major Hardship No. (%)		
52	Expected satisfaction when resettled	8	25%	12	26%	4 ^a	20%	6 ^a	27%
	Less	18	56%	18	38%	13	65%	11	50%
	Average	6	19%	17	36%	3	15%	5	23%
	Better	32	100%	47	100%	20	100%	22	100%
	Subtotal n=121								
	Chi-square=6.29								
	Significance Level=.39								
	Resettled	24	43% ^b	15	24% ^b	17	46% ^b	14	39% ^b
	Total	56		62		37		36	
135	Life satisfaction								
	Not satisfied	2 ^a	4%	5 ^a	8%	1 ^a	3%	3 ^a	8%
	Satisfied	54	96%	57	92%	38	97%	33	92%
	Total	56	100%	62	100%	39	100%	36	100%
	Chi-square=2.3								
	Significance Level=.51								

^aThe expected frequency for this cell is less than five.

^bThe resettlement percentage is calculated in terms of the percent of the total number of persons who responded to this survey item.

^cSubtotal or total percentages may be greater or less than 100% due to rounding error.

make repairs and thus were resettled at the time of the survey. Evidence for this interpretation can be seen in Item 50; over forty percent of victims with minor hardship are resettled whereas fewer respondents with major hardship are resettled.

Several interesting statistics seen in Table III, while not statistically significant, suggest relationships may exist contrary to those hypothesized. Old victims with major hardship have a lower level of positive adjustment than younger victims with major hardship when adjustment is measured as "expected satisfaction when resettled." Item 52. Thirty-six percent of young victims expect to be "more satisfied" when only twenty-three percent of old respondents expect this. Perhaps this tendency can be explained by examining older persons who are resettled in that a greater number of elderly with major hardship were already resettled at the time of the survey. Thus the large response of older persons in the "average" or "below average" satisfaction categories may be due to their comparing themselves with their resettled age-peers.

Hypothesis Four

- H_{O4} No difference in adjustment after natural disaster will exist between victims living with a family member and victims living alone.
- H_{A4} Victims living with a family member will adjust more positively to a disaster than victims living alone.

In H_{A_4} a direct relationship is hypothesized to exist between family status and dimensional adjustment. This hypothesis is not supported by the test results, Table IV, along any measure of adjustment used. Some statistical tendencies, however, are present that show a reverse direction to that hypothesized in H_{A_4} . Single victims more frequently express that they perceive "better" resettlement progress in comparison to other victims (Item 51), sixty-five percent as compared to fifty percent of family member victims, although it is interesting to note that family member victims more frequently were satisfied with their lives, ninety-five percent, compared to eight-seven percent for single victims. Since these tendencies are not statistically significant, the null hypothesis is not rejected.

It is possible that the results were not significant for the following reasons. First, resettled persons are not excluded from stating their perceived progress toward resettlement, and the response to Item 51 is thus likely to be biased in the direction of showing greater progress for single victims. Fifty-seven percent of single victims were resettled, Item 52, at the time of the survey, and it is possible that many of these persons' responses were included in the "better than others" category of perceived progress toward resettlement. Secondly, the total number of single victims is quite small, twenty-three, and therefore the cell

TABLE IV
FAMILY STATUS CROSSTABULATED BY THE DIMENSIONAL
ADJUSTMENT VARIABLES

Survey Item Number	Adjustment Variable Question / Response	Family Status			
		Family Member		Single	
		No.	(%)	No.	(%)
50	Satisfaction with progress toward resettlement				
	Dissatisfied	15	15%	2 ^a	15%
	Satisfied	83	85%	11	85%
	Subtotal n=111	98	100%	13	100%
	Chi-square=.16				
	Significance Level=.69				
	Resettled	53	35% ^b	8	38% ^b
	Total N=177	151		21	
51	Resettlement progress in comparison to other victims				
	Worse	15	10%	4 ^a	17%
	Average	63	41%	4	17%
	Better	76	50%	15	65%
	Total N=177	154	101% ^c	23	99% ^c
	Chi-square=5.00				
	Significance Level=.08				
52	Expected satisfaction when resettled				
	Less	26	24%	2 ^a	20%
	Average	53	50%	6	60%
	More	28	26%	2 ^a	20%
	Subtotal n=117	107	100%	10	100%
	Chi-square=.41				
	Significance Level=.82				
	Resettled	53	33% ^b	13	57% ^b
	Total N=183	160		23	

TABLE IV—Continued

Survey Item Number	Adjustment Variable Question / Response	Family Status	
		Family Member No. (%)	Single No. (%)
135	Life satisfaction		
	Not satisfied	8 5%	3 ^a 13%
	Satisfied	155 95%	20 87%
	Total N=186	163 100%	23 100%
	Chi-square=1.16		
	Significance Level=.28		

^aThe expected frequency for this cell is less than five.

^bThe resettlement percentage is calculated in terms of the percent of the total number of persons who responded to this survey item.

^cSubtotal or total percentages may be greater or less than 100% due to rounding error.

frequencies for Chi-square in three out of four cases are below the required expected frequencies for this test.

Hypothesis Five

H_{O_5} No difference in adjustment after a natural disaster will exist between victims whose family relationships have improved and victims whose family relationships have deteriorated or shown no change.

H_{A_5} Those victims whose family relationships have improved since a disaster will adjust more positively to disaster than victims whose family relationships have deteriorated or shown no change.

A relationship is postulated by H_{A_5} to exist between affective family relationship and dimensional adjustment. This proposed relationship, however, is not supported by the test results, and thus the null hypothesis is not rejected (see Table V). Although as in Table IV, the expected frequencies are too low within three Chi-square tests, and thus these tests cannot be considered statistically valid.

Regardless of statistical significance, three interesting tendencies can be observed in this table. First, the percentage response suggests a relationship similar to that hypothesized in H_{A_5} . Victims whose family ties have "deteriorated" are less positively adjusted than respondents whose feelings show "improvement" or "no change" (Items 51, 52, and 135). For example, there are no persons whose families have become less close or happy that expect "more than average" satisfaction when resettled (Item 52), whereas forty-four to twenty-four percent of persons with closer

family relationships or no change expect greater satisfaction. Furthermore, victims whose family affective relationships have changed for the worse are not as satisfied with their lives, seventy-eight percent, as those victims whose relationships have not changed or have changed for the better; where over ninety percent of these two cohorts are satisfied with their lives (Item 135). Secondly, it is interesting to note that very few of those with worsened family relationships were resettled at the time of the survey, twenty-two percent. Even though the number of persons in this category is small one might speculate whether the deterioration of the relationships prevented quick resettlement or whether the lack of resettlement precipitates a decline in family happiness. Thirdly and most importantly, the overwhelming majority of respondents, eighty-three percent, declare no change in family relationships. And another thirteen percent of the respondents state that "improved" relationships have occurred. These figures were obtained by dividing the affective family relationship categories from Item 135 by two-hundred. Surprisingly, the disaster and its aftermath appears not to have changed the victims' affective relationship, and where changes have resulted, it appears to have brought the victims' families closer together.

TABLE V

FAMILY AFFECTIVE RELATIONSHIP CROSSTABULATED BY THE DIMENSIONAL ADJUSTMENT VARIABLES

Survey Item Number	Adjustment Variable Question / Response	Relationship Change				
		More Satisfaction		Less Satisfaction		No Change
		No. (%)	No. (%)	No. (%)	No. (%)	
50	Satisfaction with progress toward resettlement					
	Dissatisfied	2 ^a 12%	1 ^a 14%	15 16%		
	Satisfied	15 88%	6 86%	78 84%		
	Subtotal n=117	17 100%	7 100%	93 100%		
	Chi-square=.22 Significance Level=.90					
51	Resettled	9 35% ^b	2 22% ^b	55 37% ^b		
	Total	26	9	148		
	Resettlement progress in comparison to other victims					
51	Worse	2 ^a 8%	0 ^a 0%	17 11%		
	Average	6 25%	5 56%	62 40%		
	Better	16 67%	4 44%	78 50%		
	Total	24 100%	9 100%	157 101%		
	Chi-square=4.19 Significance Level=.38					

TABLE V—Continued

Survey Item Number	Adjustment Variable Question / Response	Relationship Change			
		More Satisfaction No. (%)	Less Satisfaction No. (%)	No Change No. (%)	
52	Expected satisfaction when resettled				
	Less	3 17%	3 ^a 43%	24 25%	
	Average	7 39%	4 57%	50 52%	
	Better	8 44%	0 0%	23 24%	
	Subtotal n=122	18 100%	7 100%	97 101% ^c	
	Chi-square=6.43				
	Significance Level=.17				
	Resettled				
	Total N=196	8 31% ^b	2 22% ^b	64 40% ^b	
		26	9	161	
135	Life satisfaction				
	Not satisfied	2 ^a 8%	2 ^a 22%	7 4%	
	Satisfied	24 92%	7 78%	158 96%	
	Total N=200	26 100%	9 100%	165 100%	
	Chi-square=5.58				
	Significance Level=.06				

^aThe expected frequency for this cell is less than five.

^bThe resettlement percentage is calculated in terms of the percent of the total number of persons who responded to this survey item.

^cSubtotal or total percentages may be greater or less than 100% due to rounding error.

Hypothesis Six

H_{O6} No difference in adjustment after a natural disaster will exist between victims who receive the majority of their disaster relief from their families and victims who received the majority of their disaster relief from other sources.

H_{A6} Victims who received a majority of their disaster relief from their families will adjust more positively to disaster than victims who receive the majority of their disaster relief from other sources.

A relationship is postulated to exist between the major source of disaster-relief assistance and dimensional adjustment in H_{A6} . It is speculated that victims who receive major assistance from their families will adjust more positively than victims who receive the same assistance from agencies, neighbors or friends.

This hypothesis is not supported at a statistically significant level in any case (see Table VI), and thus the null hypothesis is not rejected. More than two-thirds of the respondents received most of their disaster assistance from friends and neighbors. Thus the expected cell frequencies in the family and agency categories were often too small to result in statistically valid Chi-square tests. Furthermore, fewer than half of the sample, eighty-three respondents, answered the questions relating to this hypothesis. This may be due to the complicated instructions given to the interviewers regarding these survey items. They may not have asked the questions if they did not completely understand how to administer them.

TABLE VI
MAJOR SOURCE OF SUPPORT CROSSSTABLATED BY THE DIMENSIONAL ADJUSTMENT VARIABLES

Survey Item Number	Adjustment Variable Question / Response	Major Source of Support			
		Family No. (%)	Agency No. (%)	Friends/ Neighbors No. (%)	
50	Satisfaction with progress toward resettlement				
	Dissatisfied	1 ^a 11%	2 ^a 20%	7 19%	
	Satisfied	8 89%	8 80%	30 81%	
	Subtotal n=56 Chi-square=.34 Significance Level=.84	9 100%	10 100%	37 100%	
Resettled Total N=80		4 31% ^b	2 17% ^b	18 33% ^b	
		13	12	55	
51	Resettlement to other victims				
	Worse	3 ^a 23%	1 ^a 9%	6 11%	
	Average	5 39%	4 36%	27 49%	
	Better	5 39%	6 ^a 55%	22 40%	
Total N=79 Chi-square=2.36 Significance Level=.67	13 101% ^c	11 101% ^c	55 100%		

TABLE VI—Continued

Survey Item Number	Adjustment Variable Question / Response	Major Source of Support			
		Family No. (%)	Agency No. (%)	Friends/ Neighbors No. (%)	
52	Expected satisfaction when resettled				
	Less	3 ^a 30%	2 ^a 25%	8 22%	
	Average	1 ^a 10%	5 ^a 63%	20 56%	
	More	6 ^a 60%	1 ^a 13%	8 22%	
	Subtotal= n=54 Chi-square=8.79 Significance Level=.07	10 100%	8 101% ^c	36 100%	
135	Resettled	3 23% ^b	4 33% ^b	22 38% ^b	
	Total	13	12	58	
	Life satisfaction				
Not satisfied	1 ^a 8%	1 ^a 8%	4 ^a 7%		
Satisfied	12 92%	11 92%	58 93%		
Total	13 100%	12 100%	58 100%		
	Chi-square=.04 Significance Level=.98				

^aThe expected frequency for this cell is less than five.

^bThe resettlement percentage is calculated in terms of the percent of the total number of persons who responded to this survey item.

^cSubtotal and total percentages may be greater or less than 100% due to rounding error.

Hypothesis Seven

- H_{O_7} No difference in adjustment after a natural disaster will exist between victims who receive the majority of their mental support from their families and victims who receive the majority of their mental support from other sources.
- H_{A_7} Victims who receive most of their mental support after a disaster from their immediate families will adjust more positively to disaster than victims who received most of their mental support from other sources.

Differing sources of mental support are postulated to be related to dimensional adjustment according to H_{A_7} . But a review of the data in Table VII reveals no statistically significant differences. Therefore H_{A_7} is not supported and the null hypothesis, H_{O_7} , is not rejected. However, directional tendencies in accord with those hypothesized in the alternate hypothesis do appear in the percentage statistics. In satisfaction with progress toward resettlement, Item 50, a strong tendency can be noted in support of this hypothesis. Victims who received mental support from their immediate family are more frequently satisfied, ninety-four percent than are those who received mental support from extended family or others, seventy-nine and seventy-seven percents respectively. Victims who received mental support from both their immediate and extended families are more likely to perceive that they are resettled "better" in comparison to other victims (Item 51).

The most interesting finding that emerges from Table

TABLE VII
SOURCE OF MENTAL SUPPORT CROSSTABULATED BY THE DIMENSIONAL ADJUSTMENT VARIABLES

Survey Item Number	Adjustment Variable Question / Response	Mental Support Source				
		Immediate Family No. (%)	Extended Family No. (%)	Others No. (%)		
50	Satisfaction with progress toward resettlement	3	6 ^a	21%	8	24%
	Dissatisfied	46	22	79%	26	77% ^b
	Satisfied	49	28	100%	34	101% ^b
	Subtotal n=111 Chi-square=5.77 Significance Level=.06	33	14	40% ^c	15	31% ^c
51	Resettled	33	14	33% ^c	15	31% ^c
	Total N=173	82	42		49	
	Resettlement progress in comparison to other victims	9	2 ^a	5%	6 ^a	12%
	Worse	29	19	44%	24	49%
51	Average	47	22	51%	19	39%
	Better	85	43	100%	49	100%
	Total N=177 Chi-square=5.13 Significance Level=.27	9	2 ^a	5%	6 ^a	12%
	Worse	29	19	44%	24	49%

TABLE VII--Continued

Survey Item Number	Adjustment Variable Question / Response	Mental Support Source		
		Immediate Family No. (%)	Extended Family No. (%)	Others No. (%)
52	Expected satisfaction when resettled			
	Less	12 23%	4 15%	12 34%
	Average	30 57%	16 59%	11 31%
	More	11 21%	7 26%	12 34%
		53 101% ^b	27 100%	35 99% ^b
	Subtotal n=115			
	Chi-square=7.34			
	Significance Level=.12			
	Resettled	34 39% ^c	16 37% ^c	17 33% ^c
	Total N=182	87	43	52
135	Life satisfaction			
	Dissatisfied	7 8%	0 ^a 0%	4 ^a 8%
	Satisfied	82 92%	43 100%	49 93% ^b
	Total N=185	89 100%	43 100%	53 101% ^b
	Chi-square=3.55			
	Significance Level=.17			

^aThe expected frequency for this cell is less than five.

^bSubtotal or total percentages may be greater or less than 100% due to rounding error.

^cThe resettlement percentage is calculated in terms of the percent of the total number of persons who responded to this

VII is that seventy-one percent of the victims received the majority of their mental support, support in attaining a sense of direction, from their immediate and extended families. This is a remarkable contrast to the results cited in Table VI, where it was found that most victims receive their disaster assistance from friends and neighbors. It appears that the sources of mental and physical support are not the same. Yet, the finding that family members provide mental support assistance adds important data to current knowledge about the nature of families' functioning following the impact of natural disasters.

SUMMARY AND CONCLUSIONS

The testing of the hypotheses did not substantiate the inter-relationships postulated to exist in the model of adjustment. No uniform evidence was produced to reject the null hypotheses or support the alternate hypotheses.

One finding did emerge through the testing of the first hypothesis. Since the null hypothesis was not rejected, it was found that victims sixty years of age and over had adjusted as well after the disaster as those under age sixty. This is a finding of interest because the review of the literature described many handicaps which have been hypothesized to inhibit the recovery process of elderly victims. It was also pointed out in this literature review that older persons might be expected to adjust better than younger persons to crisis situations.

Although both negative and positive adjustment has been postulated to be characteristic of the elderly victim population, no difference was found to exist between age cohorts. But the proposition that the elderly adjust better may be considered feasible in relation to findings that the older people received a smaller proportion of available disaster assistance offered from formal disaster-relief organizations after the Omaha tornado (Kara, 1976A). Thus

considering only this one fact, the elderly may be considered as having adjusted better. Additional support for this proposition is found in the "resettlement" category of Items 50 and 52 in Tables I and III, where it can be seen that the sixty-and-over cohort had "resettled" more frequently than the under-age-sixty cohort.

Two explanations are offered as an interpretation of the results from the testing of the first hypothesis. First, older people might be expected to adjust to disaster as well as or better than younger adults because they have faced many more crises in their lives such as wars, the Great Depression, and the deaths of family and friends. Secondly, they are less frequently dependent upon agency services and thus these services may not be essential to their recovery.

Future research might develop additional indicators of adjustment (e.g. psychological, social, etc.) by which to test the age-related thesis findings. Qualitative research might investigate whether handicaps affect adjustment and what coping mechanisms are used by the elderly in their adjustment process. It is also suggested that formal disaster-relief agencies should be alerted to special techniques that might make their assistance more appealing to old people, thus increasing the elderly's share of available assistance after future disasters (see Kara, 1976B for

a discussion of these techniques).

Degree of hardship was not generally found to influence dimensional adjustment as seen in the testing of the second hypothesis. Although one statistically significant relationship was found, victims who experienced minor hardship perceived that they had progressed better in their resettlement than other victims, it seems apparent why this relationship was significant. That is that a greater percentage of the minor-hardship cohort considered themselves resettled at the time of the interview.

Perhaps hardship in future studies might be operationalized to include such factors as the death of a family member, serious injury, loss of job, etc., in addition to damage to the victim's home. The latter variable was used in the thesis because five percent or less of the victims of the Omaha tornado suffered from any of these additional indicators of hardship (see Appendix I for a further discussion of hardship).

Considering the results of the testing of the first two hypotheses, it is not surprising that the third hypothesis, which combined the age and hardship cohorts, resulted in only one statistically significant relationship. This finding was that respondents who experienced minor hardship perceived that they were progressing better in their resettlement progress when they compared themselves to other

victims (this is the same finding as was found to be statistically significant from the testing of the second hypothesis). Thus it was found that degree of hardship, but not age, influenced adjustment in this one case.

The testing of the fourth hypothesis revealed that single and family member victims did not differ in adjustment patterns. An assumption had been made that when victims lived in a family unit that they would benefit from the interpersonal support function of the nuclear family, and, thus, that "single" victims would not be as likely to benefit from this type of support. Although no differences were found, this assumption could not be adequately tested because only twenty-three person lived by themselves and were thus considered as "single" victims. Perhaps future research can explore the hypothesized prediction (H_{A4}) that family members will adjust better and at the same time investigate the relationship of the "single" victims to their families.

The null form of the fifth hypothesis was not rejected and, thus, the alternate hypothesis was not substantiated. But the alternate form of the fifth hypothesis was supported by statistical tendencies. Victims whose family relationships had "improved" tended to experience more positive adjustment than victims whose family relationships had "deteriorated" or "not changed."

The most striking descriptive statistic revealed from the testing of this hypothesis was that the majority of victims felt that their family affective relationship had "not changed." Eighty-three percent of the victims selected this response. But when change occurred it was more likely to have "improved," thirteen percent, than to have "deteriorated," seven percent.

That relationships had not changed suggests that (1) relationships may have changed but had stabilized before the respondents were interviewed or that (2) an assumption made in the statement of the thesis research is not valid. This assumption was that a crisis model of adjustment used to study families reunited after a war would apply to families who were victims of a natural disaster. Both crises are disruptions of a family's life, but they may differ substantially, thus limiting the generalizations that can be used to tie these events together. For example, the relationships within a family change when a man leaves to fight a war, necessitating adjustment in family relations when he returns. After a disaster, unless a family member dies, family relationships may not change. Roles and responsibilities may remain the same but apply to a new set of life-circumstances.

Future research in this area might attempt to determine whether the family suffers disorganization and then gradually adopts patterns of behavior that help one another

adjust, or whether the family, as in the case of their behavior immediately after the impact of a disaster, is rational and organized from the beginning and this determination never deteriorates as they strive to reorder their lives.

The sixth hypothesis found that disaster-relief assistance, regardless of the source, is just as likely to be associated with positive adjustment. Although the descriptive data from this hypothesis supports the findings of Drabek and Key (1975) that relatives and friends most frequently provide the greatest amount of disaster assistance when compared to formal disaster-relief agencies, more specifically, it was found that friends and neighbors provide more of this type of assistance than the combined categories of family and agency.

The final hypothesis revealed no statistically significant differences in positive adjustment when mental health categories are compared. Yet the testing of this hypothesis pointed out an interesting fact—the immediate family was most frequently the major source of mental support. Forty-eight of the respondents were aided "in attaining a sense of direction" from their immediate families. This finding may be taken as additional evidence that family members are supportive of one another and provide "therapy" that leads ultimately to integration, solidarity and maintenance of the family.

To sum-up, the postulated model of adjustment was not substantiated. No statistically significant differences were found to exist between age cohort adjustment patterns. With regard to hardship, although one statistically significant difference was found in perceived progress toward resettlement, no statistical differences were found when hardship was taken against the other three dimensional adjustment variables. No differences, statistically, were exhibited between the family variable categories and adjustment. Therefore, in all cases the null hypotheses were not rejected.

Although not significant, some interesting descriptive statistics resulted from the testing of the thesis hypotheses. It was found that: (1) older persons adjusted to disaster as well as younger adults, (2) the majority of the respondents felt that their family relationships had not changed, (3) friends and neighbors provided more than two-thirds of disaster-assistance in the form of cash, clothing, furniture, food, and temporary housing compared to the assistance accepted from relatives and agencies, and (4) the immediate family is most frequently turned to as the source of mental assistance compared to any other possible source.

Because the thesis model was not supported, the attempt in the thesis at theory building was not successful. The model of adjustment to war separation (Hill, 1949) was

not generalizable to adjustment to disaster. And the descriptive statistics resulting from the testing of the thesis model of adjustment do not interrelate, thus any secondary, or after the fact, theory building is impossible. But the findings revealed by the descriptive statistics do constitute a valuable contribution to social gerontology and to the studies of the internal functioning of the family and the roles of friends and neighbors in time of disaster.

APPENDIX I
SELECTED CHARACTERISTICS OF THE VICTIM SAMPLE

SELECTED CHARACTERISTICS OF THE VICTIM SAMPLE

Table VIII contains responses to questions asked only of the victim sample, each represents a hardship that the victims may have suffered. Hypothetically, they may influence ability to adjust to the stress caused by a natural disaster.

In Item 21 it is revealed that 73% of the victim sample had family members in the area that was struck by the tornado. The literature review has pointed out that the safety of one's family is a primary concern after natural disasters. Nearly three-fourths of this sample may have experienced this concern.

Five percent of the sample had household members who suffered a tornado-related injury, as seen in Item 30. This finding is interesting when compared to the finding that this same percent, five, was found when the respondents were asked if they required medical care following the tornado, Item 32. Of this five percent, three percent (Item 33), state that they required medical care for a minor injury. No one responded that they had suffered a major injury. And one percent of the respondents still required medical care at the time of the survey, Item 35.

Items 37, 38, and 39 surveyed damage respectively to

the respondent's home, personal possessions and car(s). Forty-eight percent of the victims expressed that their homes received minor damage while another fifty percent state that major damage had occurred. Eighty percent of the victims lost personal possessions such as furniture and clothing. Fifty-two percent of the sample experienced minor loss of these items and twenty-eight percent lost most or all of these possessions. With regard to damage of cars, twenty percent of the respondents report minor damage while forty-one percent report major damage or total destruction.

Job loss is the final element of tornado-related hardship which was surveyed. Only three percent of the sample lost their job because of the destruction of their place of employment, Item 40.

Hardship in this thesis was represented by damage to the victim's home because five percent or less of the victims: (1) suffered an injury, (2) had a family member who suffered a tornado-related injury, or (3) lost a job because their place of employment was destroyed. Also, twenty percent of the victims did not lose personal possessions and another thirty-four percent reported no damage to their car(s). It was thus felt that damage to the victim's home most uniformly represented hardship experienced.

TABLE VIII
SELECTED CHARACTERISTICS OF THE VICTIM SAMPLE

Survey Item Number	Question / Response	Percent of Victim Sample
29	Were any members of your family (household) in the damaged area when the tornado struck?	
	Yes	73%
	No	26%
30	Did you or any member of your family suffer a personal injury?	
	Yes	5%
	No	94%
32	In the period after the tornado did you require any medical care?	
	Yes	5%
	No	94%
33	Please describe the kind of medical problem you had.	
	Major injury	0%
	Minor injury	3%
	Other	3%
	Not applicable	94%
35	Do you still require medical care?	
	Yes	1%
	Not applicable	99%
37	How badly was your home damaged (refers to structural damage)?	
	Minor damage	48%
	Major or total	50%
	No damage	2%

TABLE VIII—Continued

Survey Item Number	Question / Response	Percent of Victim Sample
38	How extensive was the loss or damage to personal possessions?	
	Minor losses	52%
	Major losses	28%
	No loss	20%
39	Was/were your car/cars damaged?	
	Minor damage	20%
	Major damage	41%
	No damage	34%
40	Did you lose your job because the tornado destroyed your business location?	
	Yes	3%
	No	63%
	Not applicable	29%

APPENDIX II
THESIS VARIABLE SURVEY ITEMS

Thesis Variable Survey Items

The questions beginning below comprise the thesis variables. They have been replicated exactly as they appear in the "Disaster Impact and Response Survey." The entire survey has not been included because it contains twenty - pages and 213 questions. But a copy can be obtained from the Gerontology Program, Annex 24, University of Nebraska at Omaha, Box 688, Omaha, Nebraska 68101.

Survey Items

Survey Item Number	Question / Response
3 ^{AB}	Besides yourself how many adults 18 years old and over are presently living in your home? (Code actual number)
4 ^{AB}	How many children under 6 years old presently live with you? (Code actual number)
5 ^{AB}	How many children 6 through 12? (Code actual number)
6 ^{AB}	How many teenagers 13 through 17? (Code actual number)
11 ^B	What was your age at your <u>last</u> birthday? (Code actual number)
37	How badly was your home damaged? (Refers to structural damage to building) 1 = no damage 2 = minor damage 3 = somewhat damaged but could remain while repaired

Survey Items - Continued

Survey Item Number	Question / Response
37-cont.	4 = badly damaged--required moving out until repaired 5 = totally destroyed
50	How satisfied are you with your present progress toward re-settlement? 1 = very dissatisfied 2 = somewhat dissatisfied 3 = somewhat satisfied 4 = very satisfied 5 = completely resettled 6 = other
51	How well are you progressing in getting resettled <u>compared to other people you know that were affected by the tornado?</u> 1 = much worse than most 2 = somewhat worse than most 3 = about average 4 = somewhat better than most 5 = much better than most
52	When you are completely re-settled, do you expect that you will be as satisfied as you were before the tornado? 1 = expect to be much less satisfied 2 = expect to be somewhat less satisfied 3 = expect to be about the same 4 = expect to be somewhat more satisfied 5 = expect to be much more satisfied 6 = already resettled
54 ^B	Have your relationships with your family changed as a result of the tornado? If yes, in what way have these relationships changed? 1 = much less satisfactory, happy, close, etc. 2 = somewhat less satisfactory, happy, close, etc. 3 = somewhat better, closer, happier, etc. 4 = much better, closer, happier, etc. 5 = not applicable--there have been no change in family relationships.

Survey Items - Continued

Survey Item Number	Question / Response
135 ^B	<p>On the whole, how satisfied would you say you are with your way of life today?</p> <p>1 = not satisfied at all 2 = not very satisfied 3 = somewhat satisfied 4 = quite satisfied 5 = very satisfied</p>
140 ^{AB}	<p>What is your present marital status?</p> <p>1 = never married 2 = married 3 = separated 4 = divorced 5 = widowed</p>
199	<p>What percentage of loans, cash and grant assistance did you receive from the following sources after the tornado?</p> <p>1 = percentage of assistance from immediate family and relatives 2 = percentage of assistance from community disaster agencies 3 = percentage of assistance from friends and neighbors</p>
200	<p>What percentage of furniture did you receive?</p> <p>1 = percentage of assistance from immediate family and relatives 2 = percentage of assistance from community disaster agencies 3 = percentage of assistance from friends and neighbors</p>
201	<p>What percentage of clothing did you receive?</p> <p>1 = percentage of assistance from immediate family and relatives 2 = percentage of assistance from community disaster agencies 3 = percentage of assistance from friends and neighbors</p>

Survey Items - Continued

Survey Item Number	Question / Response
202	What percentage of food did you receive? 1 = percentage of assistance from immediate family and relatives 2 = percentage of assistance from community disaster agencies 3 = percentage of assistance from friends and neighbors
203	What percentage of temporary housing did you receive? 1 = percentage of assistance from immediate family and relatives 2 = percentage of assistance from community disaster agencies 3 = percentage of assistance from friends and neighbors
204	Who did you receive the most support from after the tornado? Support in the sense of helping you attain a sense of direction? 1 = family outside immediate household 2 = family living in your household 3 = friend 4 = neighbor 5 = priest 6 = doctor 7 = other, specify _____ 8 = not applicable--not affected by the tornado

A These Items are combined for the family status variable.
 B These Items were asked in the control respondent questionnaire.

SELECTED BIBLIOGRAPHY

- Adams, Nina, et al.,
1974 Encyclopedia of Sociology. Guildford: Danskin Publishing Group, Inc.
- Baker, George W., and Dwight W. Chapman
1962 Man and Society in Disaster. New York: Basic Books Inc.
- Barton, Allen H.
1969 Communities in Disaster: A Sociological Analysis of Collective Stress Situations. New York: Doubleday and Co. Inc.
- Bates, F. L.
1963 The Social and Psychological Consequences of a Natural Disaster: A Longitudinal Study of Hurricane Audrey. National Academy of Sciences, National Research Council Disaster Study #18. Washington: National Academy of Sciences Printing Office.
- Bell, Bill D.
1975 "Natural Disasters and the Elderly: A Preliminary Report of Research Efforts, Need Review, and Implementation Suggestions." Technical Report. Gerontology Program, University of Nebraska at Omaha.
- Bell, Bill D., Joseph Harry, Gail Kara, and Constance Batterson
1976 Service Priorities for the Elderly in Natural Disasters: A Research Report. Gerontology Program, University of Nebraska at Omaha.
- Bell, Norman W., and Ezra F. Vogel
1960 "Toward a Framework for Functional Analysis of of Family Behavior." Pp. 1-37 in Norman Bell and Ezra Vogel (eds.), A Modern Introduction to the Family. Glencoe, Ill.: The Free Press.
- Burgess, Ernest W.
1947 "The Family and Sociological Research." Social Forces Vol. 26, No. 1:1-6.

- Burgess, Ernest W., and Harvey J. Locke
1960 The Family. New York: American Book Co.
- Cohen, Elias
1976 The Impact of a Major Natural Disaster on the Elderly and Societal Response to Their Needs, Vol. I. Department of Community Medicine, University of Pennsylvania, Philadelphia.
- Drabek, Thomas, and William H. Key
1972 "Meeting the Challenge of Disaster: Family Responses and Long-Term Consequences." A paper presented at the Japanese-United States Research Conference on Organizational and Community Responses to Disaster in Columbus, Ohio. Department of Sociology, University of Denver.
1975 "The Long-Term Consequences of Disasters on a Family." Report from the Second Annual Invitational Conference on Natural Hazards in Boulder, Colorado. Department of Sociology, University of Denver.
- Drabek, Thomas, William Key, Patricia Erickson, and Juanita L. Crowe
1973 Final Progress Report. Report to the National Institute of Mental Health. Department of Sociology, University of Denver.
- Festinger, L.
1957 A Theory of Cognitive Dissonance. Evanston: Row, Peterson.
- Form, William H., and Sigmund Nosow
1958 Communities in Disaster. New York: Harper and Brothers.
- Friedsam, H.J.
1961 "Reactions of Older Persons to Disaster-Caused Losses: A Hypothesis of Relative Deprivation." Gerontologist Vol. 1, No. 1:34-37.
1962 "Older Persons in Disaster." Pp. 151-182 in G. W. Baker and D. W. Chapman (eds.), Man and Society in Disaster. New York: Basic Books, Inc.
- Grossner, George H., et al.
1964 The Threat of Impending Disaster: Contributions to the Psychology of Stress. Cambridge: MIT Press.

Haas, J. Eugene and Thomas Drabek

- 1970 "Community Disaster and Systems Stress: A Sociological Perspective." Pp. 246-286 in Joseph McGrath (ed.), *Social and Psychological Factors in Stress*. New York: Holt, Rinehart and Winston.

Hansen, Donald A., and Reuben Hill

- 1964 "Families Under Stress." Pp. 782-819 in Harold T. Christenson (ed.), *Handbook of Marriage and the Family*. Chicago: Rand McNally & Company.

Heider, F.

- 1958 *The Psychology of Interpersonal Relationships*. New York: Wiley.

Hill, Reuben

- 1949 *Families Under Stress: Adjustment to the Crises of War Separation and Reunion*. New York: Harper and Brothers.

Hill, Reuben, and Donald Hansen

- 1962 "Families in Disaster." Pp. 185-221 in George Baker and Dwight Chapman (eds.), *Man and Society in Disaster*. New York: Basic Books Inc.

Janis, Irving L.

- 1958 *Psychological Stress*. New York: John Wiley & Sons, Inc.

Kara, Gail

- 1975A "Older Person's Acceptance of Agency Assistance Following a Tornado." *Gerontology Program, University of Nebraska at Omaha*.
- 1975B "Disaster Preparedness Planning." Pp. 101-124 in Bill Bell et al., *Service Priorities for the Elderly in Natural Disasters: A Research Report*. Gerontology Program, University of Nebraska at Omaha.
- 1975C "Service Provider Insights." Pp. 63-74 in Bill Bell et al., *Service Priorities for the Elderly in Natural Disasters: A Research Report*. Gerontology Program, University of Nebraska at Omaha.

Killian, Lewis M.

- 1954 "Some Accomplishments and Some Needs in Disaster Study." *Journal of Social Issues* Vol. 10, No. 3: 66-72

- Levi, Lennart
1967 Stress. New York: Liveright Publishing Corp.
- Litwak, Eugene
1960A "Geographic Mobility and Extended Family Cohesion."
American Sociological Review Vol. 25, No. 3:385-394.
1960B "Occupational Mobility and Extended Family Cohesion."
American Sociological Review Vol. 25, No. 1:9-21.
- Parad, Howard J., and Gerald Caplan
1960 "A Framework for Studying Families in Crisis."
Social Work Vol. 5, No. 3:3-15.
- Parsons, Talcott
1959 "The Social Structure of the Family." Pp. 173-
201 in Ruth Anshen (ed.), The Family: Its Function
and Destiny. New York: Harper.
- Quarantelli, Enrico L.
1960 "A Note on the Protective Function of the Family in
Disasters." Marriage and Family Living 22 (August):
263-264.
- Sussman, Marvin
1953 "The Help Pattern in the Middle Class Family."
American Sociological Review Vol. 18, No. 1:22-25.
1960 "Intergenerational Family Relationships and Social
Role in Middle Age." Journal of Gerontology Vol. 15,
No. 1:71-75.
1965 "Relationships of Adult Children with their Parents
in the United States." Pp. 69-92 in Ethel Shanas
and Gordon Streib (eds.), Social Structure and the
Family Generational Relations. New Jersey:
Prentice Hall, Inc.
- Wallace, A. F. C.
1956 Tornado in Worcester: An Exploratory Study of
Individual and Community Behavior in an Extreme
Situation. Disaster Study #3. Washington: Nat-
ional Academy of Sciences, National Research Council.
- Winch, Robert
1952 The Modern Family. New York: Holt and Co.