

RESPONSE OF THE HEALTH CARE WORKER TO FAMILY-  
COMMUNITY ROLE CONFLICT IN DISASTER AND THE  
PSYCHOLOGICAL CONSEQUENCES OF RESOLUTION

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## CHAPTER I

### THE PROBLEM

#### Significance of the Study

As a field of scientific inquiry, the study of behavior of people under stress, particularly in psychological aspects, is relatively new. Although there are few systematic documentations or evaluations of the nature, scope and duration of psychological stress to disaster victims, there is abundant evidence in reports from various health agencies and disaster relief organizations that a problem does exist.<sup>1</sup> As the security of the individual is threatened, psychological stress results.

In order to better understand and predict individual responses to disaster there must be research and utilization of the research. In the United States today there are many governmental and private research centers specializing in some aspect of disaster relief

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<sup>1</sup>U.S., Office of Emergency Preparedness, "Psychological Effects of Disaster," Report to participants of Conference on the Psychological Effects of Disaster, Washington, D.C., 16 March 1973, p. 1.

research, but only a few support behavioral science research.<sup>2</sup>

Although the charter of the American National Red Cross, since 1905, has carried a responsibility for disaster relief, support of research has largely been limited to the analysis of Red Cross operations. Now, with the trend toward behavioral science research, there is an expressed interest in utilizing research findings to diminish the psychological consequences of disaster.<sup>3</sup>

Disaster refers to a "relatively sudden and violent disruption of the social system of a community, caused by some external agent or event over which those involved have little or no control."<sup>4</sup> Further defined by the United States government, major disaster means:

Any hurricane, tornado, storm, flood, high water, wind-driven water, tidal wave, earthquake, drought, fire, or other catastrophe in any part of the United States, which, in the determination of the President, is or threatens to be of sufficient severity and magnitude to warrant disaster assistance by the Federal Government to

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<sup>2</sup>U.S., Office of Emergency Preparedness, Report to the Congress: Disaster Preparedness, 1973, p. 150.

<sup>3</sup>Interview with Jeanne Durr, American National Red Cross, Washington, D.C., 27 October 1973.

<sup>4</sup>Canada, Department of National Health and Welfare, Management of Human Behavior in Disaster, p. 11.

supplement the efforts and available resources of States, local governments, and relief organizations.<sup>5</sup>

Although neither of these definitions include individual loss of life or personal injury, one can assume that with such destruction this is likely to occur. Psychological stress is also likely to be manifested during time of disaster.

Individual mental stress has taken various forms in past disasters. In the San Fernando Valley earthquake, many children suffered from fears, phobias, sleep disturbance, and nightmares long after the incident.<sup>6</sup> Among the aged in the flooded Wyoming Valley area of Pennsylvania, the emotional response was one of depression and despair from having lost homes and being uprooted from familiar surroundings.<sup>7</sup> Although not as pronounced and evident as in these particular age groups, individuals of all ages and station in life experience varying degrees of stress and despair.

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<sup>5</sup>U.S., Congress, An Act to Review and Expand Federal Programs for Relief from the Effects of Major Disasters, and for Other Purposes, Public Law 91-606, 91st Cong., S. 3619, 1970, p. 1.

<sup>6</sup>Stephen J. Howard, "Treatment of Children's Reactions to the 1971 Earthquake," paper presented to the American Association of Psychiatric Services, Beverly Hills, California, 1971, p. 9.

<sup>7</sup>Edward M. Whalen, "Observations of the June 1972 Flood in the Wyoming Valley Area of Pennsylvania," paper presented at the Office of Emergency Preparedness Conference on the Psychological Effects of Disaster, Washington, D.C., 26 October 1972.

Health care workers, by virtue of their training and occupation, are looked upon by the community as having responsible roles in disaster. They are ordinarily expected to help in emergencies for they are perceived by laity and medical personnel alike as the most competent group to deal with crises. Although subject to the same emotional trauma as the general population, health care workers must continue to function in their roles yet maintain psychological stability.

Considering the community expectations of the health care worker, what happens to the worker's family responsibility? Should the health care worker assume the community role over his family role? If the worker does not first determine his family's safety, would not this added stress result in increased psychological reactions?

#### Statement of the Problem

The study was designed to determine if health care professionals choose their family roles or their community roles during disaster and what the psychological consequences of their choice are.

### Purposes of the Study

The purposes of this study were: (1) to determine the response of the health care worker to family-community role conflict in disaster; (2) to conduct psychiatric status examinations on disaster workers; (3) to identify the psychological impact of the family-community role conflict on the worker; and (4) to validate the need for outside agencies, such as American Red Cross, to provide immediate emergency action for service to disaster victims and workers.

### Hypotheses

The following hypotheses were tested:

Hypothesis One: During time of disaster, health care workers will choose proportionally the same between their family and community roles.

Hypothesis Two: During time of disaster, there will be no difference in level of psychological stress among health care workers with role conflict who choose either the family or community role first and health care workers with no role conflict.

Hypothesis Three: During time of disaster, there will be no difference in level of psychological stress among Red Cross workers

from outside the disaster area and health care workers from within the disaster area.

Hypothesis Four: During time of disaster, there will be no difference in level of psychological stress in health care workers or Red Cross workers as a function of occupation.

Hypothesis Five: During time of disaster, the various combinations of role and type of occupation will not result in differences in psychological stress in health care workers or Red Cross workers.

#### Definition of Terms

For the purpose of this study, the following definitions are used:

Time of disaster: refers to the data collecting period of this study which was from one to twelve days after the tornado.

Psychological stress: as evaluated with the Psychiatric Status Schedule, psychological stress is determined by the summary symptom and role impairment scores. The higher the score, the greater is the level of stress.

Health care worker: an individual who, in his occupational role, provides direct or indirect care services.



Registered Nurse (R.N.): a person who holds a valid license to practice the profession of nursing.

Health care worker, other: refers to any type of health care worker other than a registered nurse.

Red Cross worker: trained volunteer or American Red Cross staff.

Family-community role conflict: refers to the forced choice that must be made by individual family members who have well-defined and important disaster roles in the community, such as health care work.

#### Limitations

Some limitations of this study were recognized, most noticeable of which concerned sample selection. As the disaster was not predictable for time or place, the subjects could not be obtained before the disaster occurred. Therefore, conclusions were drawn without the benefit of comparison to pre-impact data. Another problem was that the subjects could not be randomly assigned, for only the health care workers and Red Cross workers were crucial to the study. To increase the strength of the sample population, all of the health care workers and Red Cross workers the researcher could locate and interview in a twelve-day period were included.

The difficult problem of recall for victims was diminished because details of the disaster were not the data needed for this study. Also, the researcher did not experience any difficulty in establishing rapport with the workers, even though they may have been victims themselves.

A positive factor was that the researcher was "on call" to do disaster research and thus was in the disaster area within twenty-four hours with a planned research design and valid tool with which to collect data.

#### Preview of Chapters

Chapter I introduced the study. In Chapter II a survey of the relevant literature will be discussed. General content related to disasters will be presented first; then the psychological reactions by specific type of disaster will be related for comparison. The last section is concerned with the effect of disaster on the worker. A description of the method used in this study is given in Chapter III. Chapter IV contains an analysis of data and tests of the hypotheses. The interpretation of the findings, conclusions, and recommendations for further study are included in the final chapter, Chapter V.

## CHAPTER II

### SURVEY OF THE LITERATURE

The literature was reviewed for research findings regarding the health care worker in disaster. This was met with little success, however, as there are few published studies in this specific area. The researcher did find a considerable number of reports on the victim's reaction to disaster. Since in this research the worker was also the victim, it seemed appropriate to review those studies as well. Findings from the general studies, along with the specific accounts of the disaster worker, served as the foundation to this research.

#### Behavioral Response in Disaster

It is generally accepted that disasters produce stress in the individual. What determines when and how the individual reacts to the stress cannot be so easily predicted.

Hocking<sup>8</sup> agrees that constitutional factors and childhood experiences are important when considering the reactions of

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<sup>8</sup> Frederick Hocking, "Psychiatric Aspects of Extreme Environmental Stress," Diseases of the Nervous System, 31 (August 1970): 543.

individuals to the ordinary stress of life, but he believes that when "the duration and degree of stress are severe, pre-existing personality characteristics do little more than determine how long an individual can tolerate the situation before the onset of neurotic symptoms."<sup>9</sup> Thus, if the external stress (such as a community disaster) is great enough, any individual will develop neurotic symptoms or maladaptive behavior.

The tsumani study of Lachman, Taksuoka, and Bonk<sup>10</sup> ruled out, or at least relegated to a minimum role, education and previous disaster experience as determinants of adaptive behavior. The major stress identified was ambiguous communication with respect to the danger.

Nutritional status has sometimes been linked to the individual's psychological coping ability. It was found that the prisoner-of-war in Japanese camps during the Second World War had his most difficult psychological problems during periods of malnutrition.<sup>11</sup>

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<sup>9</sup>Ibid.

<sup>10</sup>Roy Lachman, Maurice Tatsuoka, and Wildran Bonk, "Human Behavior during the Tsumami of May 1960," Science, 133 (May 1961): 1405-9.

<sup>11</sup>Hocking, p. 543.

The severity of symptoms was also found to be related to the hardship of imprisonment, head injuries, and physical illnesses. Nearly all of the prisoners had strong feelings of guilt when they were freed. They blamed themselves for not helping others as they felt they should.

There are five types of reactions to disaster.<sup>12</sup> These are: normal reactions (natural and temporary), individual panic (blind flight), depressed reactions (slowed down, numbed), overactive responses (largely useless flurry of activity), and bodily reactions (physiological manifestations). A disaster victim may exhibit features of more than one type of reaction, either simultaneously or in successive periods.

The frequency of panic has been over-exaggerated. The major impressions people have about behavior in disaster come from news stories, and what is reported is often misrepresentative.<sup>13</sup> Many preconceived ideas about behavior in disaster, including panic reactions, have been found untrue.

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<sup>12</sup> American Psychiatric Association, First Aid for Psychological Reactions in Disaster (Washington, D. C.: American Psychiatric Association, 1966), pp. 12-15.

<sup>13</sup> Enrico L. Quarantelli and Russel R. Dynes, "When Disaster Strikes (It Isn't Much Like What You've Heard and Read About)," Psychology Today (February 1972), pp. 67-70.

Based on data from eleven disasters, Quarantelli<sup>14</sup> says panic is always oriented with reference to the threatening situation, as in running away from a collapsed building. However, one may run toward danger if escape lies in the same direction, as in running through a sheet of fire to an exit. Panic is seen as an adaptive action with no consideration of alternate courses of action.

A condition that contributes to panic is when the crisis is defined as likely to cause panic, such as with a fire in a crowded place.<sup>15</sup> Specifically for the individual, panic is more likely to occur when he feels that he cannot escape from an impending threat.

Tyhurst sees psychiatric phenomena as a cross-section in a process, and thus proposes a time model to further the understanding of the significance of the behavior observed in disaster. He identified psychological reactions specific to each time period as follows:<sup>16</sup>

At the period of impact, 12 to 25 per cent of the people remain cool and collected, 75 per cent have normal reactions of

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<sup>14</sup> Enrico L. Quarantelli, "The Nature and Conditions of Panic," American Journal of Sociology, 60 (November 1954): 267-275.

<sup>15</sup> Ibid.

<sup>16</sup> J.S. Tyhurst, "Individual Reactions to Community Disaster," American Journal of Psychiatry, 107 (April 1951): 761-769.

stunned bewilderment with automatic behavior, and 12 per cent become hysterical and very anxious.

During the period of recoil, when initial stress is over, there is increased dependency manifested with the need to ventilate and be given something (a blanket or coffee will do).

The post-traumatic period theoretically lasts the remainder of the individual's life. Psychological phenomena observed during this period are temporary anxiety, fatigue states, psychotic episodes, recurrent nightmares, and depression.

A more definitive seven-phase time model was proposed by Powell and Rayner. It is as follows: warning, threat, impact, inventory, rescue, remedy, and recovery.<sup>17</sup>

In general, people handle their anxiety effectively during the warning period but occasionally there are extreme reactions. These reactions continue into the threat stage. During the impact, if there are individuals panicking, it usually does not have much group significance. Instead, high group morale and cohesiveness usually develop.

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<sup>17</sup>J.W. Powell and Jeannette Rayner, Progress Notes: Disaster Investigations, July 1, 1951 - June 30, 1952, as cited in Leona Grossman, "Train Crash: Social Work and Disaster Services," Social Work, 18 (September 1973): 39.

The victim becomes aware of the destruction for the first time in the inventory phase. There is a concern and warmth for other survivors. Searching for one's own family is urgently begun.

The rescue phase brings in outside help as well as professional mobilization from the community. Long-term rebuilding and grieving begin in the remedy period. Usually this is a time of strong community morale.

There is not much known about psychological reactions in the recovery period. Probably there is an increased sensitivity to death and religion as the result of major losses incurred in disaster.

#### Reactions to Specific Types of Disaster

The California earthquake in 1971 resulted in a psychological disaster for a large number of children.<sup>18</sup> Hundreds of parents and children called the Child Guidance Clinic for help. The calls received were about children clinging to their parents, unwilling to leave their sides, unwilling to leave the house, reacting to noises, reverting to earlier behavior like bed-wetting, fears of going into the rooms alone, and fears of returning to their beds and bedrooms to go

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<sup>18</sup>Howard, p. 2.



to sleep. It was highly disturbing to the children for their houses to shake and go dark with the disruption of electrical service.

Fogelman and Parenton report their observation of behavior after Hurricane Audrey.<sup>19</sup> A number of the people thought the end of the world had come, but they appeared reconciled. Others said they felt they were doomed to die, but struggled to prevent it. There was no evidence of serious emotional disorders that could be associated with the disaster. Behavior was primarily family oriented, including the extended family. After the initial shock subsided, clean-up and rebuilding began. Community morale and cohesiveness was high.

Morale also remained high after Hurricane Camille in Biloxi, Mississippi.<sup>20</sup> As evidence of this, 6,000 flags flew in front of ruined homes and businesses as a symbol of the will to recover. Individual emotional disturbances were almost totally absent. There were a few cases of depression that could be storm related and some

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<sup>19</sup>Charles W. Fogelman and Vernon Parenton, "Individual and Group Behavior in Critical Situations," Social Forces, 38 (December 1959): 129-135.

<sup>20</sup>Robert McHugh, "Observations Related to Hurricane Camille," paper presented at the Office of Emergency Preparedness Conference on the Psychological Effects of Disaster, Washington, D.C., 26 October 1972, p. 2.

cases of psychosomatic stomach aches, head aches, and other vague complaints.

Tornadoes vary in destruction according to how long and where they are on the ground. The suddenness and speed of a tornado adds to the stress, seeming to magnify the reactions. Moore, in his studies of tornadoes in Texas, was concerned that there are residual emotional effects of disasters.<sup>21</sup> In the Waco-San Angelo study, four months following the tornado, 85 per cent of the Negro families and 53 per cent of the white families reported some member of the family showing fear of unusual weather conditions. When asked if emotional upset was observed in any member of the family, 17 per cent of the Negro families said yes and 30 per cent of the white families said yes.

In the Dallas tornado study, the disaster victims were found to be deeply concerned about the welfare of family members.<sup>22</sup> Their activities were strongly oriented toward their relatives. The report concluded that "the threat to the immediate family, certainly the most

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<sup>21</sup>Harry Estill Moore, Tornadoes over Texas (Austin: University of Texas Press, 1958).

<sup>22</sup>Harry Estill Moore and H.J. Friedman, "Reported Emotional Stress Following a Disaster," Social Forum, 38 (December 1959): 135-139.

intense of all threats experienced by disaster victims, also leave its precipitate in long-run stress."<sup>23</sup>

Lynch discussed the concern of disaster victims for their family members in another Texas tornado study.<sup>24</sup> He told of a construction worker who drove over two hundred miles to determine his wife's safety. As Lynch stated, "Individuals who fear for the safety of a loved one are more likely to experience emotional upset than victims and survivors."<sup>25</sup>

The following problems were identified in the Greater Harrisburg Area, Pennsylvania, following the flood caused by Hurricane Agnes.<sup>26</sup> Of two thousand families reached through door-to-door contact, 2 per cent needed referral for emotional support. Emotional upsets seemed to appear chiefly in physical symptoms. For a number of people, the flood losses were one more difficulty added to other existing ones with which an individual could not cope.

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<sup>23</sup>Ibid., p. 138.

<sup>24</sup>Dudley Lynch, Tornadoes, Texas Demon in the Wind (Waco, Texas: Texican Press, 1970).

<sup>25</sup>Ibid., p. 100.

<sup>26</sup>"Fact Sheet--Post Flood Problems," distributed at the Offices of Emergency Preparedness Conference on the Psychological Effects of Disaster, Washington, D.C., 26 October 1972 (typewritten).

The largest group needing emotional support were the elderly, although they denied emotional problems. Many were emotionally immobilized. They could not accept loss of sentimental items, and had feelings of hopelessness.

Whalen noticed a pattern of scapegoating in the flooded Wyoming Valley area in Pennsylvania.<sup>27</sup> Although some families resorted to their usual pattern and found a scapegoat in their family, a large number made a Federal government agency, HUD, the scapegoat. The expressions of anger toward HUD may have actually prevented angry acting out of individuals toward members of their family or neighbors. By these various normal coping mechanisms of mutual support and ventilation, most people adapted.

Drabek found that 93 per cent of the families who left Denver left together in the face of an immediate flood threat in 1965. Forty-two per cent of these families stayed with relatives, 3.5 per cent stayed in an organized shelter, and the rest "went up on a hill."<sup>28</sup> This study further suggests the importance of kinship ties, even in the urban community.

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<sup>27</sup>Whalen, p. 4.

<sup>28</sup>Thomas Drabek and Keith Boggs, "Families in Disaster," Journal of Marriage and the Family, 30 (August 1968): 447.

Effect of Disaster on the Worker

Medical personnel are expected to maintain composure in any type of stress situation although they may be exposed to suffering, pain and death. According to Coombs and Goldman, they develop "detached concern," which is the ability to care for the critically ill, yet maintain an acceptable emotional detachment.<sup>29</sup>

Not all reports about the worker in disaster are positive. Lifton found, in his study of the survivors of Hiroshima,<sup>30</sup> many strong negative feelings in the relief worker, such as fear, anger, hatred, and resentment. These feelings resulted in disruption of team functioning, thus hindering the necessary relief work.

Rayner found that nurses continue to function effectively in disaster, even though they experience strong emotional responses.<sup>31</sup> She identified two types of role conflict, nurse-mother and nurse-

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<sup>29</sup>Robert H. Coombs and Lawrence J. Goldman, "Maintenance and Discontinuity of Coping Mechanisms in an Intensive Care Unit," Social Problems, 20 (Winter 1973).

<sup>30</sup>Robert J. Lifton, "Psychological Effects of the Atomic Bomb in Hiroshima," in Death and Identity, ed. by Robert Fulton (New York: John Wiley and Sons, 1965), pp. 9-42.

<sup>31</sup>Jeannette Rayner, "How Do Nurses Behave in Disaster?" Nursing Outlook, 6 (October 1958): 573.

doctor, as responsible for the emotional difficulties experienced by the nurse.

In Laube's study of the Celia disaster, most of the nurses coped with their anxiety without impairment of their professional role.<sup>32</sup> However, there were nurses who left work or did not report for duty during the disaster period. Major stresses identified by the nurses were excessive physical demands, concern for own or patients' safety, inadequate supplies, seeing the poor suffer, hurt children, the disorganization, and concern for own family's welfare.<sup>33</sup>

Shader and Schwartz believe professional people, such as doctors and nurses, begin to function in a disaster sooner than the untrained.<sup>34</sup> However, they agreed that family roles are intensified in the inventory phase of disaster, with family loyalty a strong force in human behavior. This is also borne out in Feld's reflections on the

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<sup>32</sup>Jerri Laube, "Psychological Reactions of Nurses in Disaster," Nursing Research, 22 (July-August 1973): 343-347.

<sup>33</sup>*Ibid.*, p. 345.

<sup>34</sup>Richard L. Shader and Alice J. Schwartz, "Management of Reactions to Disaster," Social Work, 11 (April 1966): 99-104.

Agnes flood.<sup>35</sup> In his words, he was "a flood victim who happens to be a social worker."<sup>36</sup> Apparently Feld directed all of his energy to his family role as he made no remarks about assuming any type of community role.

Although Hill and Hansen have a theoretical framework for viewing families in crisis,<sup>37</sup> this has not been applied to crisis in disaster. There is much work yet to be done before it is known how disaster affects families and how families and individual family members react in disaster. A suggested proposition for study, as identified by Hill and Hansen, is: "Individual family members who have well-defined disaster roles in the community will experience role conflict between family roles and community roles."<sup>38</sup>

Kin relations are very important in disaster. It is believed that if the individual has any doubt concerning his family's safety, he will choose the family role instead of the community role.

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<sup>35</sup>Allen Feld, "Reflections on the Agnes Flood," Social Work, 18 (September 1973):46-51.

<sup>36</sup>*Ibid.*, p. 46.

<sup>37</sup>Reuben Hill and Donald Hansen, "Families in Disaster," in Man and Society in Disaster, ed. by G.W. Baker and D.W. Chapman (New York: Basic Books, 1962), p. 194.

<sup>38</sup>*Ibid.*, p. 211.

Furthermore, even if the individual's family is safe, choosing in favor of his community role may endanger the family's adjustive capacity.<sup>39</sup>

In summary, this review of literature suggests that although medical and nursing personnel may be expected to always function effectively in a period of disaster, this cannot be assured. Individuals differ in their reactions, depending more on type and duration of stress than on education, experience or pre-disaster personality. Typical reactions to disaster include shock and disbelief, apathy, sleep disturbances, irritability, somatic distress, and over-dependency. Long-term psychological effects have not been substantially documented.

Family roles are important, particularly during times of crisis such as in disaster. Health care workers, who are also from the disaster area, have an exceptional amount of stress, for they must not only work through their own reactions to the disaster, they must resolve the family-community role conflict.

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<sup>39</sup>Ibid.



## CHAPTER III

### METHOD

#### Type of Research

An ex post facto, quasi-experimental research approach was used in this study. Ex post facto research is defined as:

. . . research in which the independent variable or variables have already occurred and in which the researcher starts with the observation of a dependent variable or variables. He then studies the independent variables in retrospect for their possible relations to, and effects on, the dependent variable or variables.<sup>40</sup>

Although ex post facto research has some major weaknesses, which have already been discussed in Chapter I, if the research is conducted with hypotheses, the results are more valid than if there are no hypotheses or predictions.<sup>41</sup> The value of ex post facto research is its use when variables cannot be manipulated. Many research problems in the social sciences do not lend themselves to experimental inquiry. This is particularly true in disaster research,

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<sup>40</sup>Fred N. Kerlinger, Foundations of Behavioral Research (New York: Holt, Rinehart and Winston, Inc., 1967), p. 360.

<sup>41</sup>Ibid., p. 372.

for, as Drabek states: "Experimental manipulation through random assignment to 'treatment groups,' and most control procedures are inappropriate, unethical, or simply impossible."<sup>42</sup>

### The Research Design

A mixed design was used in this study, incorporating a survey approach and an ex post facto, quasi-experimental approach. Determination of the health care worker's family-community role conflict and subsequent resolution was obtained in a survey. This data was then incorporated into a three-group, quasi-experimental design (see fig. A). The explanatory variables were the independent variable, family-community role conflict, and the dependent variable, psychological stress.

In the comparison of the Red Cross worker's level of psychological stress with the health care worker's level of psychological stress, the independent variable was place of residence, and the dependent variable was psychological stress (see fig. B).

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<sup>42</sup>Thomas E. Drabek, "Methodology of Studying Disasters: Past Patterns and Future Possibilities," American Behavioral Scientist, 13 (January-February 1970): 331.

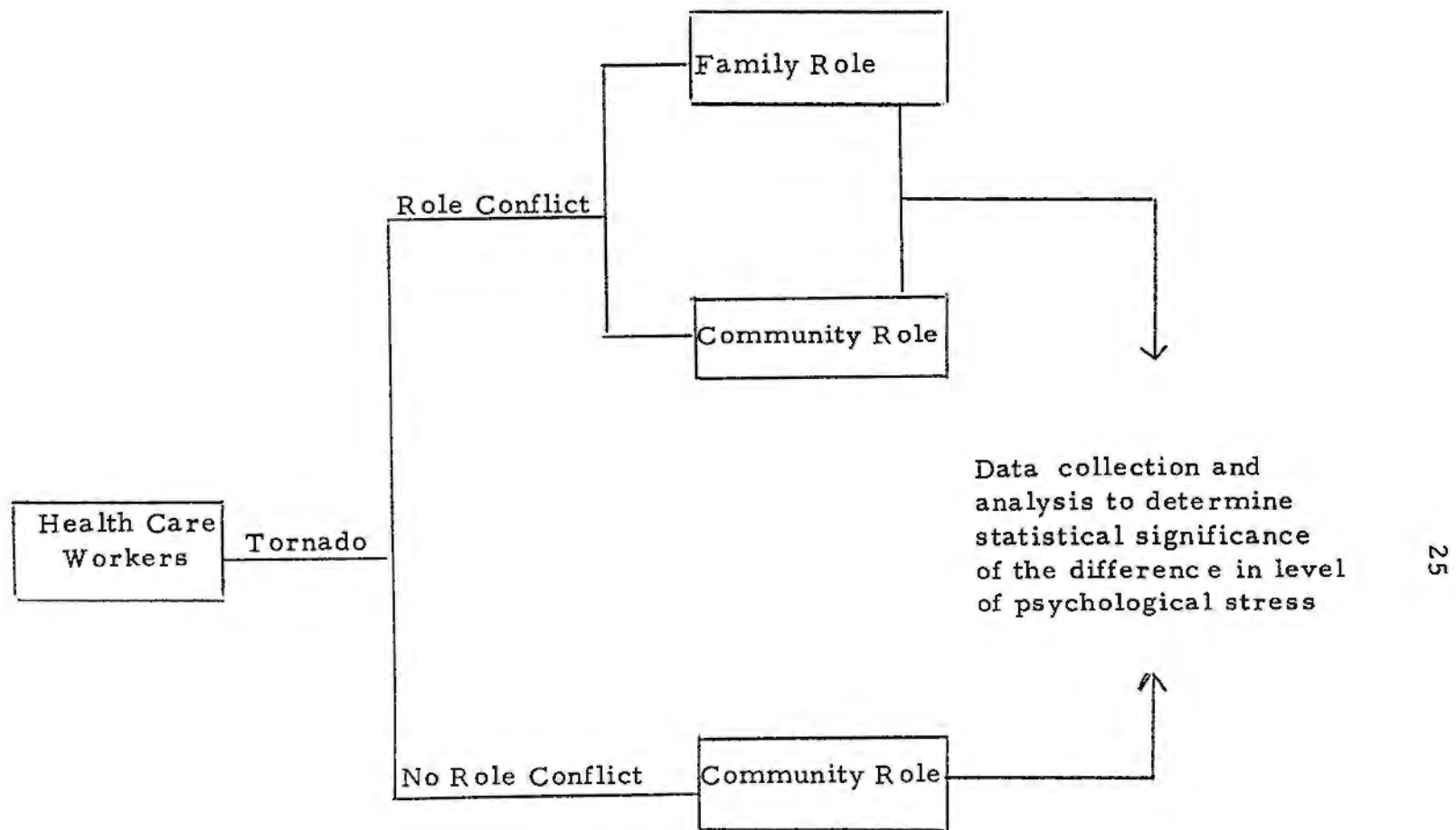


Fig. A. The Research Design Employed to Compare Health Care Workers

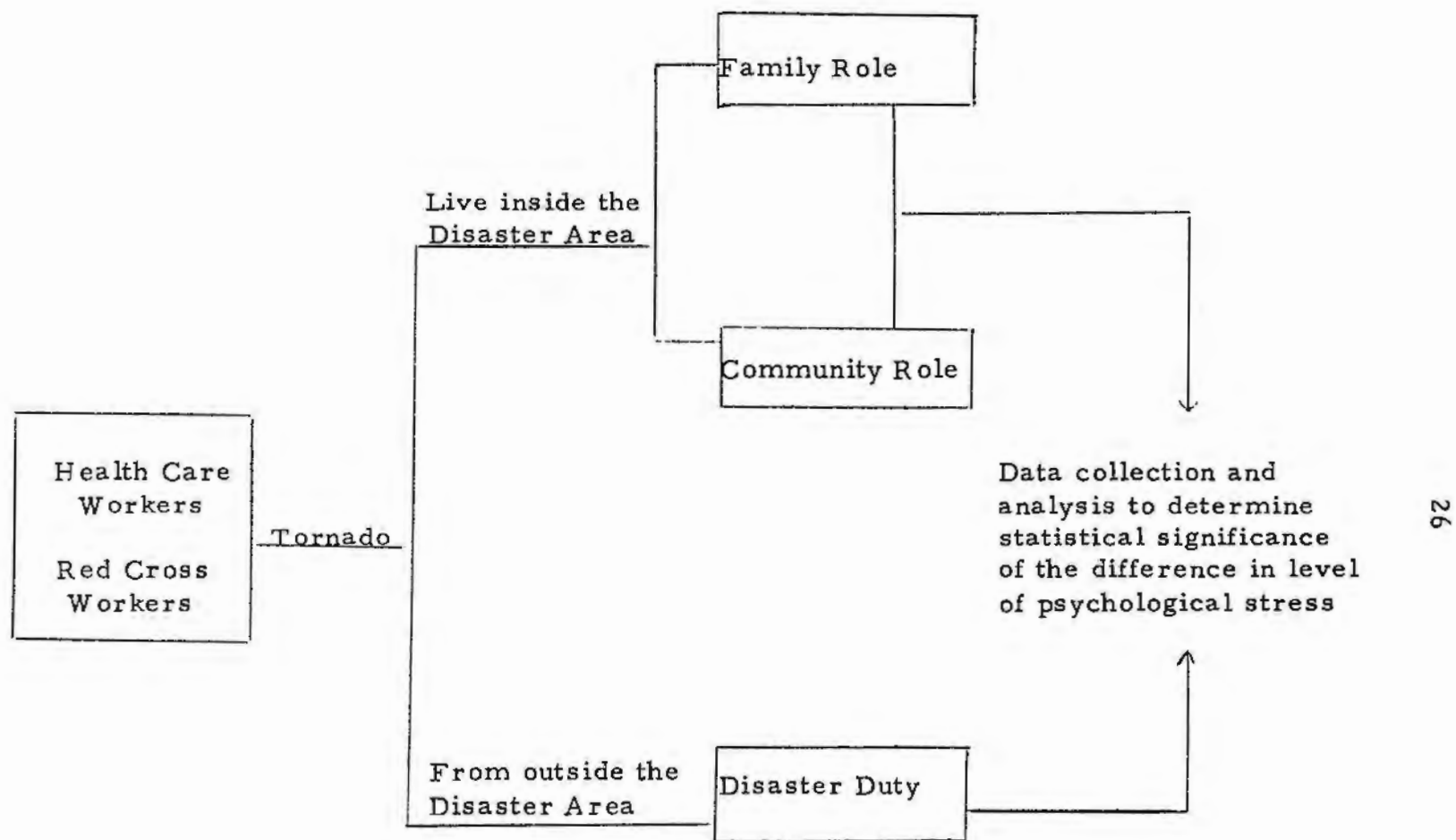


Fig. B. The Research Design Employed to Compare Health Care Workers and Red Cross Workers

### Selection of Research Tool

The success of a study is dependent upon how well the various steps in the research process have been formulated. The most important step in this process, yet often the weakest, is the definition and measurement of the variables in the study. After careful deliberation, the Psychiatric Status Schedule, with items added for gathering information relating specifically to the disaster, was chosen as the research tool for this study.

The criteria used for selection of this tool were that the tool should be (1) easily administered, (2) yielding of data that could be examined, (3) valid, and (4) reliable.

The Psychiatric Status Schedule (PSS) is a standardized interview schedule for gathering information needed to complete a matching inventory designed to evaluate a subject's social functioning, role functioning, and mental status. Two levels of scores are obtained. The first level consists of seventeen symptom and six role scales. The second level summarizes the first level scales into four symptom scales and one role scale (see Table 1).<sup>43</sup>

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<sup>43</sup>Robert L. Spitzer et al., "The Psychiatric Status Schedule," Archives of General Psychiatry, 23 (July 1970): 41.

TABLE 1

BASIC SCORING SYSTEM OF THE PSYCHIATRIC STATUS SCHEDULE

	First Level	Second Level (Summary Symptom and Role Scales)
Symptom Scales	Depression--Anxiety	Subjective Distress
	Daily Routine--Leisure Time Impairment	
	Social Isolation	
	Suicide--Self Mutilation	
	Somatic Concern	
	Speech Disorganization	Behavioral Disturbance
	Inappropriate Affect, Appearance, Behavior	
	Agitation--Excitement	
	Interview Belligerence--Negativism	
	Disorientation--Memory	Impulse Control Disturbance
	Retardation--Lack of Emotion	
	Antisocial Impulses or Acts	
	Drug Abuse	Reality Testing Disturbance
	Reported Overt Anger	
Role Scales	Grandiosity	Summary Role
	Suspicion--Persecution--Hallucinations	
	Alcohol Abuse	Summary Role
	Denial of Illness	
	Wage Earner Role	
	Housekeeper Role	
	Student or Trainee Role	
	Main Role	
	Parent Role	

SOURCE: Robert L. Spitzer, Jean Endicott, Joseph L. Fleiss, and Jacob Cohen, The Psychiatric Status Schedule, 23 July 1970, p. 45, Table 3.

For tabulating and analysis, the researcher used the second level scales--subjective distress, behavioral disturbance, impulse control disturbance, reality testing disturbance, and summary role. In addition, a total score is computed.

Validity and reliability studies of the PSS indicate acceptable coefficient levels.<sup>44</sup> The internal consistencies of the four summary scales range from 0.80 to 0.89.<sup>45</sup> Inter-judge reliability coefficients range from 0.90 to 0.98 for the four summary symptom scales and 0.94 for the summary role scale.<sup>46</sup>

Validity studies were based on: (1) correlations between the PSS scales and similar items from other instruments; (2) data from populations expected to differ on various dimensions; and (3) demonstration of expected changes in psychopathology in the same subjects at different points in time. The findings of these studies support the use of the PSS in research.<sup>47</sup>

Face sheet information, obtained at the beginning of the interview, included: sex, marital status, education, occupation,

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<sup>44</sup>Ibid., pp. 41-46.

<sup>45</sup>Ibid., p. 46.

<sup>46</sup>Ibid., p. 48.

<sup>47</sup>Ibid., pp. 46-51.

religious preference, race, and the head of the household's occupation and education. Such information was used in checking the adequacy of samples.

The additional items, aimed at the various facts of the problem, included the following: (1) family characteristics, e.g., family constellation, family responsibility, health of family members; (2) subject's behavior in the disaster, e.g., where he was at impact, when he determined the welfare of his family and condition of his home, when he first reported for duty or began rescue operations, number of continuous hours worked without rest; and (3) subject's attitude toward his experience with disaster, e.g., was his loss greater than those of his neighbors, how he saw his community role, major stress experienced, and how he coped with his stress.

As in Laube's interview schedule,<sup>48</sup> the interviews were closed with the question, "What is the funniest thing that has happened during this disaster?" in order to lessen any anxiety that may have been aroused in the course of the interview.

### The Population

Some researchers make a distinction between the "target population" and the "sampled population." Abdellah and Levine

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<sup>48</sup>Laube, p. 344.



state, "The target population is considered to be the entire population to whom the findings of the study are held to be applicable while the sampled population is considered to be the aggregate of all the identifiable sampling units from which the study subjects were actually drawn."<sup>49</sup> As there is a high risk of improper interpretation in ex post facto research, the two populations, sample and target, were identical in this study. The population referred to health care workers and Red Cross workers in a disaster-struck community.

The sample. The sample was comprised of thirty-eight Red Cross workers, twenty-one volunteers and seventeen staff, and 101 health care workers, forty-nine registered nurses and fifty-two others. The disaster-struck community was in the midwestern part of the United States and had a population of 22,700.

It was not possible for the researcher to assign subjects to the groups. Instead, the subjects "selected themselves" into groups on the basis of being a health care worker or Red Cross worker in a disaster area. Furthermore, the experimental groups, the health care workers, assigned themselves to their specific group by virtue of their family-community role conflict.

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<sup>49</sup>Faye G. Abdellah and Eugene Levine, Better Patient Care through Nursing Research (New York: The Macmillan Co., 1965), p. 292.

Two different control groups were used according to data compiled. Health care workers from the disaster area, but without family responsibility and thus no role-conflict, were used in one analysis. Red Cross workers from outside the disaster area were used in another analysis.

#### Collection of Data

The researcher received a letter of introduction from the American Red Cross Chapter disaster headquarters. This letter served as a pass into the disaster area and insured cooperation in the Red Cross centers and shelters. To interview subjects in the community hospital, permission was obtained from the administrator and director of nursing service. Permission was granted from the medical director and director of nursing service to interview also in the County Health Department. In addition, the researcher received permission to interview from each worker who participated in the study.

The researcher went into the disaster area for eleven consecutive days, eight to ten hours each, conducting personal interviews on all available, consenting health care workers and Red Cross workers. Workers from each duty shift were contacted as the

researcher arranged her hours to coincide with the various schedules. The Red Cross staff were interviewed at the American Red Cross Chapter disaster headquarters in a nearby city. Interviews were held two to twelve days past impact of the tornado. Subjects were guaranteed anonymity.

#### Organization and Tabulation of the Data

The chi-square test<sup>50</sup> was used to establish whether the two variables, family responsibility and role choice, were related (see fig. C). The values in the table cells were the count of persons in each category.

Five different chi-square tests were run, one for each of the following classifications: health care workers (total); health care workers, other; R.N.'s; health care workers, men; and health care workers, women.

When the chi-square tests indicated a relationship, the contingency coefficient was computed to give an indication of the degree of relationship. Level of significance was accepted at the .05 level.

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<sup>50</sup>James L. Brunning and B.L. Kintz, Computational Handbook of Statistics (Glenview, Illinois: Scott, Foresman and Co., 1968), pp. 207-209.

	B <sub>1</sub>	B <sub>2</sub>
A <sub>1</sub>	A <sub>1</sub> B <sub>1</sub>	A <sub>1</sub> B <sub>2</sub>
A <sub>2</sub>	A <sub>2</sub> B <sub>1</sub>	A <sub>2</sub> B <sub>2</sub>

A<sub>1</sub> - Lives with family

A<sub>2</sub> - Lives alone

B<sub>1</sub> - Family role first

B<sub>2</sub> - Community role first

Fig. C. 2 X 2 Crossbreak

A one-way analysis of variance<sup>51</sup> was employed to determine the different effects of role choice on the health care workers. As the results were tabulated by five summary scales, there were five one-way analyses of variance.

To determine the significance of difference in the effect of role choice in combination with occupation, R.N. or other, a two-way analysis of variance<sup>52</sup> was computed for each of the summary scales.

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<sup>51</sup>Ibid., pp. 22-25.

<sup>52</sup>Ibid., pp. 25-30.

There were six independent groups with a range of seventeen to thirty-two per group (see fig. D). The several *F* ratios were obtained and the level of significance for each was acceptable at the 5 per cent level.

		Occupation	
		R. N. 's	Others
Role Choice	Family role		
	Community role		
	No conflict		

Fig. D. Two Factor: Six Group Analysis

To determine difference and similarities in the groups, the subjects were compared regarding age, marital status, education, occupation, family responsibility, and continuous hours worked. This was done by determining the percentage distribution of subjects for each factor.

#### The Event

The event that precipitated this study was a tornado that swept through Xenia, Ohio, a midwestern town in the United States, leaving a path of destruction one-fourth mile wide by fifteen miles

long. Winds had been clocked up to 212 miles per hour.

The following statistics were reported by the American Red Cross.<sup>53</sup> Thirty-four people were left dead. Seven hundred and eighty-five people were sent to hospitals for treatment, with 155 admitted. Red Cross shelters treated one hundred major injuries and at least four hundred minor injuries. Total number of homes damaged was 2,757, with 41 per cent destroyed, 25 per cent having major damage, and 31 per cent having minor damage. One hundred fifty businesses were destroyed and two hundred businesses received some sort of damage. Nine schools were severely damaged, and one college was 80 per cent destroyed. Three thousand families suffered some type of loss.

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<sup>53</sup>American Red Cross, "Survey Statistics," Dayton, Ohio, 5 April 1974 (typewritten).

## CHAPTER IV

### ANALYSIS AND INTERPRETATION OF DATA

An analysis of the data obtained by the methods described in the previous chapter is presented in this chapter. Selltiz states: "It is the purpose of analysis to summarize the completed observations in such a manner that they yield answers to the research questions."<sup>54</sup> The purpose of this analysis was to determine the response of the health care worker to family-community role conflict in disaster and the psychological consequences of resolution.

#### Test of the Hypotheses

Hypothesis One: During time of disaster, health care workers will choose proportionally the same between their family and community roles.

The hypothesis was rejected at the .05 level of significance for the total group of health care workers (see Table 2). Data analyzed for the registered nurses and health care workers, others, was similarly significant (see Tables 3 and 4). Due to the

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<sup>54</sup>Claire Selltiz, Research Methods in Social Relations (New York: Holt, Rinehart and Winston, 1964), p. 386.

disproportionate ratio of sex, the data was then reorganized for analysis by sex of health care worker. The hypothesis was rejected at the .05 level of significance for female health care workers (see

TABLE 2  
HEALTH CARE WORKERS BY CHOICE OF ROLE AND  
FAMILY RESPONSIBILITY

Family Responsibility	Family Role	Community Role
No	3 ( 3%)	14 (14%)
Yes	52 (53%)	27 (30%)

Note:  $\chi^2 = 10.54640$ , d.f. = 1,  $p = 0.0012$

TABLE 3  
HEALTH CARE WORKERS, OTHERS, BY CHOICE OF ROLE  
AND FAMILY RESPONSIBILITY

Family Responsibility	Family Role	Community Role
No	1 ( 2%)	8 (16%)
Yes	22 (44%)	19 (38%)

Note:  $\chi^2 = 3.8019$ , d.f. = 1,  $p = 0.0515$



Table 5). Data from the all male group revealed no significant difference (see Table 6). However it must be noted that as the frequency count fell below five in one cell of the contingency table for each analysis, the results are not strictly valid.

TABLE 4  
REGISTERED NURSES BY CHOICE OF ROLE AND  
FAMILY RESPONSIBILITY

Family Responsibility	Family Role	Community Role
No	2 (4%)	6 (12%)
Yes	30 (63%)	10 (21%)

Note:  $\chi^2 = 5.41875$ , d.f. = 1,  $p = 0.0201$

TABLE 5  
FEMALE HEALTH CARE WORKERS BY CHOICE OF ROLE AND  
FAMILY RESPONSIBILITY

Family Responsibility	Family Role	Community Role
No	3 (4%)	12 (15%)
Yes	45 (55%)	21 (26%)

Note:  $\chi^2 = 9.84154$ , d.f. = 1,  $p = 0.0018$

Of the total health care workers, 3 per cent of the workers lived alone and chose to stay home, 14 per cent of the workers lived alone and chose the community role, 53 per cent of the workers had family responsibilities and chose the family role, and 30 per cent of the workers had family responsibilities but chose the community role. All together, 56 per cent of the workers chose the family role and 45 per cent of the workers chose the community role (see Table 2).

TABLE 6

MALE HEALTH CARE WORKERS BY CHOICE OF ROLE AND  
FAMILY RESPONSIBILITY

Family Responsibility	Family Role	Community Role
No	0	2 (12 %)
Yes	7 (41 %)	8 (47 %)

Note:  $\chi^2 = 0.24488$ , d.f. = 1,  $p = 0.6208$

Considering only the registered nurses, 4 per cent lived alone and chose to stay home, 12 per cent lived alone and chose the community role, 63 per cent had family responsibilities and chose the family role, and 21 per cent had family responsibilities but chose the community role first. All included, 67 per cent of the registered nurses

chose the family role over the community role, and 33 per cent chose the community role (see Table 4).

For the health care workers, other than registered nurses, 2 per cent lived alone and chose to stay home, 16 per cent lived alone and chose the community role, 44 per cent had family responsibilities and chose the family role, and 38 per cent had family responsibilities but chose the community role. Thus, a total of 46 per cent of the health care workers, other than registered nurses, chose the community role (see Table 3).

Regrouping the sample population data by sex, analysis of the female health care workers revealed that 4 per cent lived alone and chose to stay home, 15 per cent lived alone and chose the community role, 50 per cent had family responsibilities and chose the family role, and 26 per cent had family responsibilities but chose the community role. For the total group, 59 per cent chose the family role and 41 per cent chose the community role (see Table 5).

Of the men health care workers, none who lived alone chose to stay home, 12 per cent who lived alone chose the community role, 41 per cent had family responsibilities and chose the family role, 47 per cent had family responsibilities but chose the community role. Thus, for this classification only, men health care workers, more

subjects chose the community role rather than the family role first (see Table 6).

Hypothesis Two: During time of disaster, there will be no difference in level of psychological stress among health care workers with role conflict who choose either the family or community role first and health care workers with no role conflict.

The hypothesis was rejected at the .05 level of significance on the basis of the "subjective distress" and "total" scales (see Tables 7 and 12).

TABLE 7

ANALYSIS OF VARIANCE FOR MEASUREMENT OF SUBJECTIVE  
DISTRESS OF HEALTH CARE WORKERS

Source	Sum of Squares	d.f.	Variance Estimate	F Ratio	p
Between types of role resolution	65.8694	2	34.9347	5.2981	0.0065
Within types of role resolution	646.1900	98	6.5938		
Total	716.0594	100			

The mean "total" and "subjective distress" scores on the PSS of health care workers with family responsibility were higher for those who chose the community role than for those who chose the family role first (see Table 13). The health care workers with no family responsibility had a mean "total" score on the PSS that ranked between the two experimental groups. All of the groups had lower mean scores than the standardized mean scores.

To determine which groups were significantly different, the Duncan's multiple-range test was used with the following results: Health care workers who chose the community role over the family role had a significantly higher "total" score on the PSS than health care workers who chose the family role first ( $p > .01$ ). No other significant differences were found with "total" scores (see Table 14).

At the .01 level of significance, health care workers who chose the community role over the family role had a significantly higher "subjective distress" scores on the PSS than health care workers who chose the family role first. No other significant differences were found in the "subjective distress" scale (see Table 15).

There was no significant difference in health care worker groups for the following summary scales: behavioral disturbance,

impulse control disturbance, reality testing disturbance, or role impairment (see Tables 8, 9, 10, 11).

TABLE 8

ANALYSIS OF VARIANCE FOR MEASUREMENT OF BEHAVIORAL  
DISTURBANCE OF HEALTH CARE WORKERS

Source	Sum of Squares	d.f.	Variance Estimate	F Ratio	p
Between types of role resolution	3.1038	2	1.5519	1.0602	0.3503*
Within types of role resolution	<u>143.4507</u>	<u>98</u>	1.4638		
Total	146.5545	100			

\* Not significant

Hypothesis Three: During time of disaster, there will be no difference in level of psychological stress among Red Cross workers from outside the disaster area and health care workers from the disaster area.

The hypothesis is rejected at the .01 level of significance on the basis of the "subjective distress" scale (see Tables 16 through 21).

TABLE 9

ANALYSIS OF VARIANCE FOR MEASUREMENT OF IMPULSE  
CONTROL OF HEALTH CARE WORKERS

Source	Sum of Squares	d.f.	Variance Estimate	F Ratio	p
Between types of role resolution	0.1921	2	0.0961	1.0798	0.3436*
Within types of role resolution	<u>8.7188</u>	<u>98</u>	0.0890		
Total	8.9109	100			

\* Not significant

TABLE 10

ANALYSIS OF VARIANCE FOR MEASUREMENT OF REALITY  
TESTING DISTURBANCE OF HEALTH CARE WORKERS

Source	Sum of Squares	d.f.	Variance Estimate	F Ratio	p
Between types of role resolution	0.0435	2	0.0219	0.2734	0.7614*
Within types of role resolution	<u>7.7981</u>	<u>98</u>	0.0796		
Total	7.8410	100			

\* Not significant

TABLE 11

ANALYSIS OF VARIANCE FOR MEASUREMENT OF SUMMARY  
ROLE IMPAIRMENT OF HEALTH CARE WORKERS

Source	Sum of Squares	d.f.	Variance Estimate	F Ratio	p
Between types of role resolution	9.7899	2	4.8950	1.0263	0.3621*
Within types of role resolution	467.4180	98	4.7696		
Total	477.2079	100			

\*Not significant

TABLE 12

ANALYSIS OF VARIANCE FOR MEASUREMENT OF TOTAL  
PSYCHOLOGICAL STATUS OF HEALTH CARE WORKERS

Source	Sum of Squares	d.f.	Variance Estimate	F Ratio	p
Between types of role resolution	15.9660	2	7.9850	3.9262	0.0229
Within types of role resolution	199.2617	98	2.0333		
Total	215.2277	100			



TABLE 13

MEAN SCORES OF THE PSS SUMMARY SCALES FOR HEALTH  
CARE WORKERS FROM THE DISASTER AREA

Summary Scale	Groups			Standard Score
	Role Conflict		No Conflict (3)	
	Family Role (1)	Community Role (2)		
Subjective Distress	32.39 (1)	34.25 (3)	33.35 (2)	35.74
Behavioral Disturbance	41.21 (1)	41.59 (3)	41.24 (2)	42.11
Impulse Control Disturbance	45.00 (=)	45.00 (=)	45.00 (=)	45.56
Reality Testing Disturbance	44.04 (2)	44.06 (3)	44.00 (1)	44.47
Summary Role Impairment	41.38 (2)	41.31 (1)	40.53 (3)	42.11
Total	31.13 (1)	32.03 (3)	31.52 (2)	Not Avail- able

Note: Numbers in parentheses indicate group rank for scale;  
1 = low.

TABLE 14

DUNCAN RANGE TEST ON "TOTAL" SCALE FOR HEALTH CARE  
WORKERS FROM THE DISASTER AREA

Initial Groups	Ranked Means	Mean Difference	Duncan's
Family Role-- Community Role	32.03125 - 31.13462	0.89663	0.88849*
Family Role-- No Conflict	32.03125 - 31.52940	0.50185	1.13842
No Conflict-- Family Role	31.52940 - 31.13452	0.39479	1.05974

\* Significant at the .01 level

TABLE 15

DUNCAN RANGE TEST ON "SUBJECTIVE DISTRESS" SCALE FOR  
HEALTH CARE WORKERS FROM THE DISASTER AREA

Initial Groups	Ranked Means	Mean Difference	Duncan's
Family Role-- Community Role	34.25000 - 32.38462	1.86538	1.60001*
Community Role-- No Conflict	34.25000 - 33.35294	0.89706	2.05007
Family Role-- No Conflict	31.35294 - 32.38462	0.96832	1.90840

\* Significant at the .01 level

TABLE 16

ANALYSIS OF VARIANCE FOR MEASUREMENT OF SUBJECTIVE  
DISTRESS OF HEALTH CARE WORKERS AND RED CROSS  
WORKERS

Source	Sum of Squares	d.f.	Variance Estimate	F Ratio	p
Between types of role resolution	50.7350	2	25.3675	4.5400	0.0123*
Within types of role resolution	759.9125	136	5.5876		
Total	810.6475	138			

\*  $p > .05$ .

TABLE 17

ANALYSIS OF VARIANCE FOR MEASUREMENT OF BEHAVIORAL  
DISTURBANCE OF HEALTH CARE WORKERS AND  
RED CROSS WORKERS

Source	Sum of Squares	d.f.	Variance Estimate	F Ratio	p
Between types of role resolution	0.5546	2	0.2773	0.1850	0.8313*
Within types of role resolution	203.8771	136	1.4991		
Total	204.4317	138			

\* Not significant

TABLE 18

ANALYSIS OF VARIANCE FOR MEASUREMENT OF IMPULSE  
CONTROL DISTURBANCE OF HEALTH CARE  
WORKERS AND RED CROSS WORKERS

Source	Sum of Squares	d.f.	Variance Estimate	F Ratio	p
Between types of role resolution	13.9136	2	6.9568	1.0605	0.3491*
Within types of role resolution	892.1728	136	6.5601		
Total	906.0863	138			

\* Not significant

TABLE 19

ANALYSIS OF VARIANCE FOR MEASUREMENT OF REALITY  
TESTING DISTURBANCE OF HEALTH CARE  
WORKERS AND RED CROSS WORKERS

Source	Sum of Squares	d.f.	Variance Estimate	F Ratio	p
Between types of role resolution	0.0060	2	0.0030	0.345	0.966*
Within types of role resolution	11.7351	136	0.8630		
Total	11.7410	138			

\* Not significant

TABLE 20

ANALYSIS OF VARIANCE FOR MEASUREMENT OF SUMMARY  
ROLE IMPAIRMENT OF HEALTH CARE WORKERS AND  
RED CROSS WORKERS

Source	Sum of Squares	d.f.	Variance Estimate	F Ratio	p
Between types of role resolution	2.0186	2	1.0093	0.2330	0.7925*
Within types of role resolution	589.1757	136	4.3322		
Total	591.1942	138			

\* Not significant

TABLE 21

ANALYSIS OF VARIANCE FOR MEASUREMENT OF TOTAL  
PSYCHOLOGICAL STATUS OF HEALTH CARE  
WORKERS AND RED CROSS WORKERS

Source	Sum of Squares	d.f.	Variance Estimate	F Ratio	p
Between types of role resolution	9.9325	2	4.9662	2.9028	0.0583*
Within types of role resolution	232.6719	136	1.7108		
Total	242.6043	138			

\*  $p < .05$ .

To determine which groups were significantly different, the Duncan multiple-range test was used with the following results: At the .01 level of significance, health care workers from the disaster area who chose the family role scored significantly lower on the subjective distress scale than health care workers from the disaster area who chose the community role (see Table 22).

TABLE 22

DUNCAN RANGE TEST AT .01 LEVEL ON SUBJECTIVE  
DISTRESS SCALE FOR HEALTH CARE WORKERS  
AND RED CROSS WORKERS

Initial Groups	Ranked Means	Mean Difference	Duncan's
Family Role-- Community Role	33.89130 - 32.50909	1.38221	1.28843*
Community Role-- Red Cross	33.89130 - 32.81578	1.07522	1.35645
Red Cross-- Family Role	32.81578 - 32.50909	0.30669	1.30527

\* Significant

At the .05 level of significance, Red Cross workers from outside the disaster area scored significantly lower on the subjective

distress scale than health care workers from the disaster area who chose the community role (see Table 23).

TABLE 23

DUNCAN RANGE TEST AT .05 LEVEL ON SUBJECTIVE  
DISTRESS SCALE FOR HEALTH CARE WORKERS  
AND RED CROSS WORKERS

Initial Groups	Ranked Means	Mean Difference	Duncan's
Family Role-- Community Role	33.98130 - 32.50929	1.38221	0.98419*
Community Role-- Red Cross	33.89130 - 32.81578	1.07552	1.02594*
Red Cross-- Family Role	32.81578 - 33.50909	0.30669	0.98724

\* Significant

Although not statistically different, the means of each group differ on some scales (see Table 24).

Hypothesis Four: During time of disaster, there will be no difference in level of psychological stress in health care workers or Red Cross workers as a function of occupation.

TABLE 24

MEAN SCORES OF THE PSS SCALES FOR HEALTH CARE  
WORKERS AND RED CROSS WORKERS

Summary Scale	Groups			Standard Score
	From Disaster Area		Red Cross Workers (3)	
	Family Role (1)	Community Role (2)		
Subjective Distress	32.51	33.89	32.82	35.74
Behavioral Disturbance	41.27	41.41	41.29	42.11
Impulse Control Disturbance	45.00	45.00	45.00	45.56
Reality Testing Disturbance	44.04	44.04	44.05	44.47
Summary Role Impairment	41.31	41.11	41.03	42.11
Total	31.20	31.83	31.42	Not Available

Note: Numbers in parentheses indicate group rank for scale;  
1 = low.



The hypothesis is not rejected (see Tables 25-30). There was little difference in the subjects' mean scores by occupation (see Tables 31-35).

TABLE 25

ANALYSIS OF VARIANCE FOR MEASUREMENT OF SUBJECTIVE  
DISTRESS OF HEALTH CARE WORKERS BY OCCUPATION AND  
ROLE

Source	Sum of Squares	d.f.	Mean Squares	F Ratio	p
Between roles	39.1940	2	19.5970	3.4815	0.0338
Between occupations	3.2496	1	3.2496	0.5773	0.4487*
Role X occupation	6.7591	2	3.3795	0.6004	0.5501*
Residual	748.6460	133	5.6289		

\*Not significant

Hypothesis Five: During time of disaster, the various combinations of role and type of occupation will not result in differences in psychological stress in health care workers or Red Cross workers.

TABLE 26

ANALYSIS OF VARIANCE FOR MEASUREMENT OF BEHAVIORAL  
DISTURBANCE OF HEALTH CARE WORKERS BY  
OCCUPATION AND ROLE

Source	Sum of Squares	d.f.	Mean Squares	F Ratio	p
Between roles	0.3337	2	0.1668	0.1113	0.8948*
Between occupations	1.9983	1	1.9983	1.3326	0.2504*
Role X occupation	3.0657	2	1.5329	1.0222	0.3626*
Residual	199.4412	133	1.4996		

\* Not significant

TABLE 27

ANALYSIS OF VARIANCE FOR MEASUREMENT OF REALITY  
TESTING DISTURBANCE OF HEALTH CARE  
WORKERS BY OCCUPATION AND ROLE

Source	Sum of Squares	d.f.	Mean Squares	F Ratio	p
Between roles	0.0132	2	0.0066	0.0769	0.9260*
Between occupations	0.2727	1	0.2727	3.1664	0.0774*
Role X occupation	0.0132	2	0.0066	0.0769	0.9260*
Residual	11.4529	133	0.0861		

\* Not significant

TABLE 28

ANALYSIS OF VARIANCE FOR MEASUREMENT OF IMPULSE  
CONTROL DISTURBANCE OF HEALTH CARE  
WORKERS BY OCCUPATION AND ROLE

Source	Sum of Squares	d.f.	Mean Squares	F Ratio	p
Between roles	11.0634	2	5.5317	0.8463	0.4313*
Between occupations	10.8120	1	10.8120	1.6541	0.2006*
Role X occupation	15.6594	2	7.8297	1.1978	0.3051*
Residual	869.3782	133	6.5367		

\* Not significant

TABLE 29

ANALYSIS OF VARIANCE FOR MEASUREMENT OF SUMMARY  
ROLE IMPAIRMENT OF HEALTH CARE WORKERS  
BY OCCUPATION AND ROLE

Source	Sum of Squares	d.f.	Mean Squares	F Ratio	p
Between roles	2.1407	2	1.0703	0.2499	0.7792*
Between occupations	2.0531	1	2.0531	0.4794	0.4899*
Role X occupation	16.8275	2	8.4137	1.9658	0.1442*
Residual	569.5407	133	4.2823	4.2823	

\* Not significant

TABLE 30

ANALYSIS OF VARIANCE FOR MEASUREMENT OF TOTAL  
PSYCHOLOGICAL STATUS OF HEALTH CARE  
WORKERS BY OCCUPATION AND ROLE

Source	Sum of Squares	d.f.	Mean Squares	F Ratio	p
Between roles	6.6451	2	3.3225	1.9519	0.1460*
Between occupations	2.2648	1	2.2648	1.3305	0.2508*
Role X occupation	3.0893	2	1.5416	0.9074	0.4060*
Residual	226.3920	133	1.7022		

\* Not significant

TABLE 31

MEAN SCORES OF PSS SCALE, SUBJECTIVE DISTRESS, BY  
OCCUPATION AND ROLE

Occupation	From Disaster Area		Red Cross
	Family Role	Community Role	
R.N.s	32.1875	33.5882	32.9524
Other health care workers	32.9565	34.0690	32.6471

TABLE 32

MEAN SCORES OF PSS SCALE, BEHAVIORAL DISTURBANCE,  
BY OCCUPATION AND ROLE

Occupation	From Disaster Area		Red Cross
	Family Role	Community Role	
R.N.s	41.3125	41.2941	41.0000
Other health care workers	41.2174	41.4828	41.4348

TABLE 33

MEAN SCORES OF PSS SCALE, IMPULSE CONTROL  
DISTURBANCE, BY OCCUPATION AND ROLE

Occupation	From Disaster Area		Red Cross
	Family Role	Community Role	
R.N.s	45.0000	45.0000	45.0000
Other health care workers	45.0000	45.0000	45.0000

The fifth hypothesis is not rejected (see Tables  
25 through 30).

TABLE 34

MEAN SCORES OF PSS SCALE, REALITY TESTING, BY  
OCCUPATION AND ROLE

Occupation	From Disaster Area		Red Cross
	Family Role	Community Role	
R.N.s	44.0000	44.0000	44.0000
Other health care workers	44.0870	44.0690	44.1176

TABLE 35

MEAN SCORES OF PSS SCALE, SUMMARY ROLE  
IMPAIRMENT, BY OCCUPATION AND ROLE

Occupation	From Disaster Area		Red Cross
	Family Role	Community Role	
R.N.s	40.9688	41.5882	40.7143
Other health Care workers	41.7821	40.8276	41.4118

Comparison of Characteristics of Subject Groups

All of the various combinations of groups were compared  
as to age, education, continuous hours worked without rest, sex,

religion, family responsibility, and damage incurred. For ease in comparison, numbers are assigned to groups as follows:

Hypothesis Two: Group 1 - Health care workers with family-community role conflict, chose family role.

Group 2 - Health care workers with family-community role conflict, chose community role.

Group 3 - Health care workers without role conflict (live alone).

Hypothesis Three: Group 4 - Health care workers, chose family role.

Group 5 - Health care workers, chose community role.

Group 6 - Red Cross workers.

Hypotheses Four and Five: Group 7 - Health care workers, R.N.s, chose family role.

Group 8 - Health care workers, R.N.s, chose community role.

Group 9 - Red Cross workers, R.N.s.

Group 10 - Health care workers, others, chose family role.

Group 11 - Health care workers, others, chose community role.

Group 12 - Red Cross workers, others.

Groups 1, 2, and 3 (see Table 36) were similar in average age of subjects and number of years in school, although groups 1 and 2

TABLE 36

COMPARISON OF CHARACTERISTICS OF HEALTH CARE  
WORKERS IN THE EXPERIMENTAL AND CONTROL  
GROUPS

Characteristics	Experimental		Control
	Role Conflict		
	Family Role (1) N = 52	Community Role (2) N = 32	No Role Conflict (3) N = 17
Age			
Mean	39.13 years	36.59 years	36.94 years
Range	18-61	19-65	20-63
Education			
Mean	14.69 years	15.41 years	14.65 years
Range	9-22	9-23	12-20
Continuous Hours Worked			
Mean	9.79 hours	15.59 hours	14.25 hours
Range	0-36	4-36	0-49
Sex			
Men	7 (13.5 %)	9 (28.19 %)	2 (11.8 %)
Women	45 (86.5 %)	23 (71.90 %)	15 (88.2 %)
Religion			
Declined	1 ( 1.9 %)	--	--
Protestant	32 (61.5 %)	18 (56.3 %)	12 (70.6 %)
Catholic	17 (32.8 %)	9 (28.1 %)	3 (17.6 %)
Jewish	--	--	--
Other	--	4 ( 3.1 %)	2 (11.8 %)
None	2 ( 3.8 %)	1 ( 3.1 %)	--



TABLE 36 (cont'd)

Characteristics	Experimental		Control
	Role Conflict		
	Family Role (1) N = 52	Community Role (2) N = 32	No Role Conflict (3) N = 17
Family Responsibility			
Yes	52 (100%)	32 (100%)	--
No	--	--	17 (100%)
Damage Incurred			
Yes	13 ( 25%)	18 ( 56%)	8 ( 47%)
No	39 ( 75%)	14 ( 44%)	9 ( 53%)

had subjects who did not finish high school. The average number of continuous hours worked without rest was about the same for groups 2 and 3, 15.59 hours and 14.25 hours respectively; but the average number of continuous hours worked for group 1 was 9.79. The maximum number of continuous hours worked by anyone in group 1 and group 2 was 36, and the maximum number of continuous hours worked in group 3 was 49. Group 1 had 13.5 per cent men, group 2 had 28.1 per cent men, and group 3 had 11.8 per cent men. Choice of religion was distributed comparably in each group. Twenty-five

per cent of group 1 had tornado damage, 56 per cent of group 2 had tornado damage, and 47 per cent of group 3 had tornado damage. The major differences in the groups was by design; subjects in groups 1 and 2 had family responsibility and subjects in group 3 lived alone.

The average age of subjects in groups 4, 5, and 6 varied from two to four years (see Table 37). The average number of years

TABLE 37

COMPARISON OF CHARACTERISTICS OF HEALTH CARE  
WORKERS AND RED CROSS WORKERS IN THE  
EXPERIMENTAL AND CONTROL GROUPS

Characteristics	Experimental		Control
	From Disaster Area		Red Cross
	Family Role (4) N = 55	Community Role (5) N = 46	(6) N = 38
Age			
Mean	39.64 years	35.96 years	37.29 years
Range	18-63	19-65	21-62
Education			
Mean	9.47 years	16.17 years	13.89 years
Range	0-36	8-49	5-48
Continuous Hours Worked			
Mean	14.69 hours	15.17 hours	15.24 hours
Range	9-22	9-23	12-20

TABLE 37 (cont'd)

Characteristics	Experimental		Control
	From Disaster Area		
	Family Role (4) N = 55	Community Role (5) N = 46	Red Cross (6) N = 38
Sex			
Men	7 (12.7%)	11 (23.9%)	8 (21.1%)
Women	48 (87.3%)	35 (76.1%)	30 (78.9%)
Religion			
Declined	1 ( 1.8%)	--	1 ( 2.6%)
Protestant	33 (60 %)	29 (63.0%)	24 (43.2%)
Catholic	19 (34.5%)	10 (21.8%)	10 (26.3%)
Jewish	--	--	--
Other	--	6 (13.0%)	2 ( 5.3%)
None	2 ( 3.6%)	1 ( 2.2%)	1 ( 2.6%)
Family Responsibility			
Yes	52 (94.5%)	32 (69.6%)	31 (81.6%)
No	3 ( 5.5%)	14 (30.4%)	7 (18.4%)
Damage Incurred			
Yes	15 (27.3%)	24 (52.2%)	1 ( 2.6%)
No	40 (77.7%)	22 (47.8%)	37 (97.4%)

in school for each group varied from 9.47 to 16.7 years. Group 1 had subjects who did not finish high school. The average number of continuous hours worked by subjects in group 5 was 15.17, the average in group 6 was 15.24 and the average in group 4 was only 14.69.

Group 4 had 12.7 per cent men, group 5 had 23.9 per cent men, and group 6 had 21.9 per cent men. Although there were differences in religion, the majority of subjects in each group were Protestant with the next largest group being Catholic. Twenty-seven per cent of group 4 had tornado damage, 52 per cent of group 5 had tornado damage, and 2 per cent of group 6 had tornado damage. In all groups, the majority of subjects had family responsibility

The average age in groups 7, 8, 10, and 11 varied from two to four years (see Table 38). The average age in group 9 was 31.57 and in group 12 it was 44.35, as compared with an average of 35.59 to 39.69 in the other groups. The average number of years in school in each group approached fifteen years, although there was quite a difference in range according to group. None of the R.N. groups (7, 8 and 9) had men subjects. There were 30 per cent men in group 10, 37 per cent men in group 11, and 47 per cent men in group 12. The majority in each group were Protestant with the next largest group being Catholic. Twenty-five per cent of group 7 had tornado damage, 37 per cent in group 8 had tornado damage, 30 per cent in group 10 had tornado damage, and 59 per cent in group 11 had tornado damage. As designed, there was little or no damage reported by the control groups, 9 and 12. One subject in group 12 reported damage

TABLE 38

COMPARISON OF CHARACTERISTICS OF HEALTH CARE WORKERS  
AND RED CROSS WORKERS IN THE EXPERIMENTAL AND  
CONTROL GROUPS BY OCCUPATION AND ROLE

Characteristics	Family Role		
	(7) R.N.s N = 32	(10) Others N = 23	(8) R.N.s N = 16
Age			
Mean	39.69 years	39.56 years	37.50 years
Range	22-61	18-63	20-60
Education			
Mean	15 years	14.26 years	15 years
Range	14-16	9-22	14-18
Continuous Hours Worked			
Mean	11.25 hours	7 hours	16.5 hours
Range	0-36	0-24	8-49
Sex			
Men	--	7 (30%)	--
Women	32 (100%)	16 (70%)	16 (100%)
Religion			
Declined	1 ( 3%)	--	--
Protestant	15 ( 47%)	18 (79%)	13 ( 81%)
Catholic	15 ( 47%)	4 (17%)	3 ( 19%)
Jewish	--	--	--
Other	--	--	--
None	1 ( 3%)	1 ( 4%)	--

		Control	
Community Role		Red Cross	
	(11) Others N = 27	(9) R.N.s N = 21	(12) Others N = 17
	35.59 years 19-65	31.57 years 21-59	44.35 years 26-62
	15.37 years 9-23	15.14 years 14-16	15.35 years 12-20
	15.47 hours 0-48	8.52 hours 5-20	13.70 hours 8-48
	10 (37 %) 17 (63 %)	-- 21 (100 %)	8 (47 %) 9 (53 %)
	-- 14 (52 %) 7 (26 %)	-- 16 (76 %) 4 (19 %)	1 ( 1 %) 8 (47 %) 5 (34 %)
	-- 5 (18 %) 1 ( 4 %)	-- -- 1 ( 5 %)	-- 2 (12 %) 1 ( 6 %)

TABLE 38 (cont'd)

Characteristics	Experimental		
	Family Role		C
	(7) R.N.s N = 32	(10) Others N = 23	(8) R.N.s N = 16
Family Responsibility			
Yes	30 (94 %)	22 (96 %)	10 (63 %)
No	2 ( 6 %)	1 ( 4 %)	6 (37 %)
Damage Incurred			
Yes	8 (25 %)	7 (30 %)	6 (37 %)
No	24 (75 %)	16 (70 %)	10 (63 %)

		Control	
Community Role		Red Cross	
	(11) Others N = 27	(9) R.N.s N = 21	(12) Others N = 17
	19 (70%) 8 (30%)	20 (95%) 1 ( 5%)	11 (65%) 6 (35%)
	16 (60%) 10 (40%)	-- 21 (100%)	1 ( 6%) 16 (94%)



to some investment property he owned in the disaster-struck community. The majority of subjects in all of the groups had family responsibility.

### Summary

In this chapter the researcher has presented an analysis of data in respect to the hypotheses examined. The first section included a frequency count of number of subjects who chose the family role and those who chose the community role in relation to family responsibility. The mean scores on all of the scales of the PSS were reported for various groupings of the subjects. The first hypothesis was tested with a chi-square analysis. Analyses of variance, one-way and two-way, were used to test the rest of the hypotheses. Duncan's multiple-range test was used to determine which groups were significantly different. The following results were obtained.

During the time of the disaster:

1. Family responsibility and family-community role choice were significantly related for health care workers.
2. Family responsibility and family-community role choice were significantly related for registered nurses.
3. Family responsibility and family-community role choice were significantly related for health care workers other than registered nurses.

4. Family responsibility and family-community roles choice were significantly related for female health care workers.

5. Family responsibility and family-community role choice were not significantly related for men health care workers.

6. There was a significant difference in level of psychological stress among health care workers with role conflict who chose either the family or community role first and health care workers with no role conflict.

7. There was a significant difference in level of psychological stress among Red Cross workers from outside the disaster area and health care workers who chose either the family or community role first.

8. There was no significant difference in level of stress in health care workers and Red Cross workers as a function of occupation.

9. There was no significant difference in level of stress in health care workers and Red Cross workers as a result of the various combinations of family-community role conflict and type of occupation.

In the second section of this chapter, the subjects in the experimental and the control groups were compared by various categories regarding age, education, number of continuous hours worked without rest, religion, sex, family responsibility, and damage incurred.

Except for variance in characteristics around which subjects were grouped, the major differences were in the proportion of men to women and the range of years of subject's education. Thus, all of the groups were not evenly matched for each characteristic.

## CHAPTER V

### DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

#### Discussion of Data

A lot of data was collected and analyzed in this study and some conclusions can be drawn, but as in most previous disaster field studies, interpretations must be made cautiously.

Hypothesis One: During time of disaster, health care workers will choose proportionally the same between their family and community roles.

The hypothesis was rejected for all subjects except men health care workers. This finding supports the assumptions of Hill and Hansen<sup>55</sup> that if the worker has any doubt concerning his family's welfare, he will choose his family role and neglect his community role.

This finding is in accord with observations made by Fogelman and Parenton<sup>56</sup> that disaster victims' behavior is primarily family

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<sup>55</sup>Hill and Hansen, p. 211.

<sup>56</sup>Fogelman and Parenton, p. 130.

oriented. Studies by Lynch,<sup>57</sup> Moore and Friedsam,<sup>58</sup> and Drabek,<sup>59</sup> in which the importance of family relationships were identified, were clearly supported also.

Considering the American culture today, one might expect that the majority of female health care workers would choose the family role over the community role, whereas the male health care worker would choose the community role. Men probably feel great internal and external pressure to assume their community role and women probably feel the pressure to stay with their family at home because of the usual division of labor in households today.

With the trend toward women's rights and responsibilities, one's sexual identity should have less influence on role choice in the future.

Hypothesis Two: During time of disaster, there will be no difference in level of psychological stress among health care workers with role conflict who choose either the family or community role first and health care workers with no role conflict.

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<sup>57</sup>Lynch, p. 100.

<sup>58</sup>Moore and Friedsam, pp. 135-139.

<sup>59</sup>Drabek, p. 447.

The hypothesis was rejected on the basis of the "subjective distress" and "total" scores. As the summary subjective distress scale includes the following symptom scales --depression, anxiety and somatic concern—it is not surprising to find this scale elevated. Tyhurst,<sup>60</sup> Howard,<sup>61</sup> McHugh,<sup>62</sup> and Whalen<sup>63</sup> all identified depression, anxiety, and somatic concern as psychological reactions that occur in disaster.

It was not unexpected that health care workers who chose the community role would manifest the most psychological stress, but it was unexpected that the health care workers who chose the family role would manifest the least psychological stress, with control groups ranked in between. This finding suggests that all workers would have a lower level of psychological stress if they could first ascertain the well-being of their families and the condition of their personal and real property.

In interpreting the results of this data analysis, one must also consider the possible impact of extraneous variables as family

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<sup>60</sup>Tyhurst, p. 768.

<sup>61</sup>Howard, p. 2.

<sup>62</sup>McHugh, p. 1.

<sup>63</sup>Whalen, p. 2.

constellation and continuous hours worked without rest. The control group was made up of health care workers who lived alone as compared with the experimental groups who lived in some type of family relationship.

In reviewing the continuous hours worked without rest, there appears to be a relationship with the level of psychological stress. The experimental group that chose the family role had a variance of none to thirty-six continuous hours worked with an average of 9.79 hours, the control group had a variance of none to forty-nine hours with an average of 14.25 hours, and the experimental group that chose the community role first had a variance of four to thirty-six hours and an average of 15.59 straight hours of work.

Hypothesis Three: During time of disaster, there will be no difference in level of psychological stress among Red Cross workers from outside the disaster area and health care workers from the disaster area who chose either the family or community role first.

This hypothesis was rejected on the basis of the "subjective distress" summary scale. As previously discussed, one would expect to find some elevation in this scale because of the component scales: depression, anxiety, and somatic concern.

As with the groups tested in the second hypothesis, the health care workers who chose the family role first had the lowest level of psychological stress, the Red Cross workers were next, and the health care workers who chose the community role first had the highest level of stress.

These results were somewhat surprising, since the researcher expected that the group from outside the disaster area, the Red Cross workers, would have the lowest level of psychological stress. The experimental and control groups were fairly homogeneous, except in number of hours worked. However, one of the experimental groups matched the control group with maximum hours of forty-nine and forty-eight respectively; and in the other experimental group subjects who chose the family role had a maximum of thirty-six hours worked without rest.

Unable to justify the unexpected level of psychological stress in the Red Cross worker group through variance in characteristics, one must look further. Although most of the Red Cross workers were on duty because they volunteered or consented when recruited, this did mean a sudden, unexpected change in their ongoing plans. Individuals came from various places, leaving their families and obligations to take on the responsibilities associated with their position



in disaster duty. This may account for the higher Red Cross PSS scores, for even though the health care workers were from the disaster-struck community, they were not separated from their families.

In the case of Red Cross staff already stationed in the Chapter serving as the disaster headquarters, they experienced the added strain of being enmeshed in consultants, volunteers, supplies (such as a truckload full of bananas) and responsibility.

Hypothesis Four: During time of disaster, there will be no difference in level of psychological stress in health care workers or Red Cross workers as a function of occupation.

The hypothesis was not rejected. This finding indicates that all health care workers and Red Cross workers experienced similar levels of psychological stress during time of disaster. Perhaps this is because the workers react first through their humanness and thus they would be likely to react similarly.

All of the groups had lower mean scores than the standardized scores and, thus, sub-clinical scores. This means that the subjects, as an average, were mentally healthy.

Hypothesis Five: During time of disaster, the various combinations of role and type of occupation will not result in differences in psychological stress in health care workers or Red Cross workers.

The hypothesis was not rejected. This hypothesis was formulated to determine whether the interaction of role and occupation had any significant effect on the worker's level of psychological stress. However, when the analysis yielded no significant effect by occupation, it followed that the interaction of the variables would not be significant.

As discussed in Chapter III, it is fairly well documented that psychological reaction to disaster occurs in sequential phases, without well defined beginnings and endings, that these phases may differ in length according to the individual. Therefore, individuals may have been in different phases of the reaction process when interviewed, even though the data collecting was completed in a short eleven-day period. The research would have been strengthened if, in some way, all subjects could have been interviewed at the same point in the reaction process.

The researcher was aware of distinct changes in the emotional climate of the disaster-struck community. Shock and disbelief was prevalent when the researcher arrived twenty-four hours post disaster, and this continued for a period approaching seven days. There was a profound quiet in the shelters, hospitals, and throughout the disaster-struck community.

As the shock began to dissipate, there were open expressions of emotions, generally sadness with crying, and thankfulness for life of self, family, and friends. In the last few days of the study, physical tiredness was evident, people became impatient, and anger was expressed in various ways.

Rescue agencies took their share as scapegoat, as described by Whalen<sup>64</sup> and Drabek and Quarantelli,<sup>65</sup> although the most obvious target of anger was insurance companies. As illustration, when workers were asked what had affected them the most, in the first week the responses generally dealt with the destruction. In the last interviews, the respondents often angrily lashed out at the inconveniences "caused" by insurance agencies.

The researcher was well received wherever she went. Individuals openly responded in the interview and were most generous with their time. Only two individuals refused to be interviewed. One subject, two hours after the interview, requested that he be deleted from the study and took back his response sheet.

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<sup>64</sup>Whalen, p. 4.

<sup>65</sup>Thomas E. Drabek and Enrico Quarantelli, "Scapegoats, Villains, and Disasters," Trans-action, 4 (March 1967): 12-17.

Although the majority of health care workers checked first on their family before reporting for work in the community, it must be noted that generally there was only a short time spent with their family. Those who did stay to comfort their children or just to be with their family for a while admitted to guilt. Workers expressed guilt because their homes or families were safe, with destruction all around them.

There was a spirit of community altruism with a high value on disaster relief work of any kind. People came from far and near, saying they had to do "something." Nurses reported for duty who had not worked for years. Hospitals were generously staffed, and could have well afforded for the worker with family responsibilities to stay at home for a while. In fact, personnel were encouraged to see about their family. When subjects recounted this to the interviewer, they appeared grateful for the hospital management's concern, but nevertheless felt a strong need to stay on duty.

It was surprising to the researcher that the sample population's mean scores on the PSS scales were lower than the standardized scores. Can scores standardized to a New York City population not be generalized to a small mid-western community? Or, can the lower scores of the subjects be attributed to a mass use of denial?

Without pre-disaster scores, there is no way to know for sure. However, there is still validity in using the scores to compare groups within the study population. Certainly, the PSS can be used with the same subjects for measuring change in future study.

### Conclusions

The following conclusions were made on the basis of the findings in this study:

1. During time of disaster, a significantly greater number of women health care workers with family-community role conflict chose the family role over the community role.
2. During time of disaster, there was no significant difference in family or community role choice by men health care workers.
3. During time of disaster, health care workers who resolved their family-community role conflict by choosing the family role had significantly less psychological stress, as evaluated with the "total" and "subjective distress" scales on the PSS, than did health care workers who resolved their family-community role conflict by choosing the community role.
4. During time of disaster, health care workers from the disaster area who chose the family role had significantly less

manifestation of psychological stress, as evaluated with the "subjective distress" scale on the PSS, than did health care workers from the disaster area who chose the community role.

5. During the time of disaster, Red Cross workers from outside the area had significantly less manifestation of psychological stress, as evaluated with the "subjective distress" scale on the PSS, than did health care workers from the disaster area who chose the community role.

6. During time of disaster, registered nurses did not differ significantly in level of psychological stress from other health care workers.

7. During time of disaster, health care workers from the disaster-struck community functioned with good mental health, as evaluated on the PSS.

8. During time of disaster, Red Cross workers functioned with good mental health, as evaluated on the PSS.

#### Recommendations

In view of the results and conclusions, the following recommendations are offered:

1. This study might be replicated in a different geographical area to determine if the findings in this study are representative of other groups.

2. This study might be used as the groundwork for a longitudinal study of psychological reactions to disaster.

3. Health care workers might be encouraged to first ascertain their own families' welfare before assuming their disaster role in the community.

4. Red Cross workers might be utilized in time of disaster to free up the health care workers from community responsibilities.

5. Continued attention should be given to the methodological challenge of disaster research.

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