University of Delaware
Disaster Research Center

REPORT SERIES
#14

ORGANIZATIONAL INNOVATION
IN ANTICIPATION OF CRISIS

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1974

FOREWORD

This document is one of a series of publications prepared by the staff
of the Disaster Research Center, The Ohio State University on sociological
aspects of civil disturbances. The bulk of the Center's research deals
with consensus types of community emergencies such as those generated by
natural disasters. However, for purposes of analytical contrast, the
Center has done research on dissensus types of community emergencies such
as those generated by civil disturbances. The work reported here is part
of that effort. The research for this report was done in part under
Grant 5 RO1 MH-15399-01 to 05 from the Center for Applied Social Problems
in the National Institutes of Mental Health.

ACKNOWLEDGEMENTS

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CHAPTER I

INTRODUCTION

Community crises are major emergency situations for which routine
social structures are inadequate. Crises make preservation of valued
items and behavior patterns so precarious that extraordinary social
arrangements are deemed necessary to cope with them. Some crises over-
take a community gradually, so that with foresight social structures can
be gradually modified to ameliorate their effects. Pollution and other
forms of environmental decay present this possibility for gradual, if
far-reaching adjustments. Natural disasters [1] and civil disturbances [2]
are different. They are crises which overtake a community with little
forewarning. Their suddenness and intensity demand extraordinary social
adjustments to shield communities from their consequences. They require
immediate response to their unscheduled appearances.

Certain organizations by virtue of their relevance to the intense
demands of natural disasters and civil disturbances are required to
respond to them. This study deals with organizations which clearly are
responsible to meet the problems of these crises. Organizations such as
police departments, fire departments, civil defense agencies, hospitals,
local Red Cross chapters and the Salvation Army, are clearly responsible
to act in one or both of these crisis situations. Yet, sudden crises may
seem remote. They are common enough in general terms, but rare and
unexpected in terms of any particular community. The timing of such
crises is unpredictable. Even organizations with clear commitments to
meet the critical problems of natural disasters and civil disturbances
cannot remain forever poised for a remotely possible, unscheduled event.
Each of these organizations has other, pressing, daily concerns that
compete for their energies and efforts.

Thus, innovations made by organizations in anticipation of possible
crisis responses are in most cases marginal to their highest priority
concerns. The specialized problems of response to crises are typically
outside the range of problems encountered in their routine organizational
actions. In this sense, this is a study of innovations marginal to
routine organizational domains. [3] It explores in what ways, and under
what conditions organizations address secondary problems which one day
may suddenly become their primary immediate concerns.

The Research Tradition

This study carries forward a research interest of the Disaster
Research Center (DRC) at The Ohio State University. Beginning in 1963
DRC has carried out studies of organizational responses to major community
disasters. Since 1965, civil disturbances have also been studied.
Although DRC research focuses primarily upon immediate responses to

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crises, considerable interest has been sustained in the consequences of crises for organizations which must respond to them. This interest has led to three major studies, Anderson's (1969) study of organizational changes following the 1964 Alaskan earthquake; Adams, Stallings and Vargo's (1970) collection and summary of similar data for three other cities which have experienced major disasters; and Warheit's comparative research on interorganizational changes induced by natural disasters and civil disturbances.

In 1964, a massive earthquake struck several portions of Alaska, including Anchorage, its largest city. DRC undertook an extensive study of organizational responses to the immediate demands of the disaster. William Anderson was heavily involved in collection of data for this study, and he subsequently undertook a study of long-term organizational changes which grew out of the disaster. He explores the enduring organizational consequences of response to the demands and problems of a major community crisis, taking up anew some of the problems first explored by Prince (1920). In his research he examines twenty-three organizations located in Anchorage which were involved heavily in responses to the earthquake.

Anderson's purpose is to uncover social conditions produced by the disaster which subsequently led to changes in organizations. Thus, he viewed organizational change as a consequence of social conditions brought about by the disaster and not as a direct consequence of the disaster itself. He searches equally for conditions which lead to new patterns of change and those which accelerated existing patterns. He finds several social consequences of disaster which appear to be related to both new and accelerated patterns of change. These conditions are found both within the organizations and in their environments.

Anderson identifies two internal conditions which help to account for long-term organizational change following disaster, organizational strain and organizational learning. Organizational strain refers to conditions where some segment of an organization operates at cross purposes or in a manner contradictory to overall action or expectations. It may also refer to an overall discrepancy between organizational performance and expectations. Anderson concludes that the disaster experience accentuated strain which pre-dated the disaster and in one case showed that strain developed when organizational capabilities to respond to disaster were far below minimum expectations. Because the present study limits its focus to changes designed to improve possible responses, it must be noted that most of the changes associated with organizational strain were not innovations designed to such ends. Rather, they tend toward removal of personnel and reorganization of organizations where the disaster is best seen as a catalyst accounting for change made for other purposes.

The other internal condition, organizational learning, was associated primarily with changes in organizational resources. Anderson accounts for the role of organizational learning with the following:

> As problem solving entities, organizations incorporate into their structures and processes the knowledge and skills gained from encounters with various kinds of events and situations. Accordingly, unique events such as disasters offer organizations an opportunity to discover alternative modes of operating (1969: 77).

Typically, the lessons learned were that certain communications and resource items could be useful supplements and replacements for routine technological systems damaged by disaster impacts. One exception of this pattern was the reorganization of a state agency with primary responsibilities for coordination during disaster responses. This organization learned the relative importance of a certain sector of their operations required upgrading of that subunit within the organization.

Two often related social conditions in organizations' environments also positively influence organizational change. These are new demands upon the organization from their environments and increased support from their environments. All of the cases of change related primarily to new environmental demands fall outside the scope of the present study. The changes associated with increased demands arose from recovery efforts from impact damage rather than the problems experienced during responses. In some cases organizational changes can be traced to a general recognition of the importance of some organizations involved in a response. The prime examples were two civil defense organizations which received higher levels of financial support and greater cooperation after the disaster demonstrated their potential importance to the community. Anderson also looks for evidence that interorganizational conflicts growing out of the disaster might also be related to organizational changes. However, the data he examined did not include any such cases.

A most interesting finding of Anderson's study, however, is the very low level of change produced by the disaster experience.

> When the magnitude of the earthquake is taken into account, it is somewhat surprising to note the limited extent of actual long-term changes initiated by it. While some organizations did experience significant change, a large number underwent few or only minor . . . adjustments. (Anderson, 1969: 81).

As DRC's co-directors express it, "In the main, what is impressive is the relative lack of organizational change. . . ." (Dynes and Quarantelli, 1969). The disaster had been extreme in its physical impact, and it was no less extreme in demonstrating the inability of many organizations to effectively respond to its demands. There are indications in Anderson's

study that this fact did not go unperceived by people in the organizations studied. Yet, preparation for subsequent possible crises was minimal. [4]

Viewed as a whole, these are equivocal findings. Social consequences of natural disaster, particularly those of organizational learning, new environmental demands, and increased environmental support, can lead organizations to innovate in anticipation of other possible crises responses. However, at best, most organizations made only minor changes. Further, it is a reasonable assumption from examination of DRC data on responses of organizations to the earthquake that the changes made were not any more needed than many which were not. The fact that in 1967 disaster plans for the state were not yet completed provides a twist to the data which calls for further exploration. It is clearly significant that organizations do take measures to improve preparedness for crisis after experience of response, but it is also significant that so few organizations did so. More information is required to search for other factors which might account for these few cases of significant change. What conditions distinguished these organizations from the many which changed little or not at all? Was the pattern of little over-all change a typical one or one not found in other cities following a major disaster?

To provide an opportunity to explore these questions, DRC collected information on organizational changes in three additional cities which had experienced major disasters. The disasters included an explosion, a hurricane followed by severe flooding, and a particularly destructive tornado. These data have not been extensively analyzed, but have been reduced to descriptions (Adams, et. al., 1970) of each organization's response and its subsequent changes in the three to six years which had passed since the disasters. The descriptive account makes at least one point clear. Anderson's study did not find an atypical pattern. While, again, there were some major changes in each of the additional cities, the predominant pattern was one of little organizational change in anticipation of subsequent responses. In an analysis appended to the main descriptive body of this report Adams indicates the probability that organizations which take on new tasks in response to disaster are more likely to change than those performing tasks very similar to those performed routinely. However, his comments are brief, and the need for further analysis of these data remains.

Warheit (1968) has also explored the consequences of crisis response for organizations. He compares impacts of natural-disaster and civil-disturbance responses on interorganizational relationships. The exploratory study details the interorganizational effects of crisis response in four cities. Two had experienced major natural disasters, and the remaining cities had experienced two of the most severe of the civil disturbances which occurred in the United States during the last half of the 1960's. Warheit studies both short-term interorganizational adjustments during the responses and long-term interorganizational adjustments which followed. The findings are clearest for short-term adjustments.[5] All of the organizations experienced short-term interorganizational

adaptations, and several patterns which may explain differences among these adaptations were noted. Findings for long-term changes were less clear. However, here we are interested only in such permanent alterations of organizations.

Warheit explores not only the differential effects of the two types of crisis upon interorganizational change, but also the influence of different organizational structures. The study examines three types of organizations. Police and fire departments are classified as "bureaucratic" organizations with "protective" functions for their communities. Telephone, electric and gas companies are designated "technical" organizations with "utilities" functions. Red Cross and Salvation Army are identified as "volunteer" organizations with "welfare" functions. These distinctions are quite useful in understanding differences in short-term interorganizational changes during responses. However, they do not seem to be important for patterns of long-term change.

The study does indicate that long-term changes were more common following response to civil disturbances than natural disasters. There were some changes in natural-disaster cities, but few of them. Warheit suggests these differences occurred because these civil disturbances were new experiences for the cities where they occurred. Because both were relatively unprepared for responses to civil disturbances, more new problems were revealed by responses to them. In Anderson's terms, there was more opportunity for organizational learning.

Warheit points out two interesting aspects of changes following civil disturbance responses. First, many of these changes were formalized as legal statutes and ordinances. None of the changes following natural disasters were legal changes and most were not even formalized as written agreements. Second, these legal measures were often enacted to regulate cooperation and mutual assistance between law enforcement agencies of different jurisdictions. Civil disturbances had required the combined efforts of local police forces, National Guard troops, and in one case, U.S. Army troops. Considerable problems in coordination and designation of over-all authority resulted and interorganizational conflicts occurred. While Anderson found no indication that interorganizational conflicts during disaster response lead to change, Warheit's major cases of change are traced to this factor. The pattern of difficulty in coordination among law enforcement organizations does not extend to fire organizations. Fire departments which also relied heavily on outside assistance during response to the civil disturbances did not experience similar interorganizational conflicts nor were legal changes made to regulate their interorganizational relationships with other organizations performing the same tasks. For the fire departments and the utilities organizations most changes following civil disturbances placed restrictions upon their operations in subsequent civil disturbances. Their responsibilities were circumscribed to occasions where police deemed it safe for them to operate. This change was part of the overall pattern of centralizing authority for responses in police departments.

Warheit suggests that these changes and the cases of change found among organizations experiencing natural disasters all had one prior condition in common. He stresses that when long-term changes did occur, they were always precipitated by some serious problem which arose during the response (1968: 107). For example, an extensive change in inter-organizational relationships found following one of the natural disasters was of this nature. A police department unexpectedly carried a heavy burden of community coordination during the response. Subsequently, this department was very active in promoting a new interorganizational plan regulating the kinds of relationships with other local organizations which they found burdensome. Experience of new, serious problems is the only positive factor for interorganizational change Warheit isolates from the data he examines. This condition is comparable to Anderson's identification of the role of organizational learning and that of encountering new tasks suggested by Adams. For long-term changes the influence of organizational characteristics and of differences in crisis agents is indirect. They are important only as they affect the types of demands experienced during response. The more difficult, unexpected and new these demands are, the more likely it is that an organization will change to anticipate other crisis responses.

Finally, Warheit's finding of more change following civil distur-bances than natural disasters compares in an interesting way to a serendipitous pattern that is found in the data described by Adams, Stallings and Vargo. Although, low levels of change were found in the organizations which experienced disaster responses in three cities, many changes were found in preparation for civil disturbances. None of these communities had experienced major civil disturbance problems, yet they were preparing for them to a greater extent than the natural disaster problems they had experienced. The puzzle of the conditions under which organizations prepare for crisis response grows more complex. Actual experience of the difficulties of natural-disaster responses appears to be less conducive to organizational changes than factors associated with civil disturbances _even without direct experience._

Inception of the Study

Two things make the need for the present study clear and promote interest in it. First, there are several problems brought into focus by the research of Anderson and Warheit. Second, continued field experience revealed cases of greater organizational change for disaster response, and showed again and again a pattern of greater levels of change in anticipation of civil disturbances than natural disasters.

The studies by Anderson and Warheit indicate a number of conditions which can lead to change, but none of these seem sufficient by themselves. Given the low proportion of organizations which do change and a famil-iarity with the disaster responses experienced by all of the organizations, it is difficult to conclude that those changing were the only ones subject

to the explanatory factors suggested. It is much more likely that almost all of the responding organizations experienced organizational learning and encountered excessive, unexpected demands. Thus, these conditions are not sufficient to explain subsequent organizational changes because they were not confined to organizations that changed. These conditions are the legacy disaster response provides for almost all organizations, but only a few ultimately undergo significant change. There must be additional, as yet unidentified, conditions for change in anticipation of future disaster responses. These additional conditions seem to be relatively more important ones in that they are the factors which bring organizations to act upon their experience and organizational learning.

A second, and perhaps more important problem, is brought into focus by these previous studies. This is variation in the <u>organizational nature</u> of those changes which did occur. Although this point is not emphasized or analyzed in the above studies, it is clear from the descriptions they provide that the changes found were not often major. That is, these changes did not greatly affect the organizations as social systems. This suggests the utility of examining the organizational nature of changes associated with crisis responses. All social changes are not equal; they differ widely in their significance for the social systems in which they occur. Analytical distinctions among different types of changes -- particularly between those which significantly alter organizations and those which do not -- is a prerequisite to satisfactory research on organizational changes. The search for explanations of organizational change cannot proceed far, if all sorts of quite different things are uncritically lumped together as organizational changes. It is reasonable to believe that different types of changes may be associated with different conditions.

At the same time, DRC field experiences continued to include other relevant cases. One relatively small community provided an example of a greater level of organizational changes. This community was vulnerable to flooding and had experienced major flood threats twice in approximately fifteen years. A brief field trip by two DRC staff members revealed that several organizationally significant changes had been directed toward improved response should another flood occur. Interestingly, these changes did not follow directly upon the experience of disaster. They followed the second flood by several years. Cautiously, because of our sparse data, a condition which contributed to these changes can be inferred. Momentum for change had been provided by one of the disaster relevant organizations in the community. This organization had influenced others to take the problem of disaster seriously and prepare for it. The local Red Cross chapter, under a new chairman, became concerned with the problem of disaster response and acted as a change agent relative to other local organizations.

Two other interesting situations involving organizational preparation for disaster response were also encountered. These occurred in the hospitals of two communities. One community is again relatively small, but the other is among the thirty largest cities in the United States.

In both of these cases it was not disaster response which precipitated change, but "near misses" which provoked interest in what could have happened had disaster occurred. In the smaller community, a tornado narrowly missed one of its three hospitals. An official at this hospital who had nominally been responsible for disaster preparedness for some time, became seriously concerned by the prospects of disaster response for the first time. He and his counterparts in the other hospitals then took the problem to the county organization which represents physicians. In cooperative fashion these principals worked out disaster plans for each of their organizations and for their mutual cooperation. Similarly, in the large city, a train derailment which caused no injuries mobilized interest in the problem of mass-casualty situations. Again, with the cooperation among organizations an episode of disaster planning and preparation ensued. In both of these cases and in the flood preparations of the previous example an important condition for change is apparent. This is shared, interorganizational interest and action to meet the problem of disaster preparedness. All three examples are also instructive in the absence of immediate prior experience of actual disaster problems as a condition for change.

As DRC pursued its research interests in organizations responsible to meet demands of civil disturbances, other information bearing on the problems was encountered. It became increasingly clear that organizations are much more likely to undergo change in anticipation of civil disturbances than natural disasters. The pattern suggested by Warheit's results quite clearly held in a number of other circumstances. The low levels of organizational change directed toward natural disaster responses found in previous studies presented an intriguing contrast to the numerous and often extensive changes DRC staff members encountered in organizations in the river-community and hospital examples above, these changes were, more often than not, taking place independently of the experience of crisis response. These observations buttress the supposition that primary factors for organizational changes in anticipation of crisis do not reside in experience. In some cases such changes were taking place where the possibility of civil disturbance seemed remote, even to the administrators who were making the changes.

One noteworthy, if extreme, example of this pattern was found in a city of about 50,000 situated on a major river. The community had a history of flooding, several times of serious consequence. At least minor flooding was a yearly experience. The expectation of some emphasis on preparations for response to floods, therefore, is not unwarranted. However, such preparations were not easily found. On the other hand, there was evidence of recent organizational changes in anticipation of civil disturbance response. The community's population was about 4 percent black. Most blacks were residents of long standing. No recent immigration had occurred. There was no history of racial strife. The minority population was quiescent. From the standpoint of the police department the major problem involving blacks was the practice of whites "from the town across the river" driving over to harass them. Despite

example, were intended to reduce tensions between them and minority communities which might engage in civil disturbances.

It is also necessary to limit our focus to organizational innovation, rather than the term organizational change. As a way of distinguishing innovation from the broader concept of change we can define organizational innovation as "a purposeful alteration of some controllable aspect of an organization by those having authority to do so." There are three attributes of innovation which seem to adequately separate it from the general notion of change. (1) Innovations exist as an idea prior to their institution; changes need not. (2) There is thus an implicit notion that innovations are decided upon; changes need not be. (3) These decisions are reached by those occupying positions with the authority to alter their organizations, thereby providing for easy location of people who have certain knowledge of the existence of innovations; changes may be known only to persons who escape the attention of the researcher, or none may be aware of them. Organizational changes can occur in other than purposeful ways. They can be subtle to the point of escaping the notice of an organization's members. The methodological requirements for establishing that an organization has changed are considerably more difficult than for determining an innovation has been made. Innovations, of course, are known to those who implement them and are accessible in a reliable and valid fashion to the researcher who gathers his data from knowledgeable informants. This reduction of difficulty in data collection and of reliability and validity problems makes possible the systematic consideration of far many more cases.

Our focus is also upon organizations, but here we use the term more broadly than is sometimes the case. Without modification the term "organization" usually implies both "formal" and "complex" as modifiers. When sociologists speak of organizations they usually mean not only enduring and formally instituted social structures, but also large and complex ones as well. In the present case, however, we shall examine many organizations which are not large and complex. This is because some of the organizations with responsibilities for crisis demands are small offices. These are still formal and enduring social structures and are amenable to research on innovations. Because these small organizations are so central to the substantive focus upon crisis, there is no justification for eliminating their consideration in order to achieve consistency with others' usage of a sociological term. Indeed, the very smallness of some of our organizations presents a contrast which conceivably could affect the likelihood of innovations.

In sum, the focus of the study is upon "organizational innovations in anticipation of crisis." Where (1) Crisis is a major emergency situation for which normal and routine social organizations are inadequate. The two crises under study are natural disasters and civil disturbances. (2) The organizations studied are those with clearly acknowledged responsibility to respond should their communities experience one or the other type of crisis. (3) Innovation is a purposeful

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this situation, and the expressed belief of police officials that a
civil disturbance was highly improbable, the police were undertaking
equipment purchases and training designed for civil disturbance
response. This example provides an oddly shaped piece to our puzzle,
but also an important clue to its overall solution. These changes, even
though not thought to be needed, were being made at no cost to the
department. Federal funds supported the program on a fifty-fifty basis.
The government bought the equipment as its contribution and the depart-
ments provided the training as its "in kind" equivalent. The changes
made in this police department are "painless" in two senses. They did
not disturb existing arrangements of interest or the structure of the
department, and they did not cost anything.

The need for this study is defined by the sociological puzzle
focused by the prior research of Anderson and Warheit and refined by the
continued field experience of the DRC. The general problem is to continue
exploration of organizational preparations for crisis response. The
essential steps in further exploration of the problem are expressed by
the following requirements: (1) The need to analyze the organizational
nature of changes in anticipation of crisis response, separating the
trivial from the organizationally significant. (2) The need to search
further for possible explanatory conditions. (3) The need to examine
and compare additional cases. (4) The need to explore the basis for the
contrasts between changes in anticipation of natural disaster as opposed
to civil disturbance responses.

One significance of the study resides in the substantive research
tradition established by Anderson and Warheit. The study is a contri-
bution in this tradition in the sense of addressing the above four
requirements for a more satisfactory solution to our puzzle. But, as
shall be indicated in the concluding chapter the implications of the
study are not limited to this substantive tradition. The study provides
insights into the general questions of the nature of organizations and
the problem of social change.

The Focus and Objectives of the Study

Anderson focuses on the organizational consequences of natural
disaster responses. In his analysis he considers many changes which were
partially explained by the earthquake experience but which were not
preparations for subsequent responses. In view of the fact that the
present study includes organizations which have no crisis experience, the
focus will be limited to organizational changes designed to improve
responses to crisis. These are not consequences of crisis, but conse-
quences of anticipation of crisis. The only exception to this delineation
of focus is to include changes which are not designed to improve responses,
but to prevent crisis or reduce its intensity. This exception is
necessary to include some of the changes found in anticipation of civil
disturbances. Some of the changes undertaken by police departments, for

alteration of some controllable aspect of an organization by those having authority to do so. (4) The innovations examined are those intended to prepare the organization for crisis response or intended to prevent crisis or reduce its intensity.

Within this focus the objectives of the study are modest, but important steps toward a more complete understanding of organizational innovations in anticipation of crisis. The definition of the objectives reflects the current state of the puzzle within the research tradition established by Anderson. The initial and most crucial objective is to study the nature of organizational innovations which anticipate crisis. We want to know how much and in what ways innovations change their organizations. How has each innovation altered an organization as an organization? Meeting this objective builds upon the literature on organizations, but primarily it must depend on examination of data describing innovations, to determine how they may be adequately conceptualized and classified.

Another objective is to discover conditions for innovation in anticipation of crisis. This objective depends on the first. We must be able to adequately describe and classify the range of organizational innovations in order to group similar cases and to separate dissimilar ones. Different phenomena potentially have different antecedent conditions. Prior research suggests experience of crisis response is a major condition for innovation; however, the data described by Anderson (1969) and Warheit (1968) clearly indicates that experience alone is not a potent condition. Many organizations experience crisis demands; only a few innovate in case they meet them again. Thus, this study takes as its objective the task of identifying additional conditions underlying organizational innovation in anticipation of crisis.

Thus, there are three major objectives of this study: (1) to describe and classify the organizational characteristics of innovations in anticipation of crises; (2) to suggest conditions which are promising explanations of patterns of organizational innovation.

Plan of the Report

The study is organized into five chapters. This first chapter has introduced the focus and objectives of the study and the prior work on which they are based. The second chapter compares these research problems with existing literature on organizations, introduces the methodological approach, and describes the study's data sources. The current literature on organizations emphasizes different problems than those of this study. The study addresses problems in relatively neglected areas of the literature. The methodology of the study is qualitative and exploratory -- a strategy befitting the present state of the research tradition, the relationship of research objectives to current literature and the nature of the study's data. There are three sets of data. We analyze

seventy-three organizations and their innovations following major natural disasters in four American cities. We also study the innovations in anticipation of civil disturbances by sixteen fire departments and fourteen police departments.

Chapter III takes innovations as its level of analysis. Five hundred seventy-four innovations are found in the three sets of organizations. It introduces a framework of concepts to classify the organizational characteristics of innovations and then describes the ways the innovations change their organizations. In Chapter IV the level of analysis shifts from innovations to organizations and the objectives of analysis shift from description to generation of explanatory hypotheses. Several conditions influencing organizational innovations in anticipation of crisis are suggested. Emphasis is placed on conditions for innovation which are not well represented in the literature and which, of course, are within the scope of those which can be suggested by our data. Finally, Chapter V summarizes major points of the report, makes brief comparisons with major emphasis within the organizational change literature and projects other possible lines of research.

FOOTNOTES: Chapter I

1. Throughout, the term <u>natural disaster</u> refers to community crises caused by the sudden onset of natural agents such as floods, earthquakes, hurricanes and tornadoes. Certain technological disasters are similar enough in their problems and social consequences to be implicitly included in the use of the term for this study's purpose. Thus, explosions, power failures, and other technological failures which have rapid onsets and whose threat to the communities in which they occur require major responses beyond routine emergency operations are included.

2. <u>Civil disturbance</u> refers to the "riots" occurring in central cities of urban United States during the latter half of the 1960's.

3. <u>Domain</u> of an organization refers to (1) problems for which an organization is responsible, (2) the circumstances under which it is permissible or necessary for an organization to address these problems, and (3) the actions appropriate and legitimate for meeting these problems. This usage is adapted from Sol Levine and Paul E. White (1961: 89-97). See also Thompson (1967: 25-39).

4. Anderson suggests that some changes might yet occur because his data was collected only one and a half years after the earthquake. Subsequent data collection in 1967 indicates that this is not the case. At that time the state civil defense plan for disasters which Anderson reports as a change still had not been completed. In addition, only one of the state agencies which were to provide annexes to this plan had completed the project.

5. This was partly because two of the crises studied occurred only shortly before data for the study were collected, and thus, were less suitable for examining long-term changes. However, one of these two cases provided the greatest extent of long-term changes encountered in the study. Apparently, the difficulty in finding conditions related to long-term change inheres in the phenomena and are not a consequence of the time of data collection.

CHAPTER II

POINTS OF DEPARTURE, METHODOLOGICAL

PROBLEMS AND METHODOLOGICAL APPROACH

This chapter describes the methodological approach of the study. The approach is exploratory and qualitative. The necessity and justification of this approach are in part a reflection of the current status of knowledge in the research tradition and in part an extension of a general methodological position. The chapter begins with a summary of the state of knowledge on organizational innovation in anticipation of crisis response. This assessment along with a review of selected literature on organizational change indicates that an exploratory methodology is most suitable for the objectives of this study. The second section of the chapter describes the methodological approach. This approach is adopted in view of the nature of the problems found within the research tradition and literature and the data available to study them. The third section of the chapter identifies three sets of data which are studied. A final section briefly describes some of the procedures used in the study.

Points of Departure

This study has emerged from a variety of constraints and opportunities. This section summarizes the guiding influences of two foundations of the study, the prior research within our specific research tradition and the more general influence of existing literature on organizations and organizational change. The function of the research tradition is to provide problems specific enough to begin to solve. That of existing literature is to suggest the most suitable means of advancing sociological theories of organizational change.

Prior Research and Field Observations

The legacy of prior research closely related to this study is one of discovered, but partially unsolved problems. The Anderson (1969) and Warheit (1968) studies are important in their own right. Anderson clearly describes the organizational aftermath of a major disaster; his is a fitting complement and conclusion to a wide range of studies of the Alaska Earthquake. Warheit found a number of interesting patterns in short-term adjustments in inter-organizational relationships during responses to crises. Happily, however, both studies have brought to light and left other problems for subsequent research. This legacy has two major features. First, these studies make clear the need to examine

the organizational characteristics of innovations. Second, these studies
and continued field observations call into question the value of crisis
experience for explaining innovations.

The previous studies have not systematically examined the nature
of the innovations they studied. They concentrate upon conditions which
foreshadow innovation. However, it is clear from the descriptions they
provide and from analysis in passing that the majority of the innovations
they studied were of minor consequence as changes in organizations where
they took place. Explanation is poverty stricken without a clear con-
ception of what is being explained. "What"? is always a relative question.
Our present concern is with organizations. Therefore, we will attempt to
approach the problem of what is changing by describing the organizational
characteristics of the innovations we observe. In effect, we will
describe the ways in which various innovations changed the organizations
where they took place.

The second problem left by prior research and augmented by continued
field experience is one addressed directly by Anderson and Warheit. They
hoped to suggest conditions explaining changes following crisis response.
As indicated in Chapter I, findings on this count are ambiguous. The
studies show that changes _can_ follow experience of crisis response and
that several social conditions such as "organizational learning,"
"increased environmental demands," "increased environmental support,"
and "experience of new demands," _can_ be preconditions for organizational
changes. However, in most cases these conditions lead to only minor
changes. More crucially, these conditions are not confined to those
organizations which do change. They often apply to cases where change
does not occur. The obvious inference is that important conditions
separating those organizations which do innovate from those which do not,
have not yet been identified. Field observations of other cases suggest
that anticipation of natural disaster can lead to more substantial
patterns of change when certain facilitating interorganizational factors
are present. They also indicate that organizations which anticipate
civil disturbance responses tend to undergo greater levels of innovation,
often independently of actual or realistically anticipated experience.
Thus, the second problem highlighted by our research tradition is to
continue the exploration for additional conditions affecting organizational
innovation.

The Literature as a Point of Departure

Organizations are systems of human activity predicated upon social
relationships and social norms and regulated through social interaction
(Weller and Quarantelli, 1973). The present analysis focuses upon
enduring and _formal_ organizations. Enduring organizations contrast with
ephemeral organizations which are also predicated upon social relationships
and social norms, but are short-lived (Greer, 1956). Formal organizations
are those with a formally conferred identity. By and large, they are

brought into being for specific purposes (Blau and Scott, 1962). To a major degree formal organizations endure by virtue of fulfilling (or successfully circumventing) expectations authoritatively held for them. They are social patterns with responsibilities. Among the responsibilities of the organizations of this study are responses to natural disasters or civil disturbances.

These organizations exist in normal, non-crisis contexts. Thus, besides crisis responsibilities, they have routine duties that are pursued in repetitive ways. These patterns of behavior rest upon and can be explained by structures of social relationships and social norms. Such enduring relationships and institutionalized norms may be formal or informal. That is, within formal organizations, unofficial structures of norms and relationships predicate a significant portion of the overall patterned activity. Both formal and informal structures are essential for understanding organizational action; however, the present study of necessity focuses only upon formal organizational features.

Formal aspects of organizations which may be changed include both everyday organizational routines and standby mechanisms designed for the occasion of disaster responses. Organizations develop latent social arrangements for responses to non-routine situations. They also acquire material resources relevant to meeting crisis responsibilities. We shall be concerned with innovations which change any of these formal organizational features. We wish to discover the organizational characteristics of innovations anticipating crisis responses and the conditions which influence the adoption of these innovations.

Given this focus and these objectives, the current literature on organizations might provide a foundation for the present study in at least two ways. First, other research studies with similar data sources and research problems may have been undertaken. These would provide procedural models for the present study to follow. Failing this, the literature may have taken up comparable research questions which would provide a set of findings about the nature and conditions or organizational innovations. Such findings would provide guides and reference points to further specify our research questions. However, the literature on organizations provides neither procedural guidelines, nor a body of findings as reference points for a study with the focus, objectives and data sources of the present one.

The literature which could have direct bearing on formulation of research questions and research procedures for this study is reviewed and exemplified in the following paragraphs. None of the studies reviewed provide direct models for defining the research questions or selecting the research procedures of this study. Thus, points of contrast between the literature and this study are emphasized. [1] The literature is reviewed in two discussions. First, research studies on organizational change are considered, moving from a few major case studies to some more recent studies which compare larger numbers of organizations. Second, the contributions of a few discursive commentaries on organizational

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change and the more general topic of social change are briefly assessed. Our goal is to show the literature's bearing upon the initial phases of the present study.

Studies of Organizational Change

A few studies besides those by Anderson (1969) and Warheit (1968) take approximately the same substantive focus as our study. They report social changes by following major crises. The earliest of these studies was reported by Samual Prince in 1920. His study of the December 6, 1917 explosion in the harbor of Halifax, Nova Scotia, reports several organizational changes in the two years immediately following the disaster. Changes in community health organizations and harbor regulations were the most far-reaching. J.E. Ellemers' (1955) study of the Holland flood disaster notes the establishment of new social welfare and community organizations as a consequence of disaster experience. Seymour Weisman's (1958) case study of a Norwalk, Connecticut, flood also reports the creation of new organizations. Bates and his colleagues (1963) found a number of social changes following Hurricane Audrey's impact in a rural Louisiana parish. Drabek's (1968) case study of the Explosion City notes several social changes even though his data were collected soon after the disaster.

For the most part these studies communicate the same general points as provided by the Anderson and Warheit studies, often without the same precision of sociological focus. These studies provide more depth to the research findings that social change can follow natural disasters. Some of these changes are organizational innovations, and some of these are made in anticipation of future responses to disaster. As in the cases of the more recent studies, systematic analysis of the organizational nature of innovations following disaster and exploration for explanatory conditions other than "experience" are not carried far. Additionally, the research questions of these studies differ from ours. They search for changes which are a consequence of experience of disaster, while we are concerned with a slightly different focus on innovations that prepare for crisis response.

What, then, do these prior studies of social change associated with disaster provide as a starting point for the present research? They do not provide explicit models of research procedures, nor do they provide a set of findings substantially different from Anderson and Warheit. They do legitimize the present research effort as one which carries forward unresolved research problems into a different substantive setting. The present study extends the study of crisis-related change to civil disturbances and to social contexts independent of direct crisis experience.

Also, there are many studies of the more general topic of organizational change. The present review is not exhaustive, but it does not knowingly exclude cases contrary to the interpretation presented.

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Case studies of changing organizations are most numerous. We mention
only major ones. Among the most influential is Phillip Selznick's (1958)
study of the interplay between the Tennessee Valley Authority and its
environment. He describes a process of organizational transformation
where influential leaders who resisted the TVA's encroachments upon
their local prerogatives are co-opted into the decision-making processes
of the TVA. The consequences include a lessening of local resistance
to the economic programs of the TVA, but also the sacrifice of the TVA's
more visionary social reform goals.

A second major case study is Alvin Gouldner's Patterns of Industrial
Bureaucracy (1954). Among its several themes, this study of a gypsum
plant analyzes the organizational change accompanying the arrival of a
new manager with instructions to make plant operations more profitable.
The new manager was generally more successful in bureaucratizing the more
predictable and routine aspects of plant operations. He enjoyed less
success in controlling the organizational groups engaged in the more
uncertain mining operations. Another study on changing managements
styles is Richard McCleary's (1957) report of organizational changes in
the social structure of a prison following a shift from authoritarian to
liberal management. He stresses the role of communication patterns in
bringing about the transformation.

These case studies[2] present a clear contrast to the present research.
They all have the virtues and drawbacks of case studies, but these are
different from the strengths and limitations of this study. Good case
studies delve deeply into the social reality of the organization being
examined. In particular such studies are excellent for locating and
reporting the operation of informal organizational structures, but they
pay the price of limited scope by examining only one organization. Our
requirements are exactly the opposite of what would be accomplished by
a case study. Our data (described near the end of this chapter) is not
of sufficient richness and depth to provide the detailed and intimate
knowledge necessary for a case study, but it can provide information
over a large number of cases if we restrict our focus to formal innova-
tions. This fits the needs of the research tradition precisely, because
we do not particularly need in-depth analysis of one or two cases as
much as we need to describe and map the range and patterns of innovation
among as many diverse organizations as possible.

Logically, and to a great extent temporally, the trend is away
from both the strengths and weaknesses of case studies toward the differ-
ent set of gains and losses found in comparative studies of two or more
organizations. Studies comparing two organizations include Blau's
Dynamics of Bureaucracy (1955) and Dill's (1958) study of two Norwegian
business firms. Blau's study is of two government agencies and he asks
what transforms a conservative organization into one promoting change
in itself as well as its environment. He finds as employee security,
employee professionalization and organizational needs to adapt increase,
so does the likelihood of transformation into a change-oriented

organization. Dill finds that the degree of managerial autonomy within an organization is directly related to the ability of the organization to adapt to environmental changes.

Robert Michels' classic, _Political Parties_, (1958) traces the surprising tendency of German political parties and unions with very strong democratic ideologies to, nevertheless, develop concentrated internal control by oligarchy. He, however, did not really compare organizations because he works from a group of examples which all show the same tendency toward the "iron law of oligarchy." A more recent multiple organizational study by Phillip Marcus (1964) provides a set of examples which compare interestingly with Michels. Marcus too reports a study of organizational change in labor unions; this time from the 1930's and 1940's in the United States. Instead of finding only a trend toward oligarchy, he finds competing trends pushing for both oligarchy and democracy. In his study the entrenched oligarchies of local union organizations were dislodged by changing environmental conditions in the marketplace, technology, and legal regulations. This resulted in realignment of power and control in the direction of democracy.

Burns and Stalker (1961) provide a multiple comparative study of organizational change. Theirs is an especially erudite and insightful work. They studied the adaptation of British electronics industries to changing market and competitive conditions. They conclude that patterns of organizational change are related to the ways in which management of the electronics firms are internally integrated. Organizations with "organic" management integration are better able to adapt to a complex and shifting environment than those with "mechanical" management integration. Organic managements are characterized by manager loyalty to tasks and commitment to flexible adjustment to changing circumstances. Mechanical managements have managers loyal to their superiors and committed to traditional patterns of action.

There are few other multiple comparative studies of organizational change.[3] Burns and Stalker published their study in 1961. In the most recent review of the literature on organizational change, Hage and Aiken (1970) encounter little difficulty in singling out the Burns and Stalker study as the best single empirical work on the problem of organizational change. This certainly is a commentary on the state of research on organizational change.

These few multiple comparative studies of organizational change have two direct implications for the formulative stage of the present research. First, there are so few studies that simply describing and mapping out patterns of change in the 103 organizations of this study will be of value in itself. We have barely begun to outline the sociological problems in this area. Even the most tentative and exploratory research is helpful in these circumstances. Second, these studies' substantive and theoretical foci are not similar enough to the current study to provide direct models of research procedures or findings which

help to specify our research questions. The study must proceed in terms of the problems it lays out for itself, rather than ready-made ones. The questions of the present study are not so esoteric as to have no bearing upon general questions of social and organizational change. These relationships, however, will be derived from the present study rather than provide a basis for it.

Discussions of Organizational and Social Change

There is little research in the area of organizational change, but this does not mean there is nothing written in the area. On the contrary, it is a central problem which again and again is the subject of discussion. This is even more the case with the general topic of social change. The discussions of organizational change are uniformly not helpful as direct models for the present research. A few discussions of social change are helpful in providing general orientations.

A common strategy for discussions which move "toward" a theory of organizational change is to present some abstract model, or to attempt to isolate one main principle. For example, James Wilson (1966) uses March and Simon's (1958) notion of a rewards-contributions balance as the essential tension which equilibrates organizational structures. He then hypothesizes that conception, proposal and adoption of organizational changes are all mainly influenced by the way organizational diversity affects the balance of rewards and contributions. Cadwallader (1959), on the other hand, does not provide a central mechanism of this sort, but he does suggest organizational change be viewed through a cybernetic systems model. Burns' article, "The Forms of Conduct, " (1958) suggests another perspective -- to view enduring aspects of organizational structures as "routine substitutes" for innovation. Thus turns the problem around. Now change is normal and we have to explain stability. William Starbuck (1965) provides the most comprehensive review of organizational growth, but his carefully reasoned piece deals mainly with the narrow topic of changes in organizational size and age.

Finally, Hage and Aiken (1970) provide a theory in axiomatic form which relates "program change" (i.e., not structural change) to eight variables. As Hage and Aiken themselves note, in its substance their theory reproduces the findings of Burns and Stalker (1961). Higher rates of program change should be found in organizations that are highly complex, have highly educated and professionally oriented members, and have a highly specialized division of labor. On the other hand, centralization of authority, formalization of rules, steep stratification of reward systems, and high productivity all tend to reduce rates of program change. In its formal aspects, their theory is a complete capitulation to conceiving of organizations as systems of variables. For our present research problem, this approach is entirely inappropriate, because it imposes a closed, conceptual and theoretical system at the outset. Our research tradition, and perhaps the area of organizational

change as a whole, are not developed enough to enjoy the comfort and control allowed by this radical limitation of focus. We must begin with a more empiristic approach -- searching our data for patterns that can be qualitatively represented and distinguished.

These examples are typical. Besides the specific studies of our narrow research tradition, the literature on social and organizational change provides neither a basis for simplified redefinition of our research problem nor direct models of research procedure. Therefore, the primary uses of this literature will not be for initial research design. Instead, the literature is used to sensitize us to general issues, to provide conceptual tools as they are necessary, and, most importantly, to serve as standards of comparison with the theoretical results of this study. Moore (1960, 1963) stresses the pitfalls of viewing societies as equilibrated functional systems. Social systems sometimes do change in response to structural tensions, but they are not so tightly integrated that problems in one sector necessarily reverberate throughout. Societies are "tension-management" systems and can tolerate all sorts of contradictions and strains without making automatic functional adjustments. Therefore, social change cannot be explained by mere reference to a structural situation. Thus, the present study intends to locate additional conditions and mechanisms besides "organizational learning" that are necessary for organizational innovation. Smelser (1967, 1968, 1972) goes even further toward specifying the essential formal components of any adequate theory of social change. Especially, the present study takes seriously his view that a theory of social change is trivial without a clear conceptualization of what is changing. Thus, the study expends most of its effort to discover the organizational characteristics of the innovations it examines.

The Methodology of the Study

Methodology comprises the position of the researcher on the nature of sociological knowledge and the approach one takes to generate it. Techniques, on the other hand, refer to the specific steps and strategies used to relate the empirical world and sociological theory. In the sense of this distinction, many discussions of sociological "methods" presuppose a methodology which stresses verification of theory and explicitly discuss only techniques. [4] Verificational techniques of data gathering and manipulation are quite appropriate and powerful in research situations which warrant their use. However, other methodological positions not only can be taken, but often must be taken. The state of knowledge within a research tradition, the relationship of current theory to research problems, and the ability of the researcher to measure selected attributes from a known population all influence the nature of the sociological knowledge a given study can produce. Consequently, these factors influence the methodological position adopted for this study and ultimately the techniques employed.

The state of knowledge within the research tradition constitutes a puzzle which does clearly indicate the factors separating organizations which innovate from those which do not. The relationship between the experience of crisis responses and innovation is brought into doubt by rather low levels of innovation following disaster as compared with high levels of innovation in civil disturbance organizations without experience. Also, the organizational nature of innovations has not been adequately described. There is presently no basis for treating all innovations as equivalent social effects. There is some indication that the innovations vary widely in the extent and ways which they change organizations. Therefore, they do not comprise a single class of essentially similar social features. The innovations require explanation by different conditions. The overall uncertainty about the range of social effects to be explained and the conditions appropriate to explain them makes selection of specified hypotheses difficult. In terms of the current state of the research tradition, theory generation, rather than verification, is the more satisfactory methodological approach.

Despite the difficulties in deriving justifiable hypotheses from the research tradition, such hypotheses could be generated from existing literature on organizations (for example, see Kreps, 1971). Even so, this is not the strategy chosen for the present research, because there are two basic problems in the bearing of the current theories of organizational change upon the organizations and changes that we are studying. First, the literature emphasizes major changes in organizations; that is, those which alter the organization substantially or relate directly to problems central to the organization's domain. In contrast, the present study focuses in large measure upon innovations which are only minor changes. Second, current theories assume a much more narrow conception of organizations than is appropriate for the population examined in this study. Our organizations range from small, simple offices to large, complex organizations. The literature deals primarily with the latter. Any narrowing of focus to include only large complex organizations would eliminate a significant proportion of the organizations most relevant for a study of changes related to crisis. It would, thus, prevent inspection of a community's entire population of organizations with crisis responsibilities. Examples found in prior field work indicate that innovations in anticipation of crisis are influenced by the system of local organizations sharing the problems of response. Eliminating significant proportions of these organizations makes assessment of the influence of this system impossible. The actual problems within our substantive focus will not be solved by narrowing our focus to a few hypotheses developed with other phenomena in mind.

Nor does the nature of our data indicate a verificational approach should be favored over further exploration. For the most part the study uses available data. And, these data are not suitable for verificational research. The data are for selected cities and organizations. They do not represent the larger population of organizations with crisis responsibilities in any known way. They must be regarded as populations themselves rather than any sort of systematic sample. The inferences

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which can be made from this type of data are suggestive rather than of known probability. Additionally, the concepts with which the data are described and compared were selected and related in view of the actual data used. Therefore, there is no justifiable way to view hypotheses employing these concepts as prior to the research. A verificational methodology would require the acquisition of additional data. An exploratory methodology can make use of presently available data which have either not been analyzed at all or have been used for other purposes. Even if a verificational methodology were preferable for other reasons, the potential of these data should not be discounted in favor of data beyond the means of a single researcher to collect. There is some plain merit in using what is at hand.

Thus, there are three reasons directly related to this specific study which justify an exploratory methodology over verification. Neither the research tradition nor current theories of organizational change suggest specific hypotheses clearly related to research problems. Also, available data are potentially valuable, but not suited to a verificational study. There is also a more general justification for the present research strategy. It is based not on convenience, but principle. It argues that qualitative, comparative, and inductive studies are in many ways more useful than narrow, precise verification.

The alternative to an exploratory strategy -- that of verification of precisely drawn propositions -- is dependent upon prior adequate description of the concepts of the theories to be tested. Samuel Stauffer, the sophisticated technician of hard data research, has observed that verification of sociological theories requires the phenomena under study be conceptualized and adequately described (Dubin, 1970:222). Dubin (1970: 225) adds that description is essential for defining the conceptual units of a theory, its propositions, and the boundaries of its scope. Although, in a certain logical sense descriptive research is prior to hypotheses verification, both run concurrently at all times in any field of science. Dubin feels the balance of the two at any time depends on the richness of a field's theory (Dubin, 1970: 228). Richness refers to elegance and fullness of conceptual development, as well as the completeness of correspondence between the theory and the nuances of variation in the phenomena captured by the theory. As revealed in our earlier discussions, neither conceptual refinement nor correspondence between our substantive focus and theory is in neither sense rich.

Thus, of two identifiable research strategies -- one to prove the adequacy of a theory, the second to improve theory -- ours is the second. For the former strategy, innumerable pages develop and criticize various techniques of research. For the latter, very little in the way of established techniques have been debated and criticize various techniques of research. For the latter, very little in the way of established techniques have been debated and agreed upon. This does not mean that exploratory research is rare, not only that its procedures are relatively uncharted and uncodified. Even though they deal more with a general

methodologican defense of nonverificational research, Glaser and Strauss (1965) come closest to providing programatic techniques for this type of research. Their "constant comparative method" provides explicit rationales for choosing cases and ways of comparing them.

Glaser and Strauss advise numerous comparisons across widely varying cases. This procedure samples diverse factors which might under one condition or another affect the social pattern under study. From their perspective, diversity of possible influences is desirable, even necessary, for identifying factors which hypothetically affect dependent variation. Control over the selection of diverse cases is established by the "constant comparative method." The researcher analyzes cases to isolate dimensions influencing social outcomes in which he is interested. Then he returns to the empirical world of his subject, next selecting a case different enough to allow previously undiscovered sources of variation to be found. This two-step procedure is extended into an alternating process of analysis and adding to diversity through sampling significantly different cases (Glaser and Strauss, 1965).

In the present study the value of diverse cases is recognized. However, the procedure by which the diversity of the present cases was obtained is significantly different. Here, because the sample was selected and circumscribed for a much larger ongoing study, there are two important differences. First, the total range of diversity, while considerable to the point of confusing the analyst, is limited. Our data do not afford some comparisons it would be nice to make. Second, all of the cases were selected before the present study was conceived. Consequently, this study cannot freely pursue the exact comparisons which sometimes seem most fruitful. With the constant comparative method, dimensions of diversity can be controlled by selecting cases after the needed differences become apparent. In the present study, all of the cases were selected prior to any analysis. Thus, the available diversity is circumscribed and extended before ideas about desirable comparisons are generated. Under these circumstances, it is impossible to insure either the most suitable pattern of differences or most desirable limitations of diversity to employ statistical controls.

However, these difficulties do not appreciably reduce the potential of the study. We are at a point in the development of organizational theories where even a strictly descriptive study, if made in a little-developed area, can be a reasonable contribution. In the area of organizational change, there is no firm conception of what exists to be explained. This is the descriptive objective of the present study: to map out the patterns of innovation which invite explanation. This aspect of the study is an example of "mapping research" described by Simon (1971: 71) which seeks to outline the major substantive features of a phenomena through empirical investigation. Although, this type of research is not often stressed in the sociological literature on methods of research, it is hardly rare and it is of utmost importance as a basis for and a counterpoint to verificational studies.

The study has also the second objective of generating hypotheses, by identifying conditions for the adoption of innovations in anticipation of crisis. The plausibility of these hypothetical conditions does suffer because of failure to meet either verificational or some other well codified model of research procedure. The primary advantage of a well-codified and often-used procedure is the norms which build up about how to interpret research results. The inability to match well articulated procedures does not make the present study unimportant, although it does obscure exactly how broadly we should interpret its results. Of course, the answer to this problem is not to abandon the study, but to use caution in interpreting its results. Because one purpose of this study is to generate hypotheses in a relatively barren corner of the theory of organizations, tenuous extrapolations from data are permissable, if not highly prized.

In the last analysis, then, what are the procedural guidelines of the present study? They can best be defined by their goals. We try to describe the organizational characteristics of innovations and factors which affect them. As far as the actual research techniques go, the best description is simply to say we are looking for patterns in the data. As Sjoberg (1960) says in another context, we are attempting to impart meaning to a complex set of data. At its close this chapter returns to some of the actual procedures used to pursue the study's research objectives with an exploratory methodology. First, however, some consequences of this methodological approach are discussed. Then the data of the study are introduced.

The study's emphasis on discovering qualities and patterns of what is changing as well as suggesting hypothetical explanations introduces a great deal of complexity into discussion of the "dependent variable" of the study. Usually sociological studies choose or assume simplicity in what is to be explained and then introduce complexity when suggesting conditions as explanations. This tendency is, perhaps, because of views of science which stress explanation. However, it is no less scientific to seek to conceptualize phenomena in fruitful ways. If the strain toward explanation leads to oversimplification of what is explained, the resulting explanations are not too useful. That is, if qualitatively different social phenomena are lumped together and treated as a single quality, then explanation may very well obscure understanding. If a new generator and a new organizational subunit are classified as equivalent social effects, then clear patterns of explanation will be hard to find. Thus, the initial emphasis on elaboration of qualitative differences among innovations is necessary to eventually improve the clarity of relationships between innovations and their conditions.

At the same time elaboration of qualitative differences among innovations is necessary, its complexity complicates the research. Because most studies assume a unitary quality for what they explain, complexity in explanatory factors is not too cumbersome. Here, because a number of distinctions are introduced into the discussion of the innovations themselves, the additional complexity encountered in offering hypothetical explanations becomes unwieldy. Qualitative analysis of

organizational characteristics of innovations reveals a number of important differences among them. Thus, we are dealing with several distinct social effects, each of which can have several explanatory factors suggested for them. As a result, efforts to generate simple hypotheses suffer. This problem is not adequately solved in the present research. The compromise which takes the place of a solution is to describe conditions which seem to be influential without linking them adequately into a larger theory. Thus, many elements which may be useful for the development of theory are isolated, but are not clearly integrated.

Another factor tends to reduce the coherence of the study. When verificational studies are undertaken, there is considerable justification for selecting a sample for study which reduces the number of factors at play on the dependent effect. In testing hypotheses, such a reduction in complexity enhances the definitiveness of the test. We are more confident that the efforts observed are attributable to the particular conditions being tested. In exploratory research, however, the greater the number of potentially influential conditions which are admitted to analysis, the greater is our confidence in those which we select as hypotheses. In other words, the exploratory researcher should expose his "insights" or "inferences" from the data to as many disconfirming experiences as possible (Arnold, 1970: 147-150). This ideal is pursued in the present study by examining three separate sets of data. All are slightly different, but they allow a broad range of factors to be compared for their effects upon innovations. The same specific questions often cannot be put to each set of data, but their variations in strengths and weaknesses allow a broader exploration for suitable hypotheses, and in some cases hypotheses generated from one set of data can be further assessed with another set.

The study, then, takes an exploratory approach, which emphasizes adequate description of organizational changes before seeking explanations for them. Problems of unwieldy complexity are encountered in linking diverse qualitative differences in organizational innovations with equally diverse explanatory factors. However, the loss of coherence occasioned by these problems is far outweighed by the advantages of maintaining diverse objectives and an exploratory methodology. First, and foremost, the steps taken in this study are those presently appropriate to the research tradition which prompted it. We need to know the range, variety and nature of the organizational forms of innovations in anticipation of crisis. We need to have additional conditions beyond "organizational learning" suggested as explanations of patterns of organizational innovation.

This exploratory approach also meets a need in the literature on organizational change. The absence of comparability and mutual bearing among studies of organizational change testify to the need to map out the range and contours of the area. The study's methodology is appropriate for less particularistic reasons too. Satisfactory scientific practice addresses the empirical world in more diverse ways than is often

supposed. Though essential, descriptive studies are often denigrated.
A good descriptive grip on social phenomena is absolutely necessary to
anchor sociological explanation. Further, the search for and discovery
of conditions which bring about organizational change do not require
sophisticated collection and manipulation of data as much as the
curiosity to look at data and the perspicacity to perceive its patterns.
The methodological approach of this study is one of several sound ways
to go about doing useful sociology. It is the approach appropriate for
the present condition of research on organizational innovation in
anticipation of crisis.

The Data

The study examines three sets of data: (1) Seventy-three organi-
zations and their innovations in four cities following disaster experience;
(2) Sixteen fire departments and their innovations between 1965 and 1971
when many fire departments were experiencing responses to civil distur-
bances; and (3) Fourteen police departments and their innovations during
the same period. These data were collected for three separate studies,
and the information available from them is not directly comparable in
some instances. But, the three sets of data do provide information
bearing upon the same sociological problems.

The data for seventy-three organizations in four cities following
disasters come from two sources. One is a reanalysis of the data from
Anderson's (1969) study of long-term changes following the Alaska
earthquake. The other three disaster cities are those for which changes
are described by Adams, Stallings and Vargo (1970). The Disaster
Research Center had studied the immediate responses of each of these
cities during disaster. The data are the actual descriptions of
innovations and organizations given by these two sources. These, in
turn, are based upon interviews with informants in each of the organi-
zations. Informants were chosen for their knowledge of general organi-
zational matters, and, especially, their abilities to relate the
presence or absence of change as a consequence of the organization's
disaster experience. Our use of these prior studies is possible only
because their authors provide detailed descriptions of each change found
in each organization.

Not all of the innovations, nor indeed all of the organizations
reported in these studies, are incorporated into the present study.
Organizations which change as a consequence of disaster, but not because
of response to the disasters, are excluded. For example, Anderson's
descriptions include an electric production company whose primary involve-
ment with the earthquake was long-term reconstruction from its physical
impact upon facilities. Also, some organizational changes which are
consequences of disaster experiences, but are not innovations in anti-
cipation of future responses, are excluded. For example, one individual

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was fired for low level of participation during his organization's disaster response. This is a change, but not an innovation for future crisis responses.

The data from police and fire departments was collected for a recent study reported by Kreps (1971). Kreps has analyzed this data in a verificational study designed to test his theoretical model relating the concepts of organizational intelligence and organizational change. Despite this use of the data, its nonverificational potential has not been used. While none of these data were collected with this particular study in mind, all are suitable for exactly the purposes demanded by our previous assessment of the research tradition and literature on organizational change. The data provide descriptions of innovations permitting analysis of their organizational characteristics.

Data for the sixteen fire departments are from fifty-nine in-depth interviews with fire officers. The departments are from cities throughout the United States. These cities are all included in an ongoing study by DRC and are chosen for a number of varying reasons, including past civil disturbances and disaster experience. Most of the same cities are represented among the fifteen police departments for which we have data. For a variety of reasons, two cities where fire department data was collected, police data was not. One city where police data was collected, fire department data was not. There are sixty-two in-depth interviews from police administrators from these fifteen departments.

Two other sources of data must be mentioned. First, the ongoing DRC studies of crisis-management in sixteen cities have provided a number of distinct impressions about preparations for disasters and civil disturbances. For example, one clear impression from these data is that much higher levels of organizational innovation have taken place in anticipation of civil disturbances than in natural disasters. This overall generalization is not confirmed by the analysis of this study, but it did prompt the inclusion of both natural disaster and civil disturbance innovations. Another clear impression from this data is that police departments underwent greater levels of innovation in anticipation of civil disturbances than any other local organizations. Fire departments seem to be second in level of change anticipating civil disturbance responses. Thus, with this broader body of data in mind, it can be seen that our present study picks populations of organizations with low levels of innovation for crisis response (disaster organizations) as well as high (police and fire departments). Conditions which are crucial for organizational innovation in anticipation of crisis may be shown in clear contrast by comparing the higher and lower ranges of organizational innovation.

The second additional source of data is eleven interviews with national and regional organizations which often assisted their local counterparts in preparations for civil disturbances. These interviews provide information on the nature and extent of encouragement and support various local organizations received in civil disturbance preparations.

These data provide a basis for interpreting differences in innovation level between police and fire departments and (by inference) disaster organizations, too.

These data are appropriate to our substantive focus, our research questions and our methodological approach. Next we briefly introduce some of the actual procedures used to extract systematic descriptions of innovations and hypothetical explanations of these patterns from them.

Procedures of the Study

We have decided the focus of the study is on organizational innovation in anticipation of crises. Our research objectives are to search for patterns in the organizational nature of these innovations and the conditions which explain them. Our methodology is qualitative and exploratory. Our data are three populations of organizations, including organizations which have responded to natural disasters and police and fire departments anticipating possible responses to civil disturbances. Now we turn to the procedures used to implement the study circumscribed by these decisions.

As we have indicated above, the research techniques of qualitative and exploratory research are not well codified nor have the merits of different possible techniques been well debated. Disciplinary norms guiding the selection of qualitative and exploratory techniques have not emerged. As a result, the research techniques of this study are rudimentary, but they are not simple. Controls by the researcher over these techniques are not by prior specification of step by step procedure (as is the case for many verificational research designs). Rather, control over the nature, direction and results of this study's procedures is accomplished by repeated reference back to the defining foci and research questions of the study.

The first problem addressed by the study's procedures was to discover and systematically express the organizational characteristics of innovations. The resulting system of concepts is introduced in Chapter III and is summarized in that chapter's Table 1. The following discussion may be made clearer by reference to Table 1 and the chapter's discussion of the concepts.

The general strategy dominating research procedures exploring for adequate conceptualization of innovation characteristics was to bring descriptions of the innovations and concepts from the literature on organizations in contact with each other. The analysis worked from a general familiarity with the data and the literature. A rough initial classification of concepts was drawn from the literature, and then progressively refined by exposing it to descriptions of the innovations uncovered in the data. One by one, each of the 574 innovations was compared with the evolving framework of concepts. When one or another

did not seem to fit, this was an occasion for a modification of the conceptual framework. Sometimes these modifications came easily. A concept which appropriately described the troublesome innovation's essential difference was obvious. At other times, adequate descriptive concepts were much more difficult to find. On these occasions, browsing through the indices of books on organizations often helped. Sometimes these musings lead to rereading of helpful passages. Several times these casual passes at the literature solved a different dilemma than the one immediately prompting them.

The data for the disaster organizations was examined by reading descriptions of innovations made by Anderson (1969) and Adams, Stallings and Vargo (1970). These descriptions saved an enormous amount of work which would have been expended examining the several hundred interviews upon which their descriptions are based. Next, the fifty-nine fire and sixty-two police interviews were reviewed for continued modification of the framework of concepts. Almost one-third of these interviews had been transcribed; the remainder were tape-recordings of the interviews. Information was vastly more accessible from transcribed interviews than from tapes.

The placement of the innovations within the emerging conceptual classification and the development of the complete framework required much more than one review of the data. A couple of drastic realignments and several refinements of the conceptual framework were made. Each of these required the reclassification and reinterpretation of all of the data. Some elements of the data were reviewed more than a half dozen times.

Review of the data started with elaborate, meticulously typed and reproduced forms for classifying and accumulating frequencies of different types of innovations. This form worked well for less time than it took to compose and reproduce it. Soon marginal notes recording innovations which did not quite fit overflowed their pages. These forms were replaced with newer, more tentative ones. These too passed, as several successive classifications had their useful moments.

The classification underwent several additions and subtractions in its concepts, but most changes were adjustments in the alignment and integration of the concepts. For example, earlier versions of the conceptual classification treated organizations changing domains, subunits, positions and roles as if they were separate dimensions. Much later it became clear that the latter three concepts referred to aspects of the organizational divisions of labor. Organizational domains now seemed a separate dimension with its own subclassification. Accordingly, analytical classification was changed and the data were again reviewed to see how well each innovation was descriptively captured.

An example of another major evolution is the adoption of a sub-classification under "standby-social" innovations almost identical with the one used for "routine social" changes. For almost the entire data analysis period I worked with a mental set which saw these standby social

mechanisms as crisis plans. I developed a number of unsatisfactory ways
of distinguishing between changes in plans before realizing the conceptual
framework developed for routine social features of organizations was
appropriate for standby social changes. After all, standby social
mechanisms are alternative social systems. Presumably, they could have
the same latent features of domain and divisions of labor. Another look
at the relevant data clearly showed the superiority of this principle
of classification.

And, so it went. The rudimentary procedures of adjusting a frame-
work of concepts to fit the study's data was the primary technique of
the study. Beyond this, standard computational techniques were used to
provide descriptive parameters such as percentages.

The most time consuming tasks of analysis were over once the con-
ceptual scheme was finalized and each innovation safely classified. From
this point procedures of analysis involved only comparing the patterns
of distribution and frequency of types of innovations in different social
contexts. The different populations of organizations were compared.
Then several other ways of grouping cases were attempted to match patterns
of organizational characteristics of innovations with social conditions
which may help explain the patterns. In this manner, hypothetical
explanations for innovation patterns are discarded or given plausibility.

Conclusions

This chapter has two points of departure -- the research tradition
and the literature on organizational change. It has described a
research strategy, methodology and techniques for the study. It was
argued that an exploratory and qualitative methodology promises the
greatest contribution to the research tradition and literature. This
research methodology can take advantage of available data of great
promise. The methodological stance of the study was further supported
by general arguments showing that adequate description and classification
of social phenomena is a prerequisite for hypotheses suitable for
verificational research. Finally, the three populations of data have
also been introduced and the research procedures for their analysis
have been described.

The next two chapters present analysis of these data. Chapter III
reports patterns in the organizational characteristics of innovations,
while Chapter IV presents promising hypotheses to explain these patterns.

1. It must be strongly stressed that the present review of the literature is designed to assess only its contributions to the initial steps of this study. The literature is reviewed at this point only for the assistance it provides in (1) sharpening the definition of the focus and objectives of the study and (2) providing the models of research procedure this study may follow. Obviously, these are not the only relationships which might be drawn between this study and the literature. However, here we are looking for assistance in deciding how to proceed. Later, when the results of the study are developed we can again view portions of the literature. Then, however, we will be questioning the bearing of this study upon the literature. These questions will be taken up in the conclusions of the study.

2. Other case studies of organizational change include Sheldon L. Messenger (1955); Mayor Zald and Patricia Denton (1963); David Sills (1957); Robert Guest (1962).

3. Other multiple comparative studies of organizational change include John Tsouderos (1955); James E. McNulty (1962); Jerald Hage and Michael Aiken (1967).

4. See for example, William J. Goode and Paul K. Hatt (1952). For the logic of verificational methodology see Hans L. Zetterberg (1965). For a discussion of an alternative methodological approach see Barney Glaser and Anselm Strauss (1965).

CHAPTER III

ORGANIZATIONAL CHARACTERISTICS OF INNOVATIONS

This chapter examines 574 innovations made by 103 organizations.
The organizations comprise three separate populations. Seventy-three
organizations from four cities which have experienced major natural
disasters are studies for innovations preparing for future disaster
responses. Sixteen fire departments are examined for innovations pre-
paring for responses to civil disturbances. Fourteen police departments
are studied for civil disturbance innovations. The chapter reports on
the first objective of this study: to discover and describe the
organizational characteristics of innovations anticipating crisis. It
examines the ways in which innovations change their organizations and
summarizes the overall patterns of innovation for each population of
organizations. To do so it introduces a "qualitative classification of
organizational characteristics of innovations." It uses the concepts
of this classification to organize the description and analysis of the
innovations from which it was derived.

The chapter begins with summaries of the innovations discovered in
each population of organizations. Next, three conceptual distinctions
which underlie analysis of the organizational characteristics of inno-
vations are introduced. These distinguish organizational from inter-
organizational changes; social from material-resource changes; and routine
from standby changes. The other concepts in the classification of
innovations are briefly introduced without discussion. The third section
presents the overall pattern of innovation characteristics in each set of
data. The fourth and largest section of the chapter describes the
innovations discovered by the study and clarifies further conceptual
distinctions used to analyze them. Concepts for the classification of
organizational innovations are introduced and defined while at the same
time the innovations classified by each concept are described. The
chapter concludes with a brief comparison of patterns of innovation
characteristics in each population. First, the innovations of each
population of organizations are briefly described.

Three Populations of Innovations

The innovations found in our three populations of organizations are
presented in tabular form. Here we label and classify the innovations
much as the organizational officials who reported them. Our purpose is
simply to introduce the entire range of innovations prior to classifying
them more technically according to their organizational characteristics.
Table 1 lists the types and frequencies of innovations in seventy-three
organizations following experience of response to natural disasters.

Table 2 records innovations for possible civil disturbances responses by sixteen fire departments. Table 3 does the same for fourteen police departments.

A Qualitative Classification of Organizational
Characteristics of Innovations

Three distinctions are most useful in classifying innovations, made in anticipation of crisis responses. These distinctions have been derived in view of the data of this study, and therefore, may be of limited general application. However, in light of the special nature of most of the changes, it is necessary to use conceptual distinctions which adequately describe the cases at hand. A set of concepts drawn from the literature without regard to the nature of the changes under study would not fit well with our data. The organizational literature tends to deal with major aspects of organizations and not such peripheral aspects as the innovations under study. A primary purpose of this study is to describe the organizational characteristics of innovations made in anticipation of crisis responses. Therefore, the concepts found useful for describing these innovations are an important aspect of the findings of the study. The data suggest three dichotomies: (1) The distinction between changes occuring only within single organizations and those which span two or more organizations. (2) The distinction between changes in organizations' social patterns and their material resources. (3) And, changes in everyday organizational routines as compared with changes in organizational standby measures.

Organizational and Interorganizational Innovations

Innovations in anticipation of crisis may occur both within and between organizations. That is, innovations may alter either the internal arrangements of organizations or their interorganizational relationships. This distinction is useful because interorganizational relationships may be changed without directly altering what goes on inside the organization and vice-versa. Response to crisis demands generates both organizational and interorganizational problems. It is of some interest to discover whether one or the other type of problem is more likely to be addressed by organizational innovation.

TABLE 1

INNOVATIONS IN FOUR CITIES FOLLOWING DISASTERS

Description of Innovation	Explosion City	Earthquake City	Hurricane City	Tornado City	Total
1. Written Disaster Operations Plan	8	2	5	4	19
2. Emergency Mobilization Plan	1	1	1	1	4
3. Written Interorganizational Plan (Two Organizations)	4	2	0	0	6
4. Written Interorganizational Plan (Three or More Organizations)	1	2	3	0	6
5. Plan for New Disaster Task	0	0	3	0	3
6. Plan for New Disaster Response Unit	0	0	2	1	3
7. Plan for New Disaster Role	0	0	2	0	2
8. Training: Organizational Drills	2	0	0	0	2
9. Training: Interorganizational Drills	1	0	1	0	2
10. Training: Disaster Response Skills	0	0	2	1	3
11. New Everyday Task	0	0	1	0	1
12. New Planning Activity	0	0	1	0	1

TABLE 1 (continued)

Description of Innovation	Explosion City	Earthquake City	Hurricane City	Tornado City	Total
13. New Organizational Position	0	3	1	0	4
14. New Routine Organizational Subunit	0	1	0	0	1
15. New Everyday Organizational Facilities	0	2	0	0	2
16. Auxiliary Personnel for Disaster Responses: Organizational	1	0	0	0	1
17. Auxiliary Personnel for Disaster Responses: Interorganizational	1	2	0	0	3
18. Disaster Supplies	3	0	1	0	4
19. Disaster Equipment	1	2	6	0	9
20. Auxiliary Generator	0	0	9	1	10
21. Communications Equipment	5	3	10	7	25
22. Interorganizational Communication Equipment (Two Organizations)	0	0	13	7	20
23. Interorganizational Communication Equipment (Three or More Organizations)	1	1	3	3	8

TABLE 1 (continued)

Description of Innovation	Explosion City	Earthquake City	Hurricane City	Tornado City	Total
24. Mobile Clinic	0	0	1	0	1
25. Canteen	0	1	0	0	1
26. Storm Observation Shelter	0	0	0	1	1
27. Shelter Facilities	0	0	1	1	2
28. Warning Equipment	0	0	0	1	1
Total	29	22	66	28	145
New Organizations	0	1	1	1	0

TABLE 2

INNOVATIONS IN SIXTEEN FIRE DEPARTMENTS FOR CIVIL DISTURBANCES

Features of Fire Departments	Depts. with Feature in 1970	Depts. Adopting Feature 1965-1971	Depts. Modifying Feature 1965-1971	Number of Innovating Departments	Number of Innovations
1. Written Civil Disturbance Plan	14	14	4	14	18
2. Task Force Operations Plan	13	12	4	11	16
3. Emergency Mobilization Plan	15	11	3	11	14
4. Policy for Fire Fighting in a Dangerous Situation	13	13	0	13	13
5. Bomb Specialist Task	1	1	0	1	1
6. Use of Firemen for Social Control	2	2	0	2	2
7. Use of Firemen for Security Tasks	2	2	0	2	2
8. False Alarm Procedures	11	9	3	9	12
9. Armed Guards on Fire Trucks	10	10	0	10	10
10. Written Mutual Aid Agreements with Other Fire Departments	12	5	3	7	8

TABLE 2 (continued)

Features of Fire Departments	Depts. with Feature in 1970	Depts. Adopting Feature 1965-1971	Depts. Modifying Feature 1965-1971	Number of Innovating Departments	Number of Innovations
11. Written Interorganizational Plan with Other Organizations	8	5	2	7	14
12. Recruit Civil Disturbance Training	3	5	0	5	5
13. In-Service Civil Disturbance Training	10	10	0	10	10
14. Protective and Safety Equipment	14	12	4	12	16
15. Emergency Operations Center	3	1	2	3	3
16. Mobile Communications Equipment	6	4	2	5	6
17. Reserve Firefighting Equipment	14	1	5	6	6
18. Riot Weapons	2	2	0	2	2
19. Auxiliary Firefighters	5	3	0	3	3
20. Community Relations Training	3	3	10	3	3
21. Community Relations Program	4+	5	0	5	5

TABLE 2 (continued)

Features of Fire Departments	Depts. with Feature in 1970	Depts. Adopting Feature 1965-1971	Depts. Modifying Feature 1965-1971	Number of Innovating Departments	Number of Innovations
22. Community Relations Unit	4	5	1	5	5
23. Community Service Projects	11	4	5	9	9
24. Minority Recruitment Projects	6	6	1	6	7
Total					187

+ One department adopted, then disbanded a community relations program and unit.

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TABLE 3

INNOVATIONS IN FOURTEEN POLICE DEPARTMENTS FOR CIVIL DISTURBANCES

Features of Police Departments	Depts. with Feature in 1970	Depts. Adopting Feature 1965-1971	Depts. Modifying Feature 1965-1971	Number of Innovating Departments	Number of Innovations
1. Written Civil Disturbance Plan	13	13	5	13	18
2. Emergency Call-up Plan	12	10	2	11	12
3. Mass Arrest Procedures	12	11	1	12	12
4. Policy for Response to Looting	8	8	0	8	8
5. Emergency Planning Task	7	5	2	7	7
6. Emergency Planning Unit	6	6	0	6	6
7. Written Agreement with National Guard	7	7	0	7	7
8. Written Plan with Other Law Enforcement Agencies	6	6	0	6	6
9. Written Plan with Fire Departments	6	6	0	6	6
10. Written Agreement with Mass Media	4	4	1	4	5
11. Other Written Interorganizational Plan	7	7	0	7	24

TABLE 3 (continued)

Features of Police Departments	Depts. with Feature in 1970	Depts. Adopting Feature 1965-1971	Depts. Modifying Feature 1965-1971	Number of Innovating Departments	Number of Innovations
12. Recruit Civil Disturbance Training	12	12	2	12	14
13. In-Service Civil Disturbance Training	13	13	1	13	14
14. Riot Control Equipment	13	13	1	13	14
15. Emergency Operations Center	6	6	0	6	6
16. Mobile Command and Communications Equipment	8	8	0	8	8
17. Auxiliary Police	3	2	1	3	3
18. Community Relations Training	12	12	1	12	13
19. Community Relations Program	12	12	0	12	12
20. Community Relations Unit	11	11	1	11	12
21. Rumor Control Programs	2	2	0	2	2
22. Minority Recruitment Program	9	9	0	2	2

TABLE 3 (continued)

Features of Police Departments	Depts. with Feature in 1970	Depts. Adopting Feature 1965-1971	Depts. Modifying Feature 1965-1971	Number of Innovating Departments	Number of Innovations
23. Racial Integration of Patrol Teams	*	2	2	3	3
24. Concentrating of Minority Policemen in Minority Neighborhoods	*	3	0	3	3
25. Regular Communication with "Militant" Minority Leaders and Organizations	8+	9	0	9	9
26. Regular Communication with Traditional Minority Leaders and Organizations	8	8	0	8	8
Total					242

* Figure not available.

+ One department adopted, then discontinued regular communication with militant groups.

Material-Resource and Social Innovations

From a sociological perspective organizations are patterns of
social relationships, social norms, and activities structured by them.
However, organizations do act within the context of physical setting and
do use technical implements. The social and technical aspects of organi-
zations are not independent. Social factors define and limit both the
purposes for which material resources are acquired and the circumstances
of their use. Likewise, limits of control and availability of material
resources can require adjustments of social features of organizations.
Despite this reciprocity of influence, it is useful to separate innova-
tions which change only the material resources of an organization and
those which change its social aspects. Because of its emphasis on social
aspects of organizations, a sociological study finds changes in social
norms or relationships of greater interest. Such changes alter the
social bases of organized activities. On the other hand, changes in
material resources may or may not affect social patterns. If they do, it
is indirectly. This emphasis of focus upon social patterns is the reason
for our distinction between changes in social features of organizations
and changes solely in material resources.[1]

Routine and Standby Innovations

When the topic of organizational change is addressed the implicit
reference is usually to alterations of routine, everyday aspects of
organizations. However, for the innovations presently under consideration,
this limitation of focus is not warranted. By the very unscheduled
nature of crises, organizational measures to cope with disasters and
civil disturbances are often not part of everyday organizational routines.
We call these nonroutine aspects of an organization's capacity to meet
crisis demands <u>standby mechanisms</u>. Any arrangements or preparations
designed to meet crisis demands which are not part of an organization's
routine structure and patterns of action are standby mechanisms. The
most obvious examples of standby mechanisms are organizational plans
which detail responsibilities and modes of operation in the event of a
crisis response. These plans are not part of the routine functioning
and social patterns of the organization. They represent social arrange-
ments and procedures to be assumed only in nonroutine contexts. Standby
mechanisms may be social when they specify norms and relationships which
are activated by crisis, or they may be material resources reserved for
use in crisis response. They may also be designed for either internal
organizational arrangements during response or for interorganizational
relationships.

The distinction between routine and standby innovations is
important. Standby mechanisms can be changed without altering the day-to-
day patterns of a social system. Although the importance of standby

mechanisms for the quality of disaster responses is not at question, as changes they do not alter organizations in the same way as changes in routine. In an exaggerated sense, changes in standby mechanisms are promises to react in a certain way _if_ the occasion of a crisis should arise. These promises can be made in many cases without challenging either the formal or informal structures of the organizations, a clear understanding of this distinction is necessary to assess the relative significance of the change in the organization as a social system.

Social innovations in organizational routines comprise what are usually identified as organizational changes. These are so-called structural changes, because they alter organizations as enduring social systems. In most discussions of organizational change routine social changes are the only ones examined. It is a commentary on the nature of the changes found in this study that we focus on other than routine social changes. The use of the concept of standby mechanisms reflects the special nature of the substantive topic under consideration. As far as social changes are concerned, the distinction between routine and standby changes is most important. It is a crucial dividing point which separates organizationally minor from organizationally significant innovations.

However, all innovations in organizational routines are not the same, nor are all standby innovations the same. Important differences are found among the innovations in both routine and standby social categories. Several further conceptual distinctions are necessary to adequately describe the similarities and differences among our innovations. Figure 1 lists all of the concepts of the full classification of innovations developed in this study. The new concepts it contains will not be defined at this point. Rather, they will be defined and illustrated with the innovations which occasioned their use in the classification system. Before describing the innovations and introducing the remaining concepts, however, the overall innovation pattern in each population of innovations is introduced.

General Patterns of Innovations in Three Populations of Organizations

Innovations are routine changes when they alter the day-to-day aspects of their organizations, that is, when they alter something enduring and repetitive. They are standby changes when they are operative only in disaster contexts. Routine changes alter the organization at the time they are implemented; standby changes alter organizational practices only if the special context of crisis is encountered. Social changes alter some aspect of the social norms and social relationships of an organization. That is, they change the social basis of coordinated organizational activities. Material resource changes directly alter only the physical implements of an organization. These two conceptual distinctions can be cross-classified to yield four types of innovations.

FIGURE 1

A QUALITATIVE CLASSIFICATION OF THE ORGANIZATIONAL CHARACTERISTICS OF INNOVATIONS

SOCIAL CHANGES

I. Changes in Organizational Routine

A. Organizational

   1. Organizational Domain
      a. Task
      b. Jurisdiction
      c. Procedures

   2. Division of Labor
      a. Organizational Subunit
      b. Position
      c. Role
      d. Status

   3. Membership

   4. Training (Socialization)

B. Interorganizational

II. Changes in Standby Social Mechanisms

A. Organizational

   1. Organizational Domain
      a. Task
      b. Jurisdiction
      c. Procedures

   2. Division of Labor
      a. Organizational Subunit
      b. Position
      c. Role
      d. Status

   3. Membership

B. Interorganizational

MATERIAL RESOURCE CHANGES

III. Routine Resources

A. Organizational

B. Interorganizational

IV. Standby Resources

A. Organizational

B. Interorganizational

Some innovations change <u>routine social</u> aspects of their organizations. <u>Standby social</u> innovations change social arrangements activated only for crisis. <u>Routine material-resource</u> innovations add new technological implements to an organization's day-to-day operations, while <u>standby material-resource</u> innovations add new implements for use only in the event of crisis. Tables 4,5, and 6 report the percentage and absolute distributions with these four types for the innovations of each population of organizations.

As Table 4 shows, of 145 innovations in 73 disaster organizations, only about 10 percent (14) changed routine social aspects of their organizations. The remaining 90 percent (131) of the innovations are either confined to resource changes or are operative only in the event of a future disaster. The overall pattern is one of little change in organizations as ongoing social systems. Most of the observed innovations are but minor adjustments relative to the ongoing activities or organizations. This tendency becomes even more clear in the next section when the nature of the innovations is examined more closely.

As shown in Table 5, innovations in social routines are more common among fire departments anticipating civil disturbances. Almost 30 percent (52) of 187 innovations observed are of this type. Table 6 shows that routine social innovations are more significant as organizational changes. The greater proportion of routine social innovations found among fire departments, and especially police departments, defines another piece for our puzzle. Why do the routine social innovations -- those most significant in the degree to which they alter their organizations as social systems -- occur in sharply different proportions among our three populations of organizations? What factors differentiate these populations in ways which suggest hypotheses to explain this pattern? We shall return to this question in the next chapter. First, however, we examine more completely the nature of our three populations of innovations and the concepts necessary to describe their organizational characteristics.

<u>Specific Types of Innovations</u>:
<u>Concepts and Description</u>

Social Changes

Social changes have the potential for being significant alternatives of their organizations. From a sociological perspective social innovations change the essence of organizations -- the social norms and relationships which predicate enduring patterns of social action. Over 73 percent (432) of our 574 innovations are social changes. Over 43 percent (248) changed standby social mechanisms and about 31 percent (184) altered social routines. These routine social innovations are the most extensive organizational consequences of anticipation of crisis.

TABLE 4

PERCENTAGES OF ORGANIZATIONAL CHARACTERISTICS OF INNOVATIONS
IN SEVENTY-THREE ORGANIZATIONS FOLLOWING DISASTER (N= 145)[+]

	Routine Changes	Standby Changes	Total
Social Changes	9.7 (14)	32.4 (47)	42.1 (61)
Material Resource Changes	1.4 (2)	56.6 (82)	57.9 (84)
Total	11.0 (16)	89.0 (129)	100.0 (145)

[+] The 145 innovations do not include three entirely new organizations.

TABLE 5

PERCENTAGES OF ORGANIZATIONAL CHARACTERISTICS OF INNOVATIONS
IN SIXTEEN FIRE DEPARTMENTS (N = 187)

	Routine Changes	Standby Changes	Total
Social Changes	29.9 (56)	52.9 (99)	82.9 (155)
Material Resource Changes	2.1 (4)	15.0 (28)	17.1 (32)
Total	32.1 (60)	67.9 (127)	100.0 (187)

TABLE 6

PERCENTAGES OF ORGANIZATIONAL CHARACTERISTICS OF INNOVATIONS
IN FOURTEEN POLICE DEPARTMENTS (N = 242)

	Routine Changes	Standby Changes	Total
Social Changes	47.1 (114)	42.1 (102)	89.3 (216)
Material Resource Changes	0	10.7 (26)	10.7 (26)
Total	47.1 (114)	52.8 (128)	100.0 (242)

Routine Social Changes

Routine social changes are much more clearly captured by usual conceptions of organizational change than standby and material resources changes. Of the 184 routine social innovations observed fourteen are found among disaster organizations, fifty-six among fire departments and 114 occur in police departments. The mean number of routine social innovations by disaster organizations is .19; fire departments average 3.5 per organization, and police have 8.1 routine social innovations each.

There is a wide range among the 184 innovations in social routines. They capture their organizations in many distinct ways. Additional conceptual dimensions must be introduced to adequately describe important differences among them. Concepts useful for this purpose must first accomodate the actual innovations found in the study, and, second, they must reflect a conception of important dimensions of organizations. These criteria are not entirely consistent. Compromises are necessary to reasonably meet both. The tensions between them preclude a classification scheme of simple logical elegance on one hand and concepts which completely describe each innovation on the other hand.

A compromise between these two desirable objectives is made by relying on a sociological conception of organizations. As each innovation was examined, this question was asked: How does this innovation change its organization as an organization? Ultimately, the conceptual distinctions are derived both from attempts to describe each innovation adequately and to express its organizational nature as part of a succint classification.

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"Organizational domain" and "division of labor," two concepts central to a sociological view of organizations, are used to organize most of the additional organizational characteristics of innovations. Organizational domains[2] are normative definitions specifying: (1) the problems for which an organization is responsible -- its tasks; (2) the circumstances under which it is permissible (or necessary) for an organization to address these problems -- its jurisdiction; and (3) the human behavior appropriate and legitimate for meeting these problems -- its activities (or procedures). An organization's domain consists of what it is supposed to do, when and where this is to be done, and how it goes about doing it. Organizations have members who, among other actions, are engaged with fulfilling the tasks of organizational domain.

TABLE 7

SOCIAL CHANGES IN ORGANIZATIONAL ROUTINES

	Disaster (N_d=145)	Fire (N_f=187)	Police (N_p=242)	Total
Organizational	(12)	(44)	(100)	(156)
Organizational Domain	(1)	(13)	(24)	(38)
Task	1	13	24	38
Jurisdiction	0	0	0	0
Procedures	0	0	0	0
Division of Labor	(6)	(6)	(23)	(35)
Organizational Subunit	1	5	17	23
Position	4	1	0	5
Role	1	0	0	1
Status	0	0	6	6
Membership	0	7	12	19
Training	5	18	41	64
Interorganizational	2	8	17	27
Total	14	56	114	184

But all members are not engaged in the same ways to meet an organization's problems. Instead, members concentrate on different, but complementary, activities which taken together contribute to accomplishing the organization's tasks. Thus, there is a division of labor which may be changed independently of changing any aspect of an organizational domain. Looked at from one point of view an organization's division of labor divides it into a number of distinct positions, that is, niches to be occupied by individual members. Looked at another way it divides an organization into various subunits or groups of positions differentiated by space, time, and function. Finally, the division of labor can be viewed as differentiating an organization into analytically separable roles or differentiated sets of normatively prescribed activities to guide the behavior of the incumbents of given positions. Again, as in the case of the elements of organizational domain, subunits, positions and roles each may change independently.

The concepts subsumed under organizational domain and division of labor provide analytical tools for describing the social norms which guide behavior and the social relationships which organize it. This broad net captures most, but not all, of the innovations in social routines found in this study. Three other categories must be appended. These are changes in organizational status structures, membership, and member socialization. Every organization stratifies its members along many dimensions. The individual attributes according to which people are stratified are social statuses and the overall pattern of stratification of statuses is a status system. The most obvious attribute along which members are stratified is authority.

However, authority is not the only attribute which can be stratified-- so can wealth, educational attainment, and any other distinctive human attribute (real or imagined) which is distributed unequally among organizational members. In this study we are interested only in the inter- section of status distinctions with the division of labor. The specific examples (to be discussed later) which occasioned the inclusion of status as a concept in our classification of changes was the differentiation of people with Negro racial status into designated slots in the existing position and role structures of the organization.

Change in organizational membership does not refer to merely the absence of former members or the presence of new ones. It refers to changes in the criteria used for selecting from among potential members, and, more often, to activities initiated to attract special sorts of new members. Finally, changes in member socialization simply refer to alterations in the content of existing organizational training programs or the initiation of new training programs. For simplicity these will be designated training changes.

Changes in Organizational Domain

The concepts used as components of organizational domains are all defined in terms of shared normative definitions. As in the case of any concept which indicates some consensus over shared definitions, these concepts are extremely difficult to develop adequate data about. It is impossible to ask all the relevant people within and outside an organization what they think the tasks, jurisdiction, and activities of an organization should be. It is also impossible to gather this information at several points in time for 103 organizations. Thus, an important conceptual restriction is placed on all the concepts used as components of organizational domains. We shall treat organizational tasks, jurisdictions, and activities as formal properties of organizations, known, maintained, and changed by the administrative officials of each organization.

Thus, when we speak of change in any aspect of organizational domains we are reporting changes in formal organizational norms as identified by officials with the authority to maintain and change these norms. This conception changes methodological impossibility into possibility, but it also changes the meaning of the concepts slightly. People in other positions in the organization and in crucial positions in the organization's environment may see a domain differently from formal prescriptions and might report different perceptions of change. Our present focus is restricted to formal norms and authoritatively recognized formal changes in them.

Routine Task Changes

Only one routine task change, a boat rescue squad added to the Hurricane City fire department, was found in the four disaster cities studied. Fire departments reported undertaking thirteen innovations which added new routine tasks in anticipation of possible civil disturbances. Police departments made twenty-four such formal innovations. In both police and fire departments the majority of new tasks assumed were directly in response to the threat of hostility from disaffected minorities during civil disturbances. Ten task innovations by fire departments were the initiation or drastic expansion of community service programs. These are programs in which fire departments take on civic-minded projects, for example, raising money for disadvantaged children or using their equipment to help control insect pests. The other five fire department routine tasks innovations were community relations programs adopted for similar purposes. The objectives of both community relations programs and community service projects are to enhance fire department relations with minority communities, the source of potential adversaries in civil disturbances. (Included in this number is one department which adopted a community relations program and then disbanded it about one year later.)

Of the twenty-four changes in routine organizational tasks by police departments, twelve are community relations programs. During civil disturbances police face very serious problems exercising control over large numbers of people. The political sensitivity of applying stringent social control measures to activities which many interpreted as protest, and the difficulty of accomplishing outright control over civil disturbances made police receptive to programs which took reduction of hostility between minorities and police as their goal. In every case the community relations programs represented new tasks added to the police domains for the first time.

Of course, police made innovations in keeping with their traditional social control functions too. Ten of the innovations in routine tasks which were observed were adoption or several-fold expansion of routine, continuing planning programs. Previously, planning for crises had been of only intermittant concern or not pursued at all. Civil disturbances presented such difficult and delicate problems of police response that many departments felt preparations for them should be part of everyday tasks. Finally,two police departments adopted new rumor control tasks. Many communities initiated rumor control programs which sought to reduce the contribution of untrue rumors to precipitation of civil disturbances, to provide information to citizens, and to accept complaints related to minority grievances. In most communities these tasks were carried on outside police departments, but in two cases in our population, police departments took on rumor control tasks themselves.

There are no further changes in routine organizational domains reported as innovations. The organizations under study did not basically change the sorts of problems they addressed with their day-to-day activities. Police and fire departments adopted new community relations tasks in order to neutralize threats perceived from minorities within their communities. Thus, community relations tasks can be viewed as attempts to control crisis agents. Community relations tasks were assumed in efforts to head off crisis or mitigate its intensity. Adoption of planning tasks by police departments are interesting, because they made preparation for unpredictable, non-routine events part of the routine activities of the organization. Disaster organizations assumed no new routine tasks, nor did they alter routine organization domains in other ways. For most organizations disaster responsibilities were inescapable, but they were so tangential to routine organizational domains that they became remote day-to-day concerns. The few organizations, such as civil defense agencies, which were routinely concerned with the possibilities of disaster responses had planning tasks as part of their pre-disaster domains, so no change in tasks occurred.

Changes in Routine Division of Labor

The work of organizations is divided among various subunits at one level of analysis, among various positions at a second, and among a variety of roles at a third. Innovations which change any of those

aspects of their organization's division of labor add to its structural complexity. The growth of organizational complexity generally is seen as a result of changes in size or of attempts to rationalize organizational processes through specialization. The few changes in divisions of labor our data affords fall in the latter category. Divisions of labor were changed to provide organizational locations for concentration upon new organizational tasks or old tasks which suddenly seemed more crucial. Disaster innovations included only one new routine subunit, four new routine positions and one new role relationship. Fire innovations include five new routine subunits and one new position. Police innovations continued to show much greater tendency toward changes in organizational routines with seventeen new subunits. Six police innovations also introduced new status distinctions into their divisions of labor.

The new routine subunit and three of the new positions added by disaster innovations occur in one small organization -- a state civil defense agency. This agency, which had always had disaster planning responsibilities, radically upgraded these tasks by creating a new subunit to concentrate on them and by adding an "assistant director for disaster operations" and two other new positions. The other two disaster innovations which altered divisions of labor occurred in another civil defense organization. A local civil defense agency added an engineer to its staff and changed the role relationship between disaster planning and training officers so that they routinely worked much more closely together.

Fire and police innovations affecting divisions of labor generally accompanied the addition or upgrading of community relations tasks. The five subunits added to routine fire organization structures were all community relations units and the one new position was a community relations specialist. Police innovations included eleven new community relations units and six new planning units. Police innovations also included six changes classified as making new status distinctions operative in the division of labor. This designation is given to three changes which concentrated minority officers in minority neighborhoods and three changes which initiated or modified racially integrated patrol teams. These innovations are classified as the introduction of new status distinctions into the division of labor, because they add a new dimension to the set of status distinctions (such as experience, rank, education, and special skills) used in apportioning work in the organization. Admittedly, this was most likely a formalization of informal status distinctions which were previously made anyway. These status changes are innovations in the sense of making race a formally designated status characteristic specifically suitable for occupying certain positions in the organization.

Changes in Training and Membership

Seven fire innovations and twelve police innovations are changes designed to alter the composition of organizational membership. Six fire innovations initiated special minority recruitment programs while one modified and strengthened an existing program. Ten police innovations initiated minority recruitment programs for the first time and two strengthened them. The objectives of these alterations in composition of membership were very similar to the community relations efforts discussed above. They were measures intended to improve the relationship of police and fire organizations with minority peoples. The classification of these special recruitment efforts as routine changes deserves qualification. These are episodic changes. Even though they take place as an addition to organizational routines, they are only briefly or intermittently operative. They are not structural additions to organizational routines in the same sense as new tasks or new subunits. They can, however, have lasting impact on the composition of membership if they successfully recruit minority members. The success of these recruitment programs was not generally reported as great.

Four disaster innovations, eighteen from fire and forty-one from police initiated or altered organizational training for crises. Three other disaster innovations altered interorganizational training programs. All but two of the disaster training program changes take the form of periodic drills simulating some anticipated disaster activities. The remaining two are short courses of instruction on specific disaster skills. For example, one of the interorganizational innovations in training occurred when a local Red Cross chapter gave fire department personnel training in first aid in conjunction with the designation of fire stations as first aid locations in disasters. The eighteen fire innovations in training include three adoptions of community relations training programs. The other fourteen fire innovations are training for civil disturbances responses, including adoption of ten in-service training programs and four recruit training programs. The forty-one police training changes include twelve adoptions and one modification of community relations training, thirteen adoptions and one modification of recruit riot training.

Membership and training innovations have special qualities which set them apart from other routine innovations and lessen their impact upon day-to-day organizational activities. Membership recruitment and training programs are episodic and only intermittently operating. Training program innovations change only the normal content of socialization programs without directly altering the structure of even the segment of the organizations giving the training. These innovations, even though changing regular and therefore routine aspects of organizations are not of the organizational magnitude of changes in domains or divisions of labor, because they do not directly alter central structures and processes of their organizations. It is beyond the scope of the data of this study to confirm or deny that their ultimate indirect effects

are more profound, although this possibility exists. For example, a community relations training program, if successful, might alter the behavior-guiding role conceptions of police officers in interaction with minority group members.

Interorganizational Changes. Finally, our routine innovations include twenty-nine routine social innovations which changed interorganizational relations. Four of these are disaster innovations, three of which are the interorganizational training innovations mentioned above. The other disaster innovation was an arrangement whereby a local Red Cross chapter paid insurance premiums on individually owned boats which were donated for use in a newly organized boat rescue squad within a fire department. The seventeen police innovations again fall into the area of attempting to control relations with minority groups. Eight innovations initiated new efforts to establish and maintain interaction with traditional minority organizations. Nine did the same for "militant" minority organizations. (Although, one of these nine was discontinued.) These were attempts on the part of the police to reach minorities through their organized interest groups. They share a great deal in philosophy and objectives with community relations programs.

The final eight interorganizational innovations in social routines are mutual aid agreements among fire departments. In the past, major city fire departments did not welcome mutual aid pacts with smaller suburban departments, thinking that the smaller departments would often need assistance from the massive capabilities of major departments while having nothing to offer which the larger departments could use. The excessive demands for fire suppression in civil disturbances led to a different view of mutual aid agreements. Major departments can now envision the circumstances in which their resources would be depleted and the smaller surrounding departments would have something to offer which they would need. Thus, five innovations initiated written mutual aid agreements with other fire departments and three modified them.

New Organizations. In addition to the fourteen routine changes in existing organizations, three innovations in disaster communities created new organizations specifically to improve responses to future disasters. One emergent organization grew out of the hurricane city's master mutual aid plans (discussed below). The coordination and complexity of developing this standby plan were such that a routine organization comprised of representatives of the several organizations was created. This organization meets regularly to address problems of preparedness in general and the status of the mutual aid plans in particular. A second emergent organization developed in the tornado city more than a year following the disaster. Its functions and routine activities are similar to the previous example. Its emergence was occasioned by the realization of the minor impact the tornado experience had had upon local preparedness. Concerned representatives of several local disaster-relevant organizations formed a Disaster Advisory Committee which meets regularly to assess and improve disaster preparedness. The final emergent organization is slightly different. In the earthquake city a new Civil

Defense Advisory Board was formed as part of the city government. Its duties are to oversee and advise upon the disaster preparations of local civil defense and city agencies.

In a certain sense these innovations are organizations in name only. As in the case of other routine social changes already discussed, they are only intermittantly operative. They appear to be more like multiple interorganizational relationships with regularized norms governing the frequency and content of interactions. As compared with more usual patterns of complex organizations, they do not have a daily implementation of activities. Their members appear to be defined and recruited solely on the basis of their positions in existing disaster-relevant organizations. The new organizations are likely to be meeting places of interests and concerns of other organizations rather than of their own unique interests and domain.

Conclusions. Our data indicates 184 innovations in organizational social routines. It is among these innovations that major organizational changes must be found. Changes in routine social structures and processes of organizations alter them as ongoing social systems. It is this type of change which is most significant from a sociological standpoint. However, changes may be greater or less even within this classification, and, on the whole, our data indicates these changes are relatively minor. For example, we have just noted that training and membership recruitment innovations are not of great direct impact on social structures of organizations, and they comprise over one-third (63) of the innovations in social routines.

Almost all of the remaining innovations were police and fire innovations in the area of community relations, including community relations programs, community relations subunits, and establishing interorganizational relationships with minority organizations. Further information is necessary to establish whether these are major or minor changes. Our data indicate most are minor. In the first place, their scope was small. Community relations units in fire departments sometimes amounted to only one person out of total organizational memberships of several hundred in communities of several hundred thousand. In fact, one fire community relations program was discontinued at the request of the single fireman running the program. Its success in attracting requests for his services far outstripped his ability to fulfill them.

The situation is not much different for police departments. Community relations units are small. As few as five men in an organization of 800 is not atypical. Furthermore, the programs are highly segregated from other more traditional activities within police organizations. In their present scope and form, these innovations are just not drastic changes in the social systems of the organizations under study. To the extent that police community relations programs introduced new organizational tasks, new elements in the division of labor, new interorganizational relationships, and new ideological view points alongside traditional police practices and beliefs, they are of greatest potential

for long term impact upon their organizations. However, that impact is presently only a potential not an actuality.

Therefore, we must conclude that in the area where the greatest direct impact upon organizations as social systems could have taken place-- among the routine social innovations -- it did not. Again, a general theme must be emphasized. These innovations were for problems marginal to traditional organizational domains. Despite the severe potential for disruption by natural disasters and civil disturbances, the general pattern observed is for even routine social changes to be minor in scope when compared with the overall magnitude of the organizations in which they took place. However, this overall pattern should not obscure the clear contrast which exists in the number and magnitude of changes in each population of organizations we study. Routine social changes are practically nonexistent among the natural disaster organizations studied. Only fourteen routine standby innovations are apportioned among seventy- three disaster organizations, for a mean of .19 per organization. For the civil disturbance populations the mean numbers of routine social innovations per organization are higher. Our sixteen fire departments average 3.5 routine social innovations each, while the fourteen police departments lead the way with 8.1 innovations each. Thus, two problems for explanation emerge from our inspection of routine social innovations in three populations of crisis-relevant organizations. First, one must ask why so few substantial changes were found among these organizations. And, second, we should try to explain the variations in frequency of such changes from population to population.

Changes in Standby Social Mechanisms

The class of "standby social innovations" captures changes in planned social arrangements for crises responses. Two hundred forty- seven of the 574 innovations of this study are changes in standby social mechanisms. Over 32 percent (47 of 145) of disaster innovations are of this type. Over 52 percent (98 of 187) of fire innovations change plans for crises social arrangements. For police innovations about 42 percent (102 of 242) are changes in standby social mechanisms. The seventy- three disaster organizations have a mean of .64 standby-mechanism changes apiece. The sixteen fire departments average 6.1 per organization, while fourteen police average 7.3.

Standby social mechanisms may specify an organization's pattern of mobilization for crisis, its mode of operation, its responsibilities, and its interrelations with other responding organizations. A complete set of standby social mechanisms for crisis response would be an alternative social system designed to guide organizational behavior in the special context of crisis. It would specify social norms and relationships to replace these routine social features no longer appropriate in a non- routine context. Thus, the concepts necessary to describe and classify

innovations in standby social mechanisms almost exactly parallel those appropriate for routine social innovations. As applied to routine social structures they describe an ongoing social system. As applied to standby social mechanisms they describe a <u>latent social system</u> planned for activation in a special context.

As depicted in Table 8, changes in standby social mechanisms will be described with the concepts of tasks, jurisdiction, and procedures as components of standby organizational domain. Standby divisions of labor will be described with the components of standby subunits, positions, and roles. The incorporation of status distinctions into the division of labor will also be described. While the descriptive category of membership will be included as for organizational routines, the category of training innovations has no counterpart among standby social mechanisms. Finally, the distinction between organizational and interorganizational levels of innovation is again made.

Changes in Standby Organizational Domains

One hundred thirty-eight (55.7 percent) of the 248 innovations in standby social mechanisms change standby organizational domains. Only nine of these change standby tasks, thirteen change standby organizational jurisdictions, and the remaining 116 (46.7 percent of all standby changes) alter defined procedures (activities) for crisis response.

Three changes in standby organizational tasks occur in the disaster innovations. All are found in the same organization, the fire department in Hurricane City. This city had experience in coping with disaster impact but in the disaster preceding the collection of data for this study, it had experienced a dual disaster -- impact first by hurricane (for which they were prepared) and then, unexpectedly, impact by flooding. The flood presented a different set of demands and highlighted new problems. The additional standby tasks now planned for the fire department cover these newly experienced demands. The community was without power for an extended time; now if the occasion demands, the fire department will distribute dry ice to preserve food until power is restored. The flooding presented problems of rescuing those stranded; the department now has standby boat rescue tasks. Also the department now has first aid responsibilities during disaster.

Fire departments also dominated the standby task changes among civil disturbance innovations. They made five, while police made none. Civil disturbances are massive social control problems. This accounts for the lack of additional standby tasks for police anticipating civil disturbances. They have too much to do already. This same fact also helps account for four of the new standby tasks adopted by fire departments. Two of these are the planned use of armed firemen for security tasks; the other two are the planned use of fire departments for social

TABLE 8

CHANGES IN STANDBY SOCIAL MECHANISMS

	Disaster $(N_d=145)$	Fire $(N_f= 187)$	Police $(N_p=242)$	Total
Organizational	(31)	(64)	(54)	(149)
Organizational Domain	(26)	(58)	(51)	(135)
Task	3	5	0	8
Jurisdiction	0	13	0	13
Procedures	23	40	51	114
Division of Labor	(4)	(3)	(0)	(7)
Organizational Subunit	2	2	0	4
Position	1	0	0	1
Role	1	1	0	2
Status	0	0	0	0
Membership	1	3	3	7
Interorganizational	(16)	(35)	(48)	(99)
Dual	10	35	48	93
Multiple	6	0	0	6
Total	47	99	102	248

control of civil disturbance participants. Neither of these innovations were popular among the fire officers interviewed. The general view was that these were inappropriate departures from the legitimate tasks of firefighters. The fifth new standby task adopted by a fire department is bomb security function. This was a rare innovation not even mentioned as a potential problem in other departments. All thirteen changes in standby organizational jurisdictions are found among fire innovations. They all are policies which restrict the responsibilities of fire departments to operate in dangerous situations which may accompany civil disturbances. In these special circumstances fire departments are no longer obliged to respond to all fires within a geographic area.

The remaining 116 innovations altering standby domains have been classified as changes in procedures (or activities) designed to implement the crisis objectives defined by standby tasks within the limits imposed by standby jurisdictions. Twenty-three disaster innovations for fire innovations and fifty-one police innovations are of this type. Essentially, these are organizational plans for disaster and civil disturbance. The disaster innovations in standby procedures are divided into two types. Operations plans specify actual procedures for meeting crisis tasks. Mobilization plans specify procedures for transition from routine to standby operations, such as call-up of personnel. Nineteen disaster innovations are operations plans and four are mobilization plans. There is variation in scope and detail of the plans, but all are formal, written plans. Among the more minor innovations classified as standby operations plans was one which outlined "guidelines" for a coroner's staff. Most of these plans were more detailed and extensive. These divided the disaster responsibilities of an organization into several complementary tasks which were selectively assigned to different subunits of the organization. Such more detailed operations plans were developed in several organizations, including Red Cross chapters, hospitals, local civil defense agencies, a city health department, two school systems, and a publicly owned utility. In one civil defense agency the direct affect of organizational learning in disaster upon operations plans was very clear. In this organization the innovation in plans adopted an emergency operations structure and procedures which had emerged during its response to the hurricane and flood. The organizational arrangements developed during disaster response had worked well enough to be formalized as plans for subsequent disasters.

Changes in standby procedures are divided three ways for fire innovations. Fire department plans for civil disturbance responses include operations and mobilization plans just like the disaster organizations. The third type of innovation counted is "task force operations" plans. Actually, these innovations could be classified with operations plans but the data indicate that the task force concept is important enough to be thought of and adopted separately. Twelve changes in standby procedures appear among the fire innovations, along with seventeen written plans and eleven mobilization plans. All of the task

force and mobilization plan innovations are initial adoptions, but four of the seventeen written plans are revisions of existing civil disturbance plans.

The fifty-one standby procedures changes made by police departments are divided four ways. Just as fire and disaster organizations, police departments made changes in operations and mobilization plans. They made eighteen changes in written plans for civil disturbances, fourteen initial adoptions and four modifications. They made twelve changes in mobilization plans, eleven adoptions and one modification.

A third standby procedures innovation is the statement of a formal policy for police response to looters in civil disturbances. This was a sensitive problem in many civil disturbances with some factions expressing the view that looting should be dealt with more harshly than simple breaking and entering and others feeling it should be less severely responded to by police officers. The policies vary. Some reaffirm the legal right of police to use their discretion in applying any force necessary to apprehend a felon. Others stipulate weapons are not to be used unless for the safety of the policeman or a third party. There are eight innovations formulating police department policies for response to looters.

A fourth standby procedures change by police departments is the development of written mass arrest procedures. Police arrests involve a great amount of paper work and other procedures. Partly, these are occasioned by the necessity to conform to arrest practices which will be admissible in court. Obviously, when very large numbers are arrested for curfew violations and other civil disturbance related crimes, processing of arrestees becomes a serious problem. Police officers cannot return to precinct offices or to centrally located jails to process and turn over arrestees. Police departments cannot dispense with the paper work and procedures without jeopardizing success in prosecution. Therefore, detailed plans were developed for implementation in mass arrest situations. Thirteen police innovations were mass arrest procedures. Of these, ten were newly adopted and three were notifications.

Changes in Standby Division of Labor

Sometimes in specifying their crisis tasks, organizations do not find convenient units in the division of labor to which to assign them. They may see the need for a group of people, a social position or a specialized role to attend to a certain problem otherwise not well covered or organized. This recognition may lead to an innovation affecting the organization's standby division of labor. A new standby subunit may transfer people from many locations in routine organizational structures to a new organizational location in the latent standby structure. These latent social units are to be activated in the event.

of crisis. Disaster innovations include plans for two new standby subunits. The fire department assuming the new standby task of boat rescue also plans for a new standby boat rescue squad. In another city, the local Red Cross chapter organized a standby unit called a "disaster readiness team" to specialize in response to initial problems immediately after disaster. Among civil disturbance organizations, fire innovations include two standby subunits. One is a bomb squad and the other is a security squad for protection of vulnerable fire installations. Police innovations do not include any standby subunits.

On other occasions an entire new standby subunit may not be needed and designation of a new standby position will suffice. Only one disaster innovation added a standby position for a utilities company which designated a liaison to local civil defense in future disasters. Two new specialized standby roles were found. In the Hurricane City fire department, new specialized first-aid skills were learned to fulfill the newly planned tasks of first-aid centers. Among the fire innovations for civil disturbance, one department developed the specialized role for security guards. As will be more fully discussed below, many departments had plans for armed guards to ride on their trucks during civil disturbance responses, but all the rest relied on other organizations to supply the guards. This single fire department trained its own members in the specialized standby role of guarding its apparatus and men during civil disturbances. The other departments studied explained they would rather rely on police or National Guard to perform guard duties, because they felt arming firefighters was outside fire departments legitimate responsibilities and it also tended to define firefighters as combatants.

Changes in Standby Membership

Sometimes the membership of an organization changes between its routine and crisis operations. This is most dramatic in civil defense agencies and local Red Cross chapters which expand from small predisaster groups to rather large organizations to carry out their suddenly expanded responsibilities. Organizations can plan for such changes in membership. Eleven innovations change organizational arrangements for standby memberships. Five of these are disaster innovations. One local Red Cross chapter recruited and trained additional volunteer personnel to back up present staff members during disaster. The other four disaster arrangements for additional standby personnel are interorganizational agreements and will be described in the next section. Both fire and police innovations include three additions of auxiliary personnel for civil disturbance responses.[3]

Standby Interorganizational Changes

Standby social mechanisms can be planned for relationships between organizations as well. Both disaster and civil disturbance innovations include standby interorganizational relationships designed to facilitate response to crisis.[4] The disaster innovations contain sixteen standby

interorganizational changes. Ten are dual, involving only two organi-
zations, and the remaining six are multiple, linking three or more
organizations.

Without exception, the dual interorganizational innovations are
volunteer standby agreements. This term is introduced to indicate
arrangements whereby one organization agrees to supply another with some
vital crisis assistance. Typically, the organization which is to be
assisted is one of the more crucial crisis-relevant organizations of the
community. The assisting organization is one with some resource or
capability which can facilitate the other's response. For example, we
find the police department in the earthquake city turning to Veterans
of Foreign Wars and American Legion groups as organized sources of
auxiliary police. A coroner's office reached an agreement with the
county physicians' association for provision of volunteer deputy
coroners in mass casualty situations.

A Red Cross chapter achieved a volunteer standby agreement with
the local telephone company for use of its radio-dispatched vehicles
during disaster. A civil defense agency has an agreement with a
citizen's band radio club for communications assistance. Another civil
defense agency has an agreement with a telephone company for immediate
automatic installation of additional telephones in future disasters.
A second police department has arranged for assistance from a radio
station in mobilizing its men. A nearby nursing home has agreed to
provide bed space to a major hospital in mass casualty situations. A
Red Cross agency has recruited a radio club for communications
assistance. All of these innovations consist of a promise of one
organization to aid the important disaster activities of
another. These are innovations which change neither of the organizations
involved, except to provide a definite disaster responsibility for the
volunteering organizations and to augment the disaster capabilities of
the receiving organization without sacrifice.

The six multiple standby interorganizational innovations follow
this pattern of volunteer standby relationships closely. One involved
only three organizations. It was an agreement among a local newspaper,
a ham radio group, and the Associated Press for communication of news
dispatches to AP when other communications are impossible. The other
extreme numerically was an agreement of twenty-two trucking companies to
provide disaster transportation to a civil defense agency. Another
involving almost as many organizations was an increase in the number of
Red Cross shelters in one community. About twenty organizations agreed
to provide their structures and a "cadre" of their personnel as
designated Red Cross shelters and shelter personnel. Within this
numerical range, was an agreement of a ham radio club and several
hospitals to rpovide inter-hospital communications during disaster. The
most extensive multiple standby interorganizational innovation was a
"master mutual aid" agreement among several organizations in Hurricane
City. The intricacies of standby social arrangements ordered by this
innovation became extreme enough to elicit the emergence of a new

routine organization to develop and maintain preparations for interorganizational relationships during disaster.

Fire innovations include thirty-five changes in standby inter-organizational relations. Twelve innovations establishing procedures for screening of false alarms in civil disturbances are interorganizational changes because they arrange for police to check box alarm calls before fire departments respond. Nine of ten innovations which placed armed guards on fire trucks are interorganizational, because police or National Guard are to supply the guards. There are fourteen written interorganizational plans with other organizations, including utilities, caterers for food service and several others. Forty-eight police innovations are written interorganizational standby changes. Seven are adoptions of agreements with National Guard organizations. Six are with other law enforcement agencies. Four adopt and one modifies written agreements with mass media outlets. These agreements generally restrict early reporting of civil disturbance type incidents because of the belief that such reports attract other potential participants to the area in difficulty. Six are written agreements with fire departments and the remaining twenty-four are scattered among other local organizations.

Conclusions

Among the 257 changes in standby social mechanisms recorded in three populations of organizations, two types predominate. First, standby procedures are changed 114 times by new crisis response plans. Other organizational-level standby innovations are relatively rare. This is especially true for police departments with no changes in standby tasks and jurisdictions. The police were obliged to respond to civil disturbances. There was no viable way they could restrict their standby domains as thirteen fire departments did. Their existing standby tasks were so demanding that it is not surprising they have not adopted ones. Fire departments could restrict their jurisdictions to reduce danger to firemen. Unlike police, they were generally defenseless noncombatants in the face of attacks. They also have no backup organization (such as the police have in the National Guard) should their equipment be damaged or their men injured. Overall, changes in standby divisions of labor are rare.[5] The second frequent pattern of standby social innovations is ninety-nine interorganizational changes. Many of these are "volunteer standby" relationships where one organization promises to provide some crucial assistance to another. Disaster interorganizational relationships are of this type as are many of those among fire innovations. Police standby interorganizational innovations include this type also. Especially, agreements with National Guard organizations are crucial supports for police. Thus, standby interorganizational innovations are concentrated on new plans outlining crisis procedures and new interorganizational agreements in the three populations of organizations studied here.

Changes in Material Resources

Patterns of material resource innovations in our three populations show both similarities and differences. These changes in technological implements predominate in disaster organizations, accounting for 58.2 percent (85 of 145) of their innovations. They comprise a much lower proportion of the civil disturbance innovations of fire and police departments. 17.1 percent (32 of 187) of fire department innovations were changes in material resources. For police, the percentage is even lower (10.7 percent, 26 of 242). The mean number of material resource innovations per organization is remarkably similar in each set of organizations. Police average 1.9, fire 2.0 and disaster organizations 1.2 material-resource innovations each. In all three, standby resource changes predominate among resource changes. Additions of routine resources account for a total of only six changes.

There are not only similarities in the mean number of innovations per organization, but also in the nature of the material-resource innovations themselves. Communications equipment were popular innovations in each set of organizations. This is especially true of the disaster organizations. Intraorganizational communications systems comprise over one-fourth (25) of the eighty-five material resource innovations by disaster organizations. Mobile battery operated radios are the most popular type. Another twenty-eight innovations are interorganizational communications systems. Twenty of these linked two organizations while the other eight linked at least three and as many as nine organizations. Together, these types of communications equipment changes account for over thirty-six percent of all innovations by disaster organizations. Auxiliary generators are the next most common material resource addition. Another common example is laying in supplies for use in disaster responses. A few less common types of resource innovations include one storm observation shelter, one acquisition of additional warning sirens, one mobile clinic, and one mobile canteen. The two routine resource changes were both alterations in facilities used everyday, but changed for the purpose of improving disaster responses.

Both police and fire departments averaged slightly more resource changes per organization. Here again, communications equipment was common. Nine communications innovations were made by fire departments and fourteen by police. Emergency operations centers -- rooms equipped for gathering information during crises -- account for three fire department and six police changes. The remaining eight police innovations in this area are mobile command and communication facilities which permit officers commanding operations in civil disturbances to be on the scene, but still have strong communications.

Beyond the common need for communications, fire and police material resource innovations reflect their particular problems and tasks in civil disturbances. The most frequent resource innovations by fire departments

are acquisition of protective equipment such as visors, goggles and cab coverings. These sixteen changes are responses to dangers of attack and harrassment encountered by fire departments in civil disturbances. Fire innovations also include six adoptions of additional reserve fire-fighting equipment. Fire suppression demands experienced in some civil disturbances made routine levels of equipment inadequate, but the relative expense of new equipment kept these acquisitions at modest levels. Two departments purchased weapons for use in civil disturbances. Other departments regarded the adoption of social control tasks (and the partisanship such weapons implied) as highly undesirable alterations of the traditional firefighter role. Police, on the other hand, invested much more in weapons, making fourteen acquisitions of special riot equipment above and beyond their routine weapons capabilities. These acquisitions are major in scope. They include guns, gas, gas delivery devices, as well as gas masks and other protective equipment.

Conclusions

Police and fire departments average only slightly greater numbers of material resource innovations than disaster organizations, but they concentrate a much lower proportion of their overall innovations in this type. Only 17.1 percent of fire innovations and 10.7 of police innovations are in material resources, compared with 58.2 percent of disaster innovations. A much higher proportion of police and fire innovations change social features of their organizations. Thus, the higher percentage of resource innovations among disaster organizations is because of their lower propensity to adopt social innovations.

Patterns of Innovation Compared

The differences among innovations and their frequencies described above are also of significance when we examine the associations between their patterns and differences in organizational types and social contexts. This section begins the search for patterns in the social contexts most conducive for innovations in anticipation of crisis responses. It compares the patterns of innovations found in the several populations under study. First, the similarities and differences between natural disaster and civil disturbance innovations are discussed. Then comparisons within each of these categories are made. Patterns of innovations in each of the four cities following disasters are compared. Finally, the contrasts between fire and police department innovations are described.[6]

Natural Disaster and Civil Disturbance Innovations

Direct comparisons of the natural disaster and civil disturbance innovations described in this study are difficult. The entire range of responsible organizations is included in our population of disaster

organizations. However, our civil disturbance innovations are drawn from
only police and fire departments -- the most innovative of local
organizations with civil disturbance responsibilities. This must be taken
into account when making comparisons of the number and distributions of
innovations between these two categories. Even so, some important
comparisons can be made.

First, our data implies organizations in communities anticipating
possible responses to civil disturbances are likely to make more
innovations in social routines than those in communities which have
already experienced disaster. Table 7 shows this important comparison.
Hardly any innovations in social routines of organizations are found
among seventy-three disaster relevant organizations. They made only one
change in organizational domains and only six in routine divisions of
labor. Four other routine social innovations changed training. These
data are from four communities. They show a mean of only slightly more
than two routine social changes per community. More routine social
innovations are found within individual fire or police departments that
may face civil disturbances than in entire communities after natural
disasters.

The fire departments of sixteen communities have a mean of 2.7
innovations in social routines, while the police departments of fourteen
cities have a greater mean of 7.1 routine social changes each. Obviously,
this may only be the tip of the iceberg. Taking into account possible
innovations by other civil disturbance relevant organizations which are
excluded from the present study, our data clearly implies a higher level
of innovation in routine organizational social systems within communities
anticipating possible civil disturbances. These innovations, of course,
are of greatest general sociological interest because they are structural
changes in organizations. Only one of the entire seventy-three disaster
organizations has more routine social changes (three) than the sixteen
fire departments average, and this organization does not come close to
matching the mean number of such innovations for police departments.

Our data also imply a similar contrast for standby social
innovations. Table 8 shows these innovations are probably more prevalent
in communities anticipating civil disturbances than in those having
experienced natural disasters. The entire population of disaster
responsible organizations in four communities have a mean of 7.4 standby
social changes per community. Together, fire and police departments
average the same number of such changes. Fire departments of sixteen
cities have a mean of 4.0 standby social innovations each, while police
departments of fourteen cities have a mean of 3.4 each. It is clear from
other field experience and data that other local organizations also have
made innovations anticipating civil disturbances. Although, other
organizations have not innovated as much as police and fire departments,
it is certain that total community patterns of standby social innovations
for civil disturbance exceed those of natural disaster. This conclusion

should not be over-rated by itself, but it does provide another example in the overall pattern of contrasts between organizations anticipating natural disasters as compared with civil disturbances. However, these contrasts in routine and standby social innovations do not occur for material resource changes.

Distributions of organizational characteristics of innovations can also be compared for natural disaster and civil disturbance innovations. As Table 4 shows, natural disaster innovations largely tend to be standby material resource changes (56.6 percent). As Tables 5 and 6 indicate, civil disturbance innovations tend toward social rather than material resource changes. Overall, 46.8 percent of civil disturbance innovations are standby social changes and 37.3 percent are routine social changes. This is because of greater numbers of social innovations not because of a de-emphasis of material resource innovations.

It is clear from the data of this study and the prior knowledge which prompted it, that natural disasters have not provoked the same patterns and levels of change found among civil disturbance organizations. These patterns of difference cannot be precisely stated with our data, but it is still the responsibility of an exploratory study to provide hypothetical explanations of them. This problem is taken up in the following chapter. First, however, we will look for systematic patterns of differences among our four disaster communities and between police and fire departments.

Innovations in Four Communities Following Disasters

Patterns of innovation are very similar in three of the disaster cities, but strikingly different for the fourth. Together, Explosion City, Earthquake City, and Tornado City have seventy-nine organizational innovations, twenty-nine, twenty-two and twenty-eight respectively. Alone, Hurricane City has sixty-six. Table 9 shows the percentages of innovations in each of these cities. Almost half (45.5 percent) of all disaster innovations are concentrated in Hurricane City. Table 10 shows the source of this great disparity in numbers of innovations among these cities is largely because of the large number of standby material resource changes in the Hurricane City.

The organizations of the Hurricane City also average a greater frequency of both routine and standby social changes. This city has six of the fourteen changes in organizational social routines found among the disaster organizations. They include three training changes, one new routine task, one new position and one new role relationship. The task change is the only change in routine organizational domains made by any of the seventy-three disaster organizations. The two changes in routine division of labor are exceeded only by four changes of this type in Earthquake City. The three training changes are matched by the same

TABLE 9

NUMBER AND PERCENTAGE OF INNOVATIONS
IN EACH OF FOUR CITIES FOLLOWING DISASTER (N=145)

City	Number	Percent
Explosion City	29	20.0
Earthquake City*	22	15.2
Hurricane City*	66	45.5
Tornado City*	28	19.3
Total	145	100.0

* City also had an additional new organization as an innovation. New organizations are not included in these totals.

number in Explosion City. Overall, however, a high proportion of these few changes of disaster organizations as enduring social systems are found in the Hurricane City.

Both the Hurricane City and Explosion City have sixteen standby social innovations, while the other two cities total fourteen between them. More revealing than mere numbers are differences in the innovations themselves. The Explosion City, as Table 1 indicates, owes its higher total of standby social innovations to a greater than average number of written disaster plans, fourteen counting all varieties. On the other hand, the Hurricane City's higher numbers of standby social innovations are the only changes in standby organizational domains recorded among all the disaster innovations, and four of them comprise all but one of the changes in standby divisions of labor by disaster organizations. These unique disaster innovations are the most interesting contrast provided by the distribution of disaster innovations among the four communities.

Table 10 provides the details of Hurricane City's domination of standby resource innovations. Twenty-six of this city's forty-four resource innovations are communications systems or equipment. These innovations are not unique. The other cities have twenty-seven similar innovations. Nine of ten acquisitions of auxiliary generators are in this city. Other sources of Hurricane City's accumulations of material resource changes are scattered throughout several other types of innovations. In its number of standby material resource changes, and in the number and nature of its routine and standby social changes, the Hurricane City provides a decided contrast with the general pattern of innovations by disaster organizations.

Police and Fire Innovations

Overall, both police and fire organizations average considerably more innovations than disaster organizations. Fourteen police departments have a mean of 17.3 innovations; sixteen fire departments have an average 11.7 innovations each. The comparison takes on greater meaning when different types of innovations are compared. Fire and police organizations have closely comparable frequencies of material resource and standby social innovations. However, they greatly differ in their average number of routine social innovations in anticipation of civil disturbances. Police have a mean of 1.9 material resource innovations per organization, while fire have 2.0. Police have 7.3 standby social innovations compared with 6.2 for fire departments. In contrast, police average 8.1 routine social innovations. Fire departments average 3.5.

In many ways the types of innovations undertaken by police and fire departments are quite similar. Most notable are parallels in some of the standby social innovations and almost all of the routine social innovations each made. Several of the innovations by both organizations change standby organizational domains by changing planned operations or

TABLE 10

DISTRIBUTION OF TYPES OF INNOVATIONS IN FOUR CITIES (N=145)

| City | Routine Innovations | | Standby Innovations | | Totals |
	Social	Resource	Social	Resource	
Explosion City (n₁=29)	3 (10.3%)	0 (0.0%)	16 (55.2%)	10 (34.5%)	29 (100.0%)
Earthquake City (n₂=22)	4 (18.2%)	2 (9.1%)	9 (40.9%)	7 (31.8%)	22 (100.0%)
Hurricane City (n₃=66)	6 (9.1%)	0 (0.0%)	16 (24.2%)	44 (66.7%)	66 (100.0%)
Tornado City (n₄=28)	1 (3.6%)	0 (0.0%)	6 (21.4%)	21 (75.0%)	28 (100.0%)
Total	14	2	47	82	145

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procedures for civil disturbances. There are, of course, variations in the content of such standby procedural changes consonant with the different tasks of police and fire departments. However, the greatest contrast for standby social innovations between them is the complete absence of adoption of standby task and jurisdiction changes by police. Fire departments made five standby task changes and thirteen changes in standby jurisdictions. Otherwise the parallels between police and fire departments for standby social are very close.

Material resource changes also tended to be quite similar. Most differences can be traced to differences in the organizations' tasks. For example, fire departments purchased fire fighting equipment and police acquired riot weapons. However, one contrast does not seem to be because of differences in civil disturbance tasks. Police were much more successful than fire departments in acquiring elaborate emergency command and coordination centers. In general, the material resource changes made by police departments are more elaborate and expensive.

Even among the routine social innovations where police so clearly predominated in numerical terms, the nature of the innovations made by the two types of organizations are quite similar. All of fire innovations in social routines are related to the newly encountered problems of relations with potentially hostile segments of their communities. Most of the police social routine innovations are too, except for thirteen innovations which adopted routine planning tasks or established planning subunits. Again, however police organizational innovations surpassed those by fire departments in their scope. Community relations units are generally larger and were established earlier, for example. Thus, police departments exceed fire departments by large measure both in average number of innovations and in the scope of routine social innovations.

Conclusion

This chapter has introduced the innovations of the study and classified them according to a conceptualization of the organizational characteristics of innovations in anticipation of crisis responses. It has described the innovations and their patterns for three populations of organizations. It has descriptively answered one of the primary research questions of this study: What is the organizational nature of innovations anticipating crisis? It has emphasized both similarities and differences in their natures. On the whole, innovations which change their organizations substantially as social systems are rare. However, several variations within this pattern have been described. The next chapter, the second portion of the analysis of this study, identifies hypotheses which promise to explain both the overall pattern and its more interesting variations.

1. Three qualifications should be made of our identification of
    material-resource changes as nonsocial. First, it is beyond the
    scope of the information upon which this study relies to claim that
    all innovations so classified did not in any way change social features
    of organizations. In practice, the designation means simply that
    despite questions designed to reveal them, no changes in social
    arrangements were reported as an element of the innovation. Second,
    this designation is not intended to mean there are not, nor will not
    be, social consequences developing from resource changes. The study
    is limited to innovations and does not include changes which might
    be consequences of innovations. Finally, this designation does not
    mean that innovations in resources are not consequences of social
    conditions.

2. The concept of organizational domain is suggested by Levine and
    White (1961: 89-97). The definition and its components as used here
    are an extension and generalization of their application of the
    concept to health service organizations. They define the domain of
    such organizations in terms of (1) diseases covered, (2) population
    served, and (3) services rendered. The labeling of the components
    as tasks, jurisdiction and activities (procedures) draws especially
    on Bakke (1969), and Dill (1958).

3. Some of the six civil disturbance innovations in standby membership
    may also be interorganizational relationships. The data do reveal
    that one of the additions of auxiliary firefighters involved retired
    firemen and was not interorganizational. However, data on the
    remaining five innovations do not indicate the source of the auxiliary
    personnel.

4. The items used to collect information on standby interorganizational
    changes in police and fire departments tend to break multiple written
    agreements into several dual ones. Thus, the number of multiple
    standby interorganizational innovations is understated by the data.
    Correspondingly, the number of dual written innovations is inflated.
    Also, unwritten standby interorganizational arrangements are not
    recorded by the data collection procedures. This makes comparisons
    between civil disturbance and disaster populations for interorgani-
    zational level innovations difficult. Comparisons within these two
    major categories, however, are still useful.

5. It seems very likely that the absence of standby division of labor
    innovations reflects lack of depth in analysis of some available data.
    There are unsystematic indications that the innovations in plans
    classified as standby procedures included reorganizations of police

standby divisions of labor. It is clear, at the very least, there are serious adjustments for police in transition from routine to civil disturbance operations (Wenger, 1973).

6. Because our data sources gathered information on changes in inter-organizational relationships differently, changes are excluded from the comparisons between natural disaster and civil disturbance innovations. See Note 5 above.

CHAPTER IV

INNOVATING AND STABLE ORGANIZATIONS: PATTERNS AND ORGANIZATIONS

This chapter presents the second analysis of the study, the condi-
tions which may explain patterns of organizational innovation. This study
suggests several conditions as hypothetical explanations or organizational
innovations. First, several patterns drawn from the analysis of the
organizational characteristics of innovations in Chapter III are described.
These are regularities and contrasts which invite explanation. The second
section of the chapter sets the stage for explaining these patterns.
It introduces a very simple model of organizational innovation and concepts
appropriate to describe it. This model is then used in the next three
sections of the chapter where conditions hypothesized to influence
organizational innovation in anticipation of crisis response are introduced.
The final section of the chapter summarizes the analysis.

Patterns Requiring Explanation

The categorization and description of 574 innovations has accom-
plished one of the objectives of this study and laid the groundwork for
the other. We have described the organizational characteristics of
innovations in anticipation of crisis. These descriptions show that all
innovations are not the same. They vary in the manner that they change
their organizations. "Organizational innovation" is not a unidimensional
category, but one that subsumes a number of significant qualitative
differences almost as diverse as the dimensions of the organizations
themselves. Beyond providing a systematic classification of the innova-
tions and their differences, the proceeding description is the foundation
of the other objective of the study -- to generate theory about the
conditions influencing the adoption of innovations in anticipation of
crisis. Having established that these innovations are not a unitary
social phenomena, we must analyze the conditions that tend to bring about
one kind of innovation as opposed to the other. In this section we set
forth several problems such a theory should attempt to deal with.

The first problem which can be drawn from these descriptions is to
account for its overall pattern. Generally, innovations in anticipation
of crisis do not substantially change their organizations. Their
organizational characteristics indicate that they are but minor adjust-
ments in their organizations as social systems. To account for this we
must explain why minor adjustments are made in the face of such major
threats to community life as natural disasters and civil disturbances.

Second, there is the multiple problem of explaining variations in the pattern of innovations. Organizationally significant changes vary from the general pattern and cannot be explained by the same configuration of conditions. The social contexts in which these more noteworthy innovations take place contrast with those of minor innovations. Proportionately, routine social innovations occur more often in preparation for civil disturbances than natural disasters. There is also a contrast between the two types of organizations studied for civil disturbance preparations. Extensive modifications appear more often in police than fire departments. Also, innovations are unevenly distributed among the four cities that had experienced disasters. Routine and social changes are clustered in the Hurricane City, a community with a disaster subculture. In both the civil-disturbance and natural disaster populations there is a tendency for innovations to be channeled into selected structural locations. This is especially true of more extensive organizational changes. In the disaster communities they are relegated to small organizations specializing in disaster preparedness. In police and fire departments they are located in small structurally segmented organizational subunits.

These contrasts in the social locations of innovations that make more significant change in their organizations are partially paralleled by differences in the frequencies for all types of innovations. Totaling all forms of innovation disaster organizations have lower mean numbers of innovations than civil disturbance organizations. Police have higher frequencies of innovations than fire departments. And, the Hurricane City has higher numbers of innovations than any of the other three disaster communities.

In addition, there are not only contrasts among populations of organizations, but also among the organizations within each population. Some police departments have greater levels of innovation than others, both in terms of total frequency of innovations and their organizational significance. The same is true of fire departments, and it is especially noticeable within each of the four disaster communities.

Each of these contrasts poses a separate aspect of the overall challenge of explaining the occurrence of innovation in anticipation of crisis response. The description and analytical classification of the innovations presented in the last chapter provides the means to distinguish one pattern of innovation from another. Patterns in the distribution of innovations among communities, among organizations, and within organizations are examined in this chapter in order to outline the conditions for innovation suggested by our data. The first step is to present a simple model of organizational innovation that is consistent with these observed contrasts and patterns.

A Perspective on Organizational Innovation

A basic mechanism of change in formal features of organizations is indicated by our data. It emphasizes the normative aspects of organizational innovation. Any organizational feature is potentially the subject of normative evaluation. That is, all of the formal features of organizations we have studied could be assessed according to their consistency with social definitions of what organizations should be and what they should do. Proposed innovations are also open to the same sorts of normative evaluation. Organization members and decision-makers as well as interested groups in the organization's environment can ask whether innovations are consistent with norms defining the appropriate activities and concerns of an organization.

The normative component of organizational innovations is most obvious for innovations in organizational domains. The elements of organizational domains are defined in terms of shared social norms. Any other innovation may also be assessed for its consistency with organizational norms. For example, should a police department have a community relations program? Or should a public works department have an elaborate disaster plan and invest in standby equipment?

There are normative expectations about what organizations should be and what they should do. These norms are critical criteria influencing an organization's orientation toward proposed innovations. If these norms change (or if persons in positions of authority think they are changing) an important condition for innovation is present. Our study strongly suggests that changes in such normative patterns are a major condition for organizational innovations. When normative change promoting innovations anticipating crisis is not present, then the existing norms attuned to routine organizational problems act as a condition for stability. They may even override other conditions promoting innovation. This is the case when organizations learn that measures to improve subsequent crisis responses could be adopted, but do not adopt them.

Thus, norms about the appropriate domains of organizations are potentially conditions for either innovation or stability. Groups within and outside the organization share these normative definitions with those with authority to change their organizations. Norms are sustained or changed through interaction. It is in this interaction that the crucial conditions for either stability of innovation arise.

William Evan (1965) provides a useful set of concepts which emphasize the role of an organization's environment in sustaining or changing norms which influence its actions. Evan draws a parallel with the social-psychological concept of "role-set" and "reference group theory." He points out that each organization has an "organization-set" of groups in its environments with which it shares, develops, maintains and changes

norms governing and evaluating its activities. The authorities within an organization have conceptions of what their organizations should do, shaped and influenced by other organizations in their environment.

Evan suggests these norms are influenced by relationships with two types of organizations. First, there are comparative reference organizations. These organizations with similar domains provide models of appropriate action for each other. Just as one person can be a model of behavior for another, one police department can provide a model of action for another. The norms of an organization can be defined by the example of another similar organization.

Second, there are normative reference organizations. They are dissimilar organizations with which the focal organization has contact and interaction. These organizations also influence the focal organization's norms, but not by example. Any other means of influencing the focal organization's norms is subsumed by the concept of normative reference organization. Interdependency between two organizations may make them normative reference organizations for each other. For example, a fire department's dependence on police for protection during civil disturbance responses may increase the influence of police upon fire department norms during crisis response. Whatever the mechanism -- persuasion, coercion, or utilitarian compromise -- any interorganizational relationship which influences an organization's norms, but not by example, is a normative reference organization.

Accounting for the data of this study requires a view of organizational innovation which can simultaneously account for the stability of most organizations as well as the innovations of some. Both can be plausibly interpreted by (1) viewing organizational norms as regulators of innovation, and (2) finding an important source of both stability and change of these norms in interorganizational ties with normative and comparative reference organizations. Events and activities within interorganizational networks thus become primary influences upon norms defining standards of what organizations should be and what they should do. In the case of organizations anticipating crisis response we find a neglect of innovations to improve response where interorganizational ties emphasize and stabilize a normative preference for routine organizational domains. However, if interactions within a network of comparative or normative reference organizations promote emphasis on preparedness for subsequent responses, organizations are much more likely to innovate. In both cases, interorganizational ties may promote or deemphasize innovations. But even more important is the capacity of the interorganizational field to legitimate or delegitimate decisions to innovate, regardless of whether the original impetus toward innovation results from organizational learning from its own crisis response experience or from reports of the experience of others. The crucial selective factor is the essentially normative confirmation (or disconfirmation) that the act of innovation is expected of the organization. Of possible equal significance is the provision of actual models of innovation by comparative reference organizations.

With this model in mind we now turn to three analyses where it plays an important part in interpreting patterns in our data. The first analysis is of the overall tendency toward minor changes. The second is of the higher levels of innovation in the Hurricane City as compared to the other three communities experiencing disaster. And, the final analysis is of two contrasts. The first is between natural disaster and civil disturbance organizations and the second is between police and fire departments.

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Interpreting the General Pattern:
Innovations Marginal to Organizational Domains

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There are three aspects to the general pattern of organizational innovations observed in this study. First, as is documented in Chapter III, the innovations tend to be minor in nature. Analysis of their organizational characteristics indicates that they change their organizations very little. Second, analysis of the distribution of innovations in the organizations of the four disaster communities shows that they are channeled into a few organizations with specialized disaster duties. Third, within police and fire departments certain changes also tend to be channeled into special differentiated social locations. Innovations such as community relations programs tend to be isolated in specialized subunits and do not have direct impact throughout the organizations. All three patterns have in common an avoidance of "contaminating" traditional organizational routines with innovations designed to improve subsequent crisis responses. This section interprets all three of these general patterns by pointing out that crisis innovations are marginal to the domains of most organizations being studied. At the end of the section this interpretation is linked with normative mechanisms that help to explain the stability shown by most organizations in this study.

Most of the innovations found in this study are minor changes. They fail to change their organizations as ongoing social systems. They tend to change either material resources or standby social aspects of organizations. Why are such immense threats as natural disasters and civil disturbances met with such organizationally feeble measures? Because, crises are not everyday problems. Disaster concerns are remote from the daily routines of the organization. The problems prompting innovation in anticipation of crisis are marginal to routine organizational domains. The standards by which organizations are evaluated and rewarded compete with the claim of crisis preparedness. It is difficult to make an investment of organizational resources or effort to prepare for a contingency which is remote. It is hard to sustain commitment to a line of activity not central to the normative patterns defining expectations by which others judge the organization.

Innovations in anticipation of crisis, therefore, are deemphasized not only because of initial marginality of crisis concerns to routine domains, but especially because elements of organizations' environments actively reaffirm and stabilize norms which influence the organization to

evaluate itself according to other criteria. This pattern can be seen in disaster organizations especially. There are organizations, particularly civil defense, which have routine domains which legitimize their attention to disaster preparedness. In a given community the domains of most other organizations do not legitimize particular attention to disaster preparedness -- even after response experience shows them something of the preparations which could be made.

In our four disaster communities this principle caused major innovations to be channeled into those few organizations which already had domains legitimating them. Almost every single change in organizational routines occurs in civil defense or Red Cross organizations. This tendency also carries over into standby social innovations where it is much less "rational." Disaster experience showed every organization problems of response that could be addressed by disaster plans. However, even standby changes tend to be concentrated into a few organizations with everyday problems legitimizing interest in disaster preparedness. Our principle does not hold, however, for material resource changes. In communities with disaster experience material resource changes predominate and they are not channeled into specialized organizations. Thus, different principles and patterns hold for organizationally different types of innovations.

One case described by Anderson (1969) vividly shows that there were shared norms which permitted only a few organizations to prepare aggressively for disaster, even though almost all the disaster-relevant organizations surely could not escape the knowledge that their responses could be very much improved. At a time following the earthquake when the civil defense had not yet adopted several innovations, and overall there was little community preparation for subsequent responses, one man's attempts to upgrade the community's disaster capabilities were rejected. A manager of one subunit of the Earthquake City's public works department had been very deeply involved in the community's response to the earthquake. He and several fellow employees had responded early to the supply and resource needs of some portions of the community and they emerged as one of the primary disaster response coordinating organizations in the city. After the disaster, before local civil defense had begun to seriously prepare for possible future disasters, this man began equipping his subunit of the public works department for disaster responses. These efforts were resisted after a point at which the innovations violated the community's norms about which organizations were to specialize in disaster preparations. This man was stopped and eventually lost his job (although not directly for his disaster preparations).

In three of the disaster cities the small specialized organizations could not absorb all of the opportunities for innovations being channeled to them by the other community organizations not concerned with matters so marginal to their domains. When the specialized organizations could not handle the level of innovation, crisis preparation innovations were not allowed to "spill over" into other existing organizations. Instead,

new specialized organizations were created. Thus, one condition contributing to the minor nature of organizational innovation in anticipation of crisis is the deterrence of the marginality of crisis concerns to everyday organizational domains. However, this tendency is not automatic. It operates in part through the reinforcing expectations of normative reference organizations.

This channeling of innovations into specialized organizations recalls Rogers (1962) identification of the "compatibility" between an innovation and the social system in which it may be adopted as a factor in its adoption. This condition operates in other cases covered by our data. First, among fire departments preparing for civil disturbances two innovations were resisted because of normative incompatibility with organizational domains. These were the use of firefighters for social control activities and for security tasks. Each of these innovations were adopted by only two of the sixteen departments, and many fire officers spoke out strongly against the innovations. In fact, the chief of one of the departments which had adopted the standby social mechanism of social control tasks revealed the innovation was made against his wishes by the order of his superior, the safety director. This resistance can in part be accounted for because of anticipated increases in the danger to firemen, but it is also clear the innovations were rarely adopted because they were marginal to their own and others' conceptions of fire organization domains. On the other hand, police departments did adopt new routine tasks and divisions of labor to incorporate police community relations programs. These programs are marginal to pre-civil disturbance police domains and even antithetical to some traditional police ideologies and practices. Yet, they were adopted. Other factors overcame the negative influence of domain marginality. The same is true of fire departments; while they resisted social control duties they did accept community relations tasks. However, for both the police and fire organizations community relations programs were channeled into relatively narrowly specialized subunits of the organizations. Again, in a manner strictly parallel to the channeling of disaster innovations into specialized organizations, innovations marginal to domains are isolated from really interfering with routine organizational domains by segregating them into specialized elements of the division of labor. Both are examples of the dysfunctions of functional differentiation. Disaster response skills ideally would permeate all the community organizations which must respond. Similarly, for police the need for improved police community relations is shared throughout the organization, but the marginality of the innovations to their organization's routine domains keeps them segregated within specialized structural units.

Thus, three general patterns of innovation can all be interpreted and hypothetically explained by the marginality of crisis problems to routine organizational domains. First, crisis innovations are organizationally minor. Second, they tend to be channeled into specialized organizations. Third, within organizations they tend to be isolated in differentiated subunits. The negative factor of marginality to domains

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operates uniformly, but even so, exceptions to our general pattern are found in the data. The next two sections suggest additional factors which overcome and modify this tendency toward only modest change in anticipation of crisis.

Disaster Subculture and Innovation

Hurricane City has a pattern of innovations far different from the other disaster cities. This section discusses several hypotheses which may account for the clear difference. Several possible interpretations are criticized. Finally, it is shown that special normative expectations associated with a disaster subculture promote greater levels of organizational innovation following disasters. Ironically, because of its disaster subculture the city that was already best prepared innovated most to improve future responses.

The Hurricane City has sixty-six innovations in anticipation of future disaster responses. This number far exceeds that of any other city. Also, the Hurricane City has some innovations more organizationally significant than other natural disaster cities. This city has a disaster subculture -- a set of latent social guidelines for behavior in disaster situations. Disaster subcultures serve as an alternative social system appropriate for disaster. Some elements of Hurricane City's disaster subculture are individualistic -- including guidelines for individual safety, security of property, and so forth. Other elements of the subculture are organizational standby social mechanisms -- alternative social bases for organizational action built up during experience and planning for hurricanes. Even with these ready-made standby social mechanisms, the organizations of the Hurricane City innovated more frequently and, especially interestingly, adopted several new standby social tasks -- an innovation type unique to this city.

There is a uniform number of innovations in the Explosion, Earthquake, and Tornado cities, while the Hurricane City has almost as many innovations as the other three combined. Comparisons of the cities eliminates some plausible explanations. First, it should be noted that the number of organizations surveyed in the cities does not account for the greater numbers of innovations in the Hurricane City. This city did supply the greatest number of organizations for our sample. However, its twenty-two organizations exceeded the number from the Earthquake City by only one and the other two cities by three and eight. Hurricane City averaged 3.0 innovations per organization while the other cities ranged between 1.0 and 1.7 innovations each.

Another possible interpretation is that the Hurricane City may have needed more innovations to bring preparedness to an acceptable level. At least two senses of greater need can be eliminated. Greater need may be recognized because of a more demanding disaster experience, or it may exist because of inferior initial preparedness. Neither of these

plausible accounts fits this case. While the hurricane and flood disaster was indeed severe and extensive, it is difficult to claim it exceeded the earthquake's scope and severity of disruption. Its duration of impact was greater than the tornado, and it disrupted more aspects of its community than the explosion. On the whole, however, the actual demands of response were clearly less only in the explosion disaster. On the other hand, the explosion's direct threat to life, made its fewer demands higher in priority and urgency. In any case, there is no evidence which suggests the greater numbers of innovations can be attributed to greater severity of disaster problems.

Also, it is quite clear that there was not greater need for innovations because of inferior initial preparedness in the Hurricane City. Without doubt, the Hurricane City was the best prepared of the four cities. The city is highly vulnerable to hurricane disasters and had experienced numerous threats and several impacts prior to the disaster we consider. In contrast to the other cities, the Hurricane City had larger, better equipped and more vital disaster organizations. Civil Defense, Red Cross, and other local disaster organizations were much more attuned to possible disaster problems and much more experienced in meeting them.

The greater size of Hurricane City is another plausible interpretation for its greater level of post-disaster innovations. Because of its size, this city has more total wealth and resources than the other cities studied. Perhaps, a greater capacity to pay for the specialized concerns of disaster preparedness may have resulted in greater numbers of innovations. However, it must be remembered that this city was already supporting disaster-related expenses far in excess of the other cities. For example, its civil defense organization is over four times as large as the next largest studied. Proportionately, Hurricane City has greater disaster preparedness than the other cities. At best, size and wealth are only very partial explanations for the greater numbers of innovations in this city.

The conclusion prompted by the data is that existence of a disaster subculture prior to disaster response is a condition promoting innovation, if new disaster problems are encountered. The particular hurricane disaster in question did have a novel element which dramatically provided the opportunity for learning beyond past experience. The disaster had a dual impact. First, the intense impact of the hurricane; then, unexpectedly, floods topped the levees shielding the low city from surrounding waters. The special, unanticipated problems of the less intense, but more enduring floods provided a focused reference for innovations. These were specific problems clearly beyond the preparations made in light of past experience. They could be effectively addressed by selected minor changes in preparations and capabilities.

In Hurricane City organizational learning was an effective condition for innovation when it built upon already elaborate knowledge and planning. But it was not as effective in the other three cities. Why doesn't a

completely new disaster experience lead to at least a comparable pattern
of innovation? One reason may be the feeling that isolated disasters
are unique and are unlikely to be repeated. While the Earthquake City
and the Tornado City are located in areas especially prone to these types
of disaster impacts, the cities had not experienced disaster before.
The single experience may be more easily regarded as unique. Future
disasters may seem less imminent and less worthy of attention. It may
also be more difficult for less prepared cities to isolate particular
problems to address with innovations. Relatively unprepared communities,
such as the Earthquake City, experience too many problems beyond their
capacity to respond. Without past experience they have no basis to choose
the particular problems toward which to channel limited capabilities to
innovate. The wide gap between the city's capacity to respond and disaster
demands may present such a large problem that selective innovations
which substantially reduce that gap do not easily suggest themselves.

The strongest interpretation of the mechanism by which a disaster
subculture facilitates organizational innovation refers again to the
normative nature of organizational domains. In Hurricane City the
disaster subculture meant the legitimacy of many organizations' concerns
with disaster preparedness was already established. For many organizations
to prepare for disaster responses was not only permissible but was widely
expected. Disaster preparedness is normative under a disaster subculture.
The expense and diversion of organizational concerns from routine matters
are less likely to deter innovations. In the case of a disaster
subculture, the stable and newly reinforced norms of what an organization
should be and do are a positive condition for change.

Mobilized Social Networks as a Condition for Innovation

Social network is a term coined by S.F. Nadel (1957). As defined
by Olsen (1968), a social network is a functionally specialized social
organization that links together numerous associations, groups, and
other types of organizations throughout a society, all of which are
interrelated through their concern with a common set of activities.

Thus, the different networks within our society which are concerned
with the activities of preparation for crisis response may differ signifi-
cantly in their consequences for innovation in local organizations.
Social networks include organizations who face the same problems and
whose responses to them are potentially influential upon each other.
Interaction and communication among potentially innovative organizations
which are "comparative reference organizations" (Evan, 1965) for each
other appears to increase innovation. This is similar to the "interaction
effect" found in studies of adoption of innovations by individuals
(Rogers, 1962). The interaction effect generally represents the effects
of social relationships upon innovation adoption as contrasted with
purely rational economic influences. Rogers' (1962) analysis of
adoption of innovations by individuals clearly indicates the importance

of such social variables. They also seem important in the present study. Among police and fire departments, frequencies of interaction and consultation increased rapidly after the threat of civil disturbances became manifest in 1965. Often seminars and consultations were expressly oriented to solving mutual problems of adequate standby social mechanisms for response to civil disturbances.

Another important aspect of social networks is the role of the "change agent." In present usage the change agent usually is some agency which purposefully encourages or facilitates the adoption of an innovation by the focal organization. Police departments, for example, have been the targets of numerous change agents facilitating innovations in their approaches to civil disturbances and their general relationship with black communities. Federal legislation has provided partial funding of some innovations in order to encourage them. Also, by Presidential request, the vast resources of the military initiated interorganizational ties with the police departments in order to coordinate planning and intelligence operations. Through National Guard organizations, advice and information on constructing standby mechanisms has been channeled to various community police departments. Thus, the social networks functionally related to the domains of focal organizations have also become structurally related through new interorganizational ties and more intensive interaction.

In contrast, the social network sharing the common activities of preparing for and responding to natural disaster shows a much lower degree of activity by change agents, fewer interorganizational ties with comparative reference organizations, and less intense interaction through existing ties. The national-level organizations concerned with such activities have been less active as change agents and as sources of expertise on relevant organizational innovations. Another point of contrast can be drawn between the social networks concerned with natural disaster and civil disturbance. Compared in global terms, the resources of both local and national organizations concerned with response to civil disturbance are vastly superior to those concerned with natural disaster. Perhaps, even more importantly, there appears to be substantial "free floating" resources in the network of the former. Particularly for military organizations, which have a primary function of maintaining large numbers of men and resources in readiness rather than the ability to absorb the responsibilities of change agents and advisors is easily available. No such flexibility and capability is found in the network concerned with disaster response. Neither the gross amount of resources nor the availability of them even approximates that of small segments of the military. An additional intervening factor is that major emphases of the network have been more directed to concerns other than preparation for response to disaster. Through the Office of Civil Defense, the network emphasizes preparation for nuclear environment and through the Office of Emergency Preparedness, the Army Corps of Engineers, and the Red Cross it emphasizes physical and economic recovery rather than operational response to disaster.

The interorganizational ties within the social network of disaster-relevant organizations are not this conducive for innovation. The relations between national-level and local organizations stress preparedness for nuclear attack. Perhaps even more important is that local organizations, which might have similar disaster problems, experience them at different times. Therefore, at any given time there are not many comparative reference organizations available which are experiencing concerns about disaster problems. At best, local disaster-relevant organizations can rely on normative reference organizations -- those with shared concerns but different responsibilities and problems. The contrast with civil-disturbance organizations is that literally hundreds of police departments, fire departments, utilities companies, and many other types of organizations became concerned with civil disturbances at the same time. They shared their concerns and solutions with each other. Common problems could be addressed. A shared frame of reference developed which attached normative salience to innovations and provided models for them.

An inescapable conclusion is that the social system of organizational innovation operates at the community and social network levels. The present study indicates these are the levels at which the interorganizational processes producing normative change and, consequently, organizational innovations took place. Thus, theories or hypotheses which attempted to explain the innovations of this study could not restrict their attention to only conditions within organizations. It is very important to note that the organizations and their individual processes of innovation cannot be treated fruitfully in theoretical isolation from one another. In a literal sense, the organization's pattern of innovation is a product of the processes of these systems.

But, the individual organizations are not helpless captives of their social networks and communities. For example, as a social network of the U.S. Department of Justice, the U.S. Army, the National Guard and, of course, police departments mobilized to prepare for civil disturbance, we still found differences among departments in the whole-heartedness of their acceptance of police innovations. Some departments, especially after federal money began to flow, took an entrepreneurial stance toward the supports of the social network. They desired and aggressively fought for support in changing themselves. Others were rather passive and reluctant. These individual differences counted, but not as much as normative forces generated within communities or social networks.

Conclusions

This chapter has suggested conditions which may explain patterns in organizational innovations anticipating crisis responses. A simple model of the influences of norms upon organizational innovations is used to interpret major patterns of organizational innovation. Innovation

patterns are affected by the degree to which they are marginal to norms defining organizational domains. In turn these norms defining domains are maintained or changed by interaction with normative and comparative reference organizations.

This model is applied to major patterns of similarity and differences in innovation. Marginality of crisis problems to organizational domains helps explain the overall pattern: (1) the minor nature of most innovations, (2) the channeling of disaster innovations into specialized organizations, and (3) the isolation of major innovations in police and fire departments in segmented specialized subunits. The model also shows how a disaster subculture and a mobilized social network promote innovations. Chapter V summarizes the findings of the study and discusses its implications.

CHAPTER V

SUMMARY AND CONCLUSIONS

This final chapter summarizes the findings of the research and assesses their implications. The first section of the chapter reviews the most important findings of the study. The next section evaluates the conceptual classification of organizational characteristics of innovations. The third section explores the relationship of the study to current problems in the study of organizations and social change. The chapter concludes by suggesting future research studies which will complement or build upon the present effort.

The Findings of the Study

The study undertook two major research objectives: to describe the organizational characteristics of innovations made in anticipation of crisis response, and to further explore the conditions that explain these patterns of innovation. The first question was given priority because it had not been addressed by the research tradition to which the study is designed to contribute. It is a crucial question, because it is necessary to know the nature of innovations before we try to explain them. From addressing the second research question we identified several conditions for organizational innovation that supplement those found in prior studies.

Our analysis shows that all innovations anticipating crisis should not be treated as equivalent social effects. The 574 innovations found in the present study are quite diverse in the ways they change their organizations. An elaborate conceptual classification presented in Figure 1 includes twenty-three distinct types of innovations. Three major distinctions were initially made between routine and standby innovations, between social and material resource innovations, and organizational and interorganizational innovations. Additional dimensions are necessary to describe important differences among both routine and standby social innovations. Innovations changing social routines of organizations include changes in organizational domains, divisions of labor, training programs and membership criteria. The same distinctions, except for training programs, apply within standby social innovations. Organizational domains and divisions of labor show even further important differences among them.

The distributions of types of innovations in the three populations of organizations studied show both similarities and differences. There is an overall tendency toward innovations which do not change their

organizations greatly. In disaster organizations this tendency is manifested in a strong tendency toward material resource changes. In fire and police departments there is a higher proportion of more significant change but still the overall pattern of minor changes holds. These organizations do not have the high proportions of material resource changes found among disaster organizations, but they do tend toward standby social changes which, of course, are not incorporated into everyday organizational structures.

Police departments have the greatest numbers of innovations and also a higher proportion of organizationally noteworthy changes. Because they change structural aspects of organizations, routine social changes are viewed as the most significant changes found in the study. Police departments instituted a number of these changes largely in efforts to improve their relationships with minority peoples in their communities. However, it must be noted that even these changes are not of great scope in their organizations. Usually the innovations were relegated to specialized social locations in the organization, where their contacts with other segments of the organization are relatively remote. They were not integrated fully into the central day-to-day activities of their departments.

Thus, the exploration of the social nature of innovations anticipating crisis reveals similar patterns in several populations of organizations. At the same time systematic contrasts are apparent. Both the overall similarity of the innovations in each population of organizations and their patterned differences define explanatory problems. Besides permitting the systematic description of innovations, our data provides clues to the conditions and mechanisms of organizational innovation in anticipation of crisis. A simple model of the central role played by social norms in organizational innovation helps explain both the general pattern of innovation observed and deviant cases within it. This general principle, as specified through the concepts "domain marginality," "disaster subculture," and "mobilized social network," can be employed in hypotheses which explain why an organization will remain stable after responding to a major natural disaster and yet, will adopt innovations preparing for civil disturbances when they have not been experienced nor are even viewed as probable.

This model draws on a conceptualization of interorganizational relations suggested by Evan (1965), which fits our emphasis on organizational norms as the mechanism through which conditions for innovation and stability operate. Interorganizational relations with comparative and normative reference organizations are essential for either maintaining or changing organizational norms according to which proposed innovations will be evaluated. What is normative for a given organization at a particular time determines the compatibility of an innovation with the organization and the probability it will be adopted. At the same time comparative and normative reference organizations are factors in both the

stability and changes of such organizational norms. The conditions suggested exert their influence through the systems of interorganizational relations among comparative and normative reference organizations.

The contrast between problems of crisis response and norms defining routine organizational domains acts as a deterrent to high levels of innovation in anticipation of crisis response. These norms of routine domains are maintained within communities after disaster by other local organizations. Thus, organizations with routine domains more consistent with disaster problems tend to have many of the overall changes in their communities channeled to them. In a community with a disaster subculture the maintenance of stable expectations on the part of local normative reference organizations serves just the opposite function. It encourages higher levels of change because norms stressing that preparedness for disasters is appropriate already exist.

In the case of civil disturbance innovations in police and fire departments, society-wide sets of organizations related by shared and similar problems become mobilized about the issue of preparedness for civil disturbance innovations. As a consequence, norms shared among the organizations in these social networks changed in the direction of accepting and desiring to adopt innovations in preparation for civil disturbance responses. The social networks mobilized to change both police and fire departments did create pressures within both types of organizations for innovation. More changes and more significant ones occurred in police departments, partly because their mobilized social network not only provided normative demands for innovations, but also provided funds to pay for them. Fire departments also had rather high levels of innovation, but not as great as police. The fire department social network succeeded in mobilizing normative demands for innovations, but not the monetary support provided police (Weller, 1973).

Evaluation of the Qualitative Classification of Innovations

The attempt to systematically elaborate the organizational nature of the 574 innovations found in this study is unique within our research tradition. Usually stress is placed upon explanation at the expense of a clear grasp of what is being explained. From the descriptions made of innovations in prior studies it seemed clear that all innovations were not the same in the ways they changed their organizations. An attempt to map out the range of variation in these innovations resulted in the elaborate classification of innovations described in the last section. This section assesses the usefulness of the classification.

For the initial problem of describing variations in the organizational characteristics of innovations, the classification works very well. It categorizes innovations according to sound principles of social

similarities and differences. The classification also has a systematic internal consistency. Its applications are probably broad, because it draws on standard organizational concepts. It can probably be used to describe other populations of innovations, both for crisis preparation and for other purposes. It has been and promises to be a useful comparative tool.

On the other hand, the classification has some drawbacks which might suggest ways to improve it in the future. First, it taps only the static impact of innovations at the time of implementation. It fails to capture the uses to which innovations are put within the organization or the consequences and ramifications caused by the innovations in the organization. These shortcomings could not be overcome with the present data, which do not contain this information. However, if new data collection efforts are undertaken for use with this classification, it would be good to consider expanding the classification to capture the impact of the innovation on the organization.

Theories of Organizational Innovation

The second objective of this study is to contribute to theories that explain organizational innovation. Comparisons among our three populations of organizations suggest that these innovations are strongly influenced by normative, exogenous and episodic conditions. In some respects this combination of conditions varies from those stressed by current theories of organizational innovation. (See Zaltman, et. al., 1973 for summaries of current theories.) For example, these theories focus on the consequences of formal structure for levels of innovation. In contrast, our study suggests that stability or change in the normative definitions comprising organizational domains is closely related to the extent as well as the existence of organizational innovation. The nature of the data available for this study precludes systematic statistical verification. However, patterns in that data lend strong plausability to the hypothesis that the content, stability, and change of normative definitions of organizational domains is closely related to levels of innovation. This hypothesis appears to apply to organizations of widely varying size and structural characteristics. Related research by Kreps (1974) on the police and fire departments studied here provides a statistical analysis that supports this conclusion. This finding suggests a reassessment of the relative influence of formal structural characteristics on organizational innovation. The current trend in theories of organizations is away from traditional sociological perspectives that stress the social creation and maintenance of meanings in explanations of organizations and their actions. This trend appears to remove a perspective necessary for understanding the patterns of innovation our study has described.

The stress on normative conditions for stability and change is not the same as the more general point that subjective or perceptual factors

affect social behavior. The norms of organizational domains define what an organization <u>should be</u> and what it <u>should do</u>. Such definitions appear to be more substantial influences on organizational innovation than other types of subjective social or psychological orientations toward innovations. The need to reaffirm this point can be illustrated by both past research on crisis-related organizational change and the general organizational innovation literature. The research on organizational change after crisis response suggests that cognitive factors such as "organizational learning" (Anderson, 1969) and "experience of new demands" (Warheit, 1968) are primary conditions for organizational innovation. However, almost all organizations responding to major disasters or civil disturbances here encounter new demands and learn new operational modes. The problem is that only a small fraction make extensive innovations. On the other hand, police and fire organizations have adopted substantial innovations, even without organizational learning from civil disturbance responses. In some cases these innovations were adopted without a clear definition of how they would operate or what problems they would solve. The preponderant influence of normative as compared with merely cognitive definitions is supported by these patterns in our data. Organizations appear to innovate when they "should" rather than because they have "learned" of a problem or a new way of operating.

The same point can be applied to general theories of organizational innovation. In their summary and extension of current theories Zaltman, Duncan and Holbek (1973) distinguish "knowledge-awareness" and "attitude-formation" substages within the initiation (adoption) phase of the innovation process. If we must use the terms of their theory, our findings would suggest that the latter is a critical stage where great selectivity occurs. Among organizations experiencing disasters, awareness and knowledge of possible innovations was ubiquitous. The organizations that actually adopted innovations, however, were those for which a normative expectation of preparedness was an important element of their domains. This is seen clearly in two patterns: the channeling of innovations into specialized organizations such as civil defense and in the higher levels and greater scope of innovations made within the context of the disaster subculture of Hurricane City. If we were to use the conceptualization provided by Zaltman et. al. (1973) we would downgrade the influence of conditions making for awareness and concentrate upon those making for positive "attitude formation."

However, the traditional distinction between "attitude" and "norm" suggests further modification of the underlying model of this theory. There is an ample literature dealing with the social-psychological differences between attitudes and norms as bases for behavior. Here it is only important to stress that emergence and changes in norms are a group-level activity, while attitudes are conceived of as structural properties of persons. This distinction is essential for understanding why police and fire administrators would adopt innovations for civil disturbance responses while holding attitudes that were counter to the philosophy of the innovations, as sometimes was the case for community relations programs. Also, it helps to interpret the apparent irrational

adoption of riot training and riot-control equipment by administrators
who believed that there was virtually no chance that they would be
needed in their cities. Equally, it helps us to understand why adminis-
trators of disaster-experienced organizations would not implement
innovations that their learning experience showed to be relevant. These
administrators were responding to normative expectations for their
organizations, not necessarily their own attitudes and beliefs. The
stage theory synthesized by Zaltman, Duncan, and Holbek would provide
a much improved interpretation of our patterns of innovation if the
notion of social processes that either redefine or reaffirm the
normative elements of organizational domains were substituted for the
idea of processes mobilizing or forming "attitudes."

The emphasis on social norms as a central element in an explanation
of organizational innovation provides an opportunity for such theories
to have closer conceptual ties with traditional sociological paradigms
that stress the meaningful, symbolic basis of social action (Warriner,
1970). The present study "rediscovers" what has long been known, but is
now neglected by many who seek to improve the methodological basis for
verificational studies of organizations by conceiving of them as systems
of variables. (See, for example, Hage and Aiken, 1970, as well as much
of the rest of their work; Blau, 1970; or Blau and Schoenherr, 1971.)
Organizations are social, not mechanical, systems. This conceptualization
still has shortcomings. In fact, one noted organizational theorist has
recently decried the "phlogiston character" of our use of norms to
explain social action (Perrow, 1973: 125). However, the patterns of
innovation we have observed are well accounted for neither by theories
stressing formal structural characteristics nor those stressing the
awareness of new "facts" of learning. They do seem well ordered by the
idea that organizations have a symbolically defined, socially shared set
of normative definitions comprising their domain of social action.
Stability of domains thwarts innovations moving into new lines of action;
change in domains encourages such changes.

Our analysis also suggests that the important conditions associated
with stability and change in organizational domains are exogenous; that
is, they arise in the environment of the organizations they affect. In
this the results of our study contrast with some of the current theories
of organizational innovation. Here again the thrust of the present
literature is best represented by those who are developing theories of
the formal structures of organizations. They tend to stress the nature
and arrangements of internal aspects of the organization. For example,
the influential research of Burns and Stalker (1961) is of this nature.
With the exception of their stress on organizational interdependence
(Aiken and Hage, 1968) the theory developed by Hage and Aiken (1970) is
very similar. Finally, the summary and extension of Zaltman et. al. (1973)
also concentrates upon the influence of intraorganizational factors upon
the rate and scope of innovation. Our data are not especially sensitive
to the types of internal variations these theorists hypothesize are
crucial for innovation. However, it can be seen that the organizations

studied show great variation in size, complexity, formalization, and, presumably, other structural variables. These obvious variations are not related to the dominant patterns of innovation we found.

Thus, the theoretical implications of the present research are in line with the perspectives on change of what Perrow (1972) calls the institutional school of organizational theory. For example, Selznick's (1949) study of the Tennessee Valley Authority emphasizes the process of organizational accommodation to environmental constraints. Perrow (1972: 199-201) argues that the institutional school tends to under-emphasize the strength of the organization to resist environmental impingements and that it fails to realize that the environment of an organization is comprised of other organizations. These considerations show the usefulness of the concept of social network for a theory of organizational innovation. A social network (Nadel, 1957; Olsen, 1968), as we have adapted the concept, is the total web of relationships among all organizations concerned with a particular problem within a given society. While it would be very difficult to draw the boundaries of such a system, there can be no doubt that such interorganizational systems exist and are of great importance to the operation of modern societies. The organizations in the system are interlocked in series of interdependent relationships that supply some of the requisites of each.

Presently, we are concerned with the fact that among these requisites thus supplied are potential definitions of each organization's domain and sanctions constraining domains to be within normative limits. Thus, a social network is comprised of potential normative and comparative reference organizations (Evans, 1966). As Haas and Drabek (1973: 273,283) point out the system of reference organizations can either sanction new normative expectations or reinforce old ones. In the latter case resistance to innovation should be found. In cases where new normative elements are acquired from the organizational reference system, strain is introduced (Haas and Drabek, 1973: 273). The strain may be resolved by innovations changing the organization to conform with current social network norms. This is precisely what appears to have happened in the two social networks that included police departments and fire departments. The social networks became mobilized with regard to the problems of controlling civil disturbances. Through a variety of interactive processes new normative expectations about what police and fire departments should be and do were created. But, these normative expectations are general and may not be applied to every organization, depending upon the perceived necessity of the changes for particular departments. However, it must be reemphasized that often the shifts in domain occurred in the apparent absence of rational need. Most important, while a theory built upon the findings of the present study would find normative shifts in domain a necessary condition for innovations develop-ing from a mobilized social network, they are not a sufficient condition. This is clearly seen in the contrast between the innovation patterns of fire departments and those of police. The latter were not only under the influence of normative changes, but also were the recipients of extensive

financial assistance to implement innovations. Fire departments were influenced by normative changes, but were not favored by heavy financial assistance. This influenced the scope and level of innovations greatly -- especially in cases where the innovations could be defined as being only of marginal utility. In contrast police departments did *adopt innovations* they admittedly considered of little use.

The sharp contrast between the disaster and civil disturbance organizations studied seems to point to two hypotheses concerning the relative efficacy of interorganizational networks in bringing about organizational innovation. Both of these are related to the character-istics of the interorganizational network that tend to be mobilized concerning organizational innovation. As we have mentioned, in the case of the possibility of civil disturbance, the interorganizational networks were national in scope. While for the four sets of natural disaster organizations, the interorganizational networks were always of only local scope. Obviously, the difference between a social problem of national scope and attention and one confined to a local area is especially important because of the much greater public resources available at the federal level of government. It is widely acknowledged that the federal government has a much greater capacity to locate resources to meet problems than do local governments. These financial resources were impressively mobilized in the face of the civil disturbance problem. Local communities after disaster are hard pressed to reestablish routine levels of organizational capability let alone provide for "frills" like innovations for the next disaster.

A second, more original observation can be made in contrasting the interorganizational networks mobilized for the two types of crisis innovations. Because the civil disturbance problem was national, the network included both normative and comparative reference organizations (Evans, 1966). However, local networks concerned with disaster provide only normative reference relationships for most organizations. Thus, organizations faced with the threat of civil disturbance found the problem salient at the same time other organizations of the same type did. Thus, for example, police departments copied heavily from each other in developing community relations programs. The police were provided not only with the impetus toward innovation by other types of organizations which encouraged or demanded that they relate more successfully to minority groups, but also they provided each other with models of how to define their problem and what sort of innovation would meet it. In contrast, a police department which has experienced severe disaster-response problems may encounter encouragement to innovate from normative reference organizations, but they will not find a network of other police departments for whom the problem is also salient at the same time. Thus, they are without the same sort of comparative reference models that so facilitated innovation in anticipation of civil disturbances.

This brings us to the final point about the nature of the conditions that we found associated with the patterns of innovation in this study. We have already argued these conditions tend to be normative and exogenous. They also appear to be episodic. That is, the conditions arise during a brief period of mobilization of an interorganizational network. Thus, they are not uniformly present. They are not structural (that is, enduring) conditions. Within the ruberic of current theories of organizations such episodes tend to be characterized as "historical" factors. Indeed, they are historical in the sense that they have occurred in the history of some organizations and not others. However, just because they are not permanent conditions and not experienced by all organizations does not mean they should be relegated into a residual status in theories of organizational innovation.

As might be imagined, the early case studies of organizations (for example, Selznick, 1949) depended heavily upon just such historical conditions to account for the patterns of organizational change they encountered. However, the recent trend toward comparative studies of large numbers of organizations has abandoned some of the insights the earlier case studies provided. Probably to the detriment of their theories, this study's conclusion that such episodes are of crucial importance is shared by some recent treatments of social change. Nisbet (1970) finds the weight of historical evidence is very much against the common assumptions that social change is an imminent and gradual unfolding under the constant pressure of uniform conditions. Rather, he argues that social change occurs in uneven spurts and is caused by conditions that are only occasionally present. Swanson (1971) takes a similar position and very usefully addresses the problem of the social characteristics and dynamics of such episodes. His conception of "transitional organizations" shows an important interface between theories of organization innovation and collective behavior.

Their theoretical discussions and our empirical patterns and interpretations indicate the importance of revising current theories of organizational innovation so as to capture the conditions and mechanisms of the redefinition of normative elements in organizational domains. Unless this is done, it becomes very hard to see how large-sample studies of formal organizational characteristics can have a great deal of success in verifying theories of organizational innovation. In this case, as in so much of contemporary sociology, our ability to statistically analyze data far exceeds our ability to fruitfully conceptualize and measure the elements and conditions we hope to find correlated. With this problem in mind, the next section briefly considers the types of research that could begin to attack the questions brought into focus by the present study.

Suggestions for Other Research

The findings of this study can be built upon and compared with other studies having similar research objectives. Studies with similar

substantive questions can be chosen to provide comparisons which were not possible with the data available for the present study. For example, almost all of the organizations included in this study are public. Many private organizations including businesses respond to natural disaster and civil disturbances. It would round out an area where data have not been systematically described to undertake a comparable study with these organizations. One advantage to a study with the same research questions and focus but with different populations of organizations might be to study the entire range of civil disturbance organizations for one or several communities.

In particular it seems that research designed to longitudinally trace the entire mobilization of a social network would be of exceptional benefit. In order to develop the conceptual and measurement tools required for systematic analysis of qualitative dimensions like organizational domains, the stigma now attached to organizational case studies should be removed. Case studies and intensive small sample studies are essential to develop the understanding and tools necessary for effective large sample studies. It is not only that one learns different things from different sorts of studies, but it appears that the lasting benefit of "comparative" (Udy, 1965; Blau, 1965; Heydebrand, 1967) studies of large samples will only follow the prior development of measures that capture the social foundations of organizations as systems of social action.

Conclusions

In this study we have explored the nature and conditions for organizational innovations in anticipation of crisis response. We have added a new dimension to the research tradition that this study carries on. The study describes the organizational nature of innovations anticipating crisis, providing a conception of the social nature of the phenomena we are attempting to explain. We have added the consideration of conditions for innovation not well discussed in the research tradition or the general literature. Especially, the study has raised the question of the role of organizations interacting in a social network of comparative and normative reference organizations as a pattern of society-wide change. In an increasingly organized and highly integrated society such episodes of change through the mobilization of social networks may be an increasingly common pattern.

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