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INNOVATION IN CRISIS RELEVANT ORGANIZATIONS:
A MODEL OF THE PROCESS OF ORGANIZATIONAL CHANGE

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By
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* * * * *

The Ohio State University
1971

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGMENTS</td>
<td>ii</td>
</tr>
<tr>
<td>ACKNOWLEDGMENTS</td>
<td>iv</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>viii</td>
</tr>
<tr>
<td><strong>Chapter</strong></td>
<td></td>
</tr>
<tr>
<td>I. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Background</td>
<td></td>
</tr>
<tr>
<td>Conceptual and Empirical Issues</td>
<td></td>
</tr>
<tr>
<td>Substantive and Theoretical Relevance</td>
<td></td>
</tr>
<tr>
<td>Nature of the Data</td>
<td></td>
</tr>
<tr>
<td>Outline of the Study</td>
<td></td>
</tr>
<tr>
<td>II. THE CONCEPTS WHICH UNDERLY THE MODEL</td>
<td>13</td>
</tr>
<tr>
<td>Organization</td>
<td></td>
</tr>
<tr>
<td>Organization-Environment Relationships</td>
<td></td>
</tr>
<tr>
<td>Objective Organizational Change</td>
<td></td>
</tr>
<tr>
<td>The Process of Organizational Change</td>
<td></td>
</tr>
<tr>
<td>III. A MODEL OF THE PROCESS OF CHANGE IN CRISIS</td>
<td>64</td>
</tr>
<tr>
<td>RELEVANT ORGANIZATIONS</td>
<td></td>
</tr>
<tr>
<td>Assumptions</td>
<td></td>
</tr>
<tr>
<td>Axioms</td>
<td></td>
</tr>
<tr>
<td>Basic Propositions</td>
<td></td>
</tr>
<tr>
<td>Derived Propositions</td>
<td></td>
</tr>
<tr>
<td>The Model</td>
<td></td>
</tr>
<tr>
<td>IV. METHODOLOGY</td>
<td>87</td>
</tr>
<tr>
<td>The Cases</td>
<td></td>
</tr>
<tr>
<td>Data Collection</td>
<td></td>
</tr>
<tr>
<td>Measurement of Variables</td>
<td></td>
</tr>
<tr>
<td>Chapter</td>
<td>Page</td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>V. THE EMPIRICAL EXAMINATION</td>
<td>119</td>
</tr>
<tr>
<td>Specification of Rankings</td>
<td></td>
</tr>
<tr>
<td>Correlation Analysis of the Data</td>
<td></td>
</tr>
<tr>
<td>Police Department Case Analyses</td>
<td></td>
</tr>
<tr>
<td>Fire Department Case Analyses</td>
<td></td>
</tr>
<tr>
<td>The Intelligence-Influence Hypothesis</td>
<td></td>
</tr>
<tr>
<td>Conclusion</td>
<td></td>
</tr>
<tr>
<td>VI. CONCLUSION</td>
<td>154</td>
</tr>
<tr>
<td>Expansion of the Theory</td>
<td></td>
</tr>
<tr>
<td>Future Verificational Research</td>
<td></td>
</tr>
<tr>
<td>Implications for the Continuing Analysis of Organizational Change</td>
<td></td>
</tr>
<tr>
<td>APPENDIX</td>
<td></td>
</tr>
<tr>
<td>A.</td>
<td>169</td>
</tr>
<tr>
<td>B.</td>
<td>171</td>
</tr>
<tr>
<td>C.</td>
<td>196</td>
</tr>
<tr>
<td>D.</td>
<td>199</td>
</tr>
<tr>
<td>E.</td>
<td>208</td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td>215</td>
</tr>
<tr>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>1. Organizational Variables</td>
<td>113</td>
</tr>
<tr>
<td>2. Specification of Organizational Rankings by Model Variables: Police Departments</td>
<td>121</td>
</tr>
<tr>
<td>3. Specification of Organizational Rankings by Model Variables: Fire Departments</td>
<td>122</td>
</tr>
<tr>
<td>4. Specification of Organizational Rankings by Structural Variables: Police Departments</td>
<td>123</td>
</tr>
<tr>
<td>5. Specification of Organizational Rankings by Structural Variables: Fire Departments</td>
<td>124</td>
</tr>
<tr>
<td>6. Correlation Analysis of the Model in Police Departments</td>
<td>125</td>
</tr>
<tr>
<td>7. Correlation Analysis of the Model in Fire Departments</td>
<td>126</td>
</tr>
<tr>
<td>8. Subjective Threat and Model Variables</td>
<td>127</td>
</tr>
<tr>
<td>9. Police Departments: Correlation Analysis of Model with Structural Variables</td>
<td>129</td>
</tr>
<tr>
<td>10. Fire Departments: Correlation Analysis of Model with Structural Variables</td>
<td>130</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

The objective of this study is to conceptualize and empirically examine the process of organizational change as an adaptive response to an uncertain and threatening environment. The internal processes of development of organizational adjustments and the role of environmental linkages to these processes are therefore important considerations. In order to meet this objective, it is necessary to draw out meaningful propositions to be addressed by data and then further elaborated. In this regard, the study develops a middle range theoretical model of change in crisis relevant organizations and then examines empirically and refines the model using data from a sample of urban police and fire departments in the United States. The model analyzes organizational adaptations to the problems posed by the threat or actual occurrence of civil disturbance. Change is conceptualized as an intelligence processing organizational activity, i.e., bringing technical and political information and/or knowledge to bear upon the definition and elaboration of organizational problems and the execution of attempted solutions to meet these problems. Viewing change in this manner provides an appropriate language to grasp the structure and process of change at the organizational level; bridging the gap between conceptions of the individual decision maker adopting changes, to the
emergent properties of organization as system undergoing patterned adaptations.

There are four central concepts which underly the change process model; these are organization, organization-environment relationships, objective organizational change, and the process of organizational change. The concept of organization is important because this is the sociological level of analysis of the research. Organization-environment relationships are important because the occurrence of civil disturbance is an extra-organizational, i.e., environmental impingement upon organizational affairs. Objective organizational change is the specific behavioral outcome the research will examine. Finally, the process of change, conceptualized as an intelligence processing organizational activity, is the pivotal analytical property of the model. As these conceptual abstractions are of substantial import to an understanding of model variables, the study will begin with a relatively detailed discussion and elaboration of them. This will be followed by the specific presentation of the model in deductive propositional form. The model propositionally relates the following six variables: environmental threat to organizational charter (posed by civil disturbance), organizational intelligence, organizational change, comparative reference linkage, range of organizational problem solving, and complexity of the process of organizational change.

The remainder of the study will concern the empirical examination and refinement of the model through comparative analysis of the cases. Included here will be a presentation of the methodology employed in the research phase, an enumeration of the empirical
findings, and a restatement of the model based upon the preceding empirical analysis. Each of the model variables will be measured in terms of a series of empirical indicators. In addition, several structural variables (size, wealth, professionalization, complexity, centralization, bureaucratization) will be measured and their impact upon the model assessed. The model will first be analyzed through correlation analysis and then several case illustrations will summarize the main findings of the research.

A few other points should be touched upon briefly in this introduction. First, some brief background information about the research will be provided. Second, the major conceptual and empirical problems to be addressed by this study will be spelled out. Third, the substantive and theoretical relevance of the research will be indicated. Fourth, the kinds of data to be employed for analysis will be briefly introduced. The introduction will conclude with an outline of the remainder of the study.

Background

The Watts riot and those that followed have had tremendous impact upon the contemporary American community. Civil disturbance has become defined as an urban problem of significant magnitude. Though the causal roots of the phenomenon represent much more than the ecological and social aspects of urban living, a civil disturbance event is a distinct community emergency -- an altered and uncertain state in the urban milieu. For certain community organizations such as police and fire departments, the problems emanating from civil disturbance fall directly within their
organizational domain. For example, the protection of life and property and the maintenance of law is their mandate, and it is these objectives which often become problematic during an emergency of this nature.

With the advent of civil disturbance in 1965, initial exploratory investigations in several American communities were made. These investigations indicated that police and fire departments had often made changes in such areas as planning, training, or emergency equipment as a response to the possibility or experience of civil disturbance. These organizational adjustments represented efforts to create standby mechanisms to meet the perceived demands posed by civil disturbance. In some cases change took the form of preparation for emergency response such as the procurement of safety equipment in fire departments or by the development of civil disturbance plans in police departments. In other cases, efforts were made in the area of prevention such as the establishment of community relations units and training. It also appeared that there were increased contacts between many of these organizations and police and fire agencies in other locales. Such factors as site visits, formal and informal exchanges of information, conferences, seminars, etc., were occurring. Knowledge about mutual problems and related programs was being transferred through these contacts. In addition, governmental funding in either the response or prevention areas often precipitated organizational changes. On the basis of factors such as these, it was decided to more systematically analyze the organizational processes involved in the identification of problem areas, the search for relevant information, and the development of
changes as an adaptive response to these identified problems. More generally, it was necessary to conceptualize the process of organization change under conditions of environmental uncertainty and the role environmental linkages played in the development of changes.

**Conceptual and Empirical Issues**

The change process model to be developed presents certain conceptual and empirical problems which will be considered by this study. First, an adequate conceptualization of organization is clearly required. Since organization is the conceptual and empirical focus of analysis, it must be defined and its component elements delineated. The organizational literature has been a great help in this regard and it is hoped that the perspective employed in this study will be a contribution to clarity. Second, an important and related issue is the conceptualization of the organizational environment, explicating the nature of important inter-relationships. An important substantive problem of this study will be the measurement of environmental threat posed by civil disturbance and the identification and measurement of relevant interorganizational relationships in the process of change. A third problem is an adequate delimitation of organizational innovation and its articulation with broader conceptualizations of organizational change. Furthermore, there is the empirical problem of measurement of change for the particular cases under analysis. Fourth, the model must tap those elements of the change process which are central. Thus the conceptual logic of model predictions must be convincing and the empirical examination must provide support for hypothesized relationships.
The objective of this study, once again, is to conceptualize and empirically examine the process of organizational change as an adaptive response to an uncertain and threatening environment. In so doing, attempts will be made to specify and elaborate propositions to be addressed by data. In the final analysis, the aim is to make some contribution to the theory of organizational change.

Substantive and Theoretical Relevance

The relevance of this research exists along basically two dimensions. The substantive area of study, i.e., organizational change as an adaptive response to the phenomenon of civil disturbance, represents an important aspect of contemporary American urban affairs. It is hoped that this analysis will describe and conceptualize what has evolved in these organizations under study, what changes have emerged and how they have been developed. The underlying problems of which civil disturbance is symptomatic are considerable and can be interpreted in many ways. No reflection about these issues will be made. However, it is felt that civil disturbance is a community emergency of sufficient magnitude to warrant substantial treatment of the problem of emergency response and prevention. It is hoped that this study will contribute to a better understanding of these problems.

In addition, the theoretical significance of this research merits attention. W. Richard Scott has pointed out that there is no widely accepted theory of organizations. Instead, there are a number of more or less developed conceptual schemes focusing upon various aspects of organization, certain empirical generalizations, several descriptive
case studies, and an extensive amount of prescriptive material. What has been generally absent are theoretical models which propositionally relate dimensions of organizational structure and process. The presentation of systems of hypotheses based upon lucid conceptualization of elements is a particularly important need in the literature. For this reason, the effort has been to develop a model of the process of change based upon research in crisis relevant organizations.

In developing a change process model, a number of important contributions can be made to the literature. First, the importance attached to research on change has been indicated so often as to be almost a cliche. And yet, adequate conceptualization of the phenomenon in the literature is generally lacking. Therefore, the effort is to partially fill a conceptual gap here by explicitly depicting an organizational change framework. It is hoped that the credence of this framework will be determined through comparative analysis of the cases. Second, some existing work in both decision making and the innovation adoption process will be used as the groundwork for the model of organizational change employed in this study. The adoption process literature has generally been individualistically oriented and, similarly, the decision making literature, though extensive, is often in need of empirical and conceptual work at the organizational level of analysis. Where individual and social psychological approaches have predominated in the past, the present study treats the process of change as a system alteration. Change is viewed here as an intelligence processing organizational activity in which information and/or knowledge is brought to bear in solving organizational problems. In this way the emergent
properties of organization as system undergoing patterned adaptation can be better understood. Third, the area of organization-environment linkages, or more specifically, interorganizational relationships, is beginning to attract considerable attention among organizational analysts.\textsuperscript{16} By incorporating this factor into the model as an intelligence resource, it is hoped that a contribution can be made to that growing body of literature.

In sum, this research attempts to examine organizational change in crisis relevant organizations; the internal processes of development of organizational adjustments and the role of environmental linkages to these processes. Particular attention will be paid to conceptual refinement of all relevant elements because this is essential for the development of theory. The hypotheses to be elaborated will be empirically examined in as systematic a fashion as the data allows.

**Nature of the Data**

A complete account of the methodology employed for analysis will be elaborated later in the text. By way of introduction, the study is based upon a population of police and fire departments in seventeen American cities. These cities are Columbus, Dayton, Toledo, Cincinnati, and Youngstown, Ohio; Louisville, Kentucky; Indianapolis, Indiana; Buffalo, New York; Miami, Florida; Oklahoma City, Oklahoma; Topeka, Kansas; Lubbock and Brownsville, Texas; New Orleans, Louisiana; Detroit, Michigan; St. Louis, Missouri; Los Angeles, California. The primary source of data is interviewing of organizational officials to obtain descriptive accounts of the changes that have occurred in response to
the threat of civil disturbance. Several different instruments will be used depending upon the respondent's position or area of knowledgeability. The substantive areas to be covered by interviewing are changes in policy, planning, training, and where existent, community relations programs. In each case attempts will be made to obtain information in the following areas: identification and measurement of environmental problems brought about by civil disturbance threat; description of any changes and the problems to which they were directed; identification of participants in the development of changes and the basis of their participation; measures of the existence and sources of intelligence utilized in the development of changes; insight into the structure of decision making and measures of the complexity of the process of change; measures of the relevance of environmental linkages to the development of organizational changes. Of course, each of these sets of measures will relate to variables included in the model. In addition, documentary information will be obtained about each organization as a basis for comparison. Data concerning structural dimensions such as size, wealth, professionalization, etc., will be obtained from organizational records.

Outline of the Study

The study will contain five additional chapters and a concluding appendix. Chapter II presents the main concepts which underlie the model and their elaboration. Reiterating, these concepts are organization, organization-environment relationships, objective organizational change, and the process of organizational change. Chapter III will
present the theoretical model. Assumptions and basic and derived propositions are delineated with appropriate discussion of their conceptual logic. Chapter IV will elaborate in some detail the data and the methodology employed for analysis. Included here will be a presentation of indicators used for the variables in the model and the reasons for their employment. Chapter V will present an empirical examination of the model. In systematic fashion supportive and negative findings will be presented and discussed. Chapter VI re-examines the model in toto, considers possible refinements and discusses some implications of the study. The concluding appendix contains the various instruments and other tools used in the research.
FOOTNOTES: Chapter I

1. Wilensky refers to intelligence as the technical and political knowledge utilized in decision making in organizations. The effort here is to view intelligence as an information or knowledge processing activity. See Harold Wilensky, *Organizational Intelligence* (New York: Basic Books, 1967).

2. For a detailed descriptive study of organizational response to civil disturbance, see George Wachter and E. R. Quarantelli, *An Analysis of Los Angeles Fire Department Operations During Watts*, Disaster Research Center Monograph Series (Columbus: Disaster Research Center, The Ohio State University, 1969).

3. Admittedly, racial disorders were not unprecedented in 1965. See for example, Stanley Lieberson and Arnold Silverman, "The Precipitants and Underlying Conditions of Race Riots," *American Sociological Review*, 30 (Dec. 1956): 887-898. However, with Watts an era of violent urban disorder began and has continued.

4. The present study emerged from the ongoing research of the Disaster Research Center. The Center had been studying organizational response to natural disaster. With the advent of civil disturbances, some preliminary investigations of the preparations and plans being made for this new contingency in several emergency relevant organizations were made. This was done in conjunction with an ongoing emphasis on natural disaster response.


6. There are several of these such as the work of Blau, Gouldner, Selznick, Perrow, Thompson, Etzioni and others. For a most recent example see Peter Blau, "A Formal Theory of Differentiation in Organizations," *American Sociological Review*, 35 (April 1970): 201-219.


9. The managerial literature has extensive amounts of this material. This has been the case historically since the emergence of the
factory system and the seminal work of Taylor. It is particularly evident in the classical and neo-classical approaches to administration.


CHAPTER II

THE CONCEPTS WHICH UNDERLY THE MODEL

A necessary pre-requisite for an understanding of the model to be presented in the next chapter is considerable conceptual groundwork. The purpose of this chapter, then, is to consider broad conceptual areas which underly the model, extrapolating from their treatment in the literature and definitively couching them in terms of the present study. There are four central concepts which underly the model; these are organization, organization-environment relationships, objective organizational change, and the process of organizational change. The chapter will be organized in terms of a discussion of each of these concepts, examining their treatment in the literature, where relevant, as a means of building to the specific definition and usage of them in the present study.

Organization

As organization is the conceptual and empirical focus of the model, it is necessary to clearly specify the definition and usage of the concept in this study. Organization will be defined as a purposive and open system of patterned activity which is structurally integrated to solve organizationally defined problems. As this definition is a product of various themes and underlying rationale in the literature,
some discussion of them is warranted. The resultant definition will reflect the sociological stance of the research and provide an orientation for the remainder of the study.

There have been several attempts to define or outline the field of organizational analysis as it has developed historically. In spite of the amorphous and diffuse state of the literature, a few general themes have been drawn out in the form of categoric distinctions between schools of thought. A gross simplification would suggest two major lines of development. The first of these can be labeled the managerial tradition and the second the Weberian structural tradition.

Subareas of the managerial tradition are scientific management (Taylorism), the formal theory of administration (Fayol), the human relations approaches (Mayo, Rothlisberger, Dickson, Warner), group dynamic views (Likert, Moreno), and the decision making perspective of Simon, Bernard, Cyert, March and others. Although these subareas are different in many ways, they are all essentially social-psychological in that the problem is to articulate human motivation with ongoing organizational activity. Until more recently, there has been little emphasis upon structural aspects of organization.

In the Weberian tradition, there has been a focus upon structural properties of organization, particularly the phenomenon of bureaucracy. Early theorists such as Weber and Michels had a predominantly macro orientation, whereas more contemporary research on bureaucracy has been of a more middle range and empirical nature as exemplified by the work of Selznick, Gouldner, Blau and others. Increasing emphasis in the measurement of structural variables by way of comparative analysis has
recently emerged. In this more sociological tradition, complex organizations are seen as unitary systems of collective action with discernible structural patterns. The primary distinction between organization and other forms of social grouping is generally expressed in terms of specificity of purpose and the complexity of behavior. Organizations themselves range along a continuum of relatively simple to complex patterns of human activity.

Despite the historical disparity between these two traditions, we should also be aware of certain similarities. This is illustrated by the noticeable convergence of interest in the literature. In developing a conceptualization of organization, some of these comparable points should be kept in mind. For example, both traditions view organization as a form of social grouping which is established in a purposive way for the attainment of relatively specific goal(s). Underlying this is the notion of rationality, i.e., the attempted actualization of some distinct end by means of a precise calculation of means. Rational administration is explicit in Weber and, in turn, the rationalization of work in its most extreme form is the essence of scientific management. As both traditions have developed the "pathos" of rationality has been debated and the analytical and empirical utility of the concept both questioned and refined.

A second comparable point is that both traditions have made the transition from a basically static equilibrium model of organization to more dynamic notions of systemic balance. In the managerial school, Bernard and Simon have clearly promoted this view by means of the concept of bounded or imperfect rationality. The use of this concept
was prompted by the recognition of the dynamic nature of organizational behavior and constraints posed by a fluid environment. Within the structural tradition writers such as Selznick, Gouldner, Blau, Etzioni, Parsons and others have elucidated notions of systemic openness and change as an adaptive response to a dynamic environment.

A third similarity is exemplified by a convergence toward organizational levels of analysis. The managerial tradition has evolved from atomistic Taylorism, to the work group focus of classical administration theory and human relations approaches, to a growing emphasis of decision making and neo-classical perspectives in the formal features of organization structure. From the macro analysis of its Weberian underpinnings, the structural school has moved to organizational levels by means of a growing concern with empirical rigor combined with the necessity of dealing with bureaucracy within a more manageable conceptual framework.

A fourth point of comparison is that both traditions contain a functionalist bias. Though a survival model has generally replaced a more purely rational model, the importance of functional integration has maintained itself in the field. For example, Parsons identifies four functional requisites for system survival. Thompson discusses several types of technological integration as a rational way of remaining flexible and adaptive to environmental requirements and fluctuations. Simon promotes satisficing as opposed to maximization of goals as a means of maintaining organizational equilibrium. Implicit here, at least in part, is the organismic analogy in which the interdependence of system components is central and the perpetuation of the total system is
dependent upon the smooth and integrated operation of parts.

A final point worth mentioning is that neither tradition has systematically dealt analytically or empirically with organizational conflict and power. However, some attention has recently been given to these considerations in the literature; namely, that dealing with militant professionalism\textsuperscript{15} and the examination of power in organizations as an important behavioral referent.\textsuperscript{16} This represents a new and interesting development and the ramifications of a conflict model of organization are just beginning to be elaborated in the field.\textsuperscript{17}

What can be said about the concept of organization from this admittedly brief historical excursion? Organization is essentially viewed as a problem solving social entity, which, as an open system, must control internal and environmental structures and processes in order to effectively meet organizational objectives. The imperfect nature of rationality is recognized; the dynamic nature of the environment is depicted; the importance of systemic adaptability and equilibrium are posited; and the organizational relevance of conflict and power is accepted. In general, the field has become more sociological in orientation. The recognition of the complex emergent properties of total organizations is one indication of this view. It also becomes very apparent that an adequate understanding of organization requires the identification and specification of its relevant dimensions in order to provide closure for theoretical refinement. Thus, in the discussion which follows, it will be necessary to define and delimit organization and its component elements.
For the purposes of this study, organization is defined as a purposive and open system of patterned activity which is structurally integrated to solve organizationally defined problems. Organizations are therefore considered as open systems, with relatively clearly defined objectives, in which different types of human behavior must be successfully integrated to form a problem solving whole. This definition incorporates much that has been characterized in the organizational literature, i.e., a bias toward rationality and functional integration, an underlying assumption of systemic openness, and a wholistic sociological interpretation of the phenomenon. It is also assumed, however, that rationality and structural integration are always imperfect. Taking this stance recognizes the arguments of Gouldner, Sjoberg, Cyert and March, Strauss and others, that interdependence between system parts is fluid and differentiation presents the possibility of strain and conflict. Furthermore, this definition allows for the fact that organizations vary in complexity and the degree of specificity of objectives. Admittedly the definition relates most directly to large more complex forms of organization, although cut off points are always arbitrary. However, it is felt that the definition can be applied to more simplistic forms of organization as well. The key point is that organization represents a patterned problem solving system of social behavior which can be identified as a unique element in its ecological and social environment.

In defining organization it is necessary to specify its basic components. As stated earlier, there has been a growing amount of empirical work in which efforts are made to measure organizational
variables. Thus indicators for size, bureaucratization, centralization, formalization, complexity, professionalization and others, have been developed and covariations analyzed. The rationale and assumptions behind these measures are in many cases left unspecified. A more difficult problem is the expression of these variables as dimensions of more abstract conceptual elements of organization. This must be done in order to maintain a coherent holistic perspective. The need becomes the presentation of inter-related constructs which subsume these variables. The variables, in their empirical measurement, examine the utility of the conceptual abstractions.  

The following are considered to be the major organizational constructs or system elements: (1) organizational charter, (2) resources and technology, (3) activities, (4) normative structure, (5) authority structure, (6) power structure, (7) status structure, (8) environmental relationships. Each of these will be defined briefly and then inter-relations shown.

1. Organizational Charter

The organizational charter is defined as the image of the organization maintained by both organizational actors as well as individuals, groups, and organizations which come into contact with it. Dimensions of charter include the name of the organization, its formal objectives and its relationship to the environment. Charter also includes policies which specify and legitimize goals as well as define rights and obligations of the organization and its members. Charter essentially distinguishes the organization as a unique part of the social and ecological
environment. It is somewhat analogous to the ideational and value elements of culture at the societal level of analysis.

2. **Resources and Technology**

The resources and technology of the organization include the actual or potential human, material, capital, intelligence, and natural resources, and techniques employed by the organization in its activities. These resources and techniques have implications for organizational structure because they specify relevant activities for their enactment, continuance or alteration. In effect, they delimit the actualization potential of organizational charter. Organizational wealth and physical resources are examples of material means. Levels of education, experience and training of organizational incumbents are good illustration of human resources. In more general fashion, we can also refer to the intelligence resource of the organization. This represents the existent level of technical and political information and/or knowledge which can be brought to bear in the solution of organizational problems. Intelligence is essentially an ideational resource and includes such factors as bodies of data and other forms of organized knowledge, the expertise of organization members, standby mechanisms for handling problems, and awareness of extra-organizational intelligence sources.

3. **Activities**

The activities of an organization are the ongoing differentiated behaviors which actualize charter objectives. The integration of these activities preserve the organization as a unique entity. All
organizational behavior is included under this dimension and its degree of complexity is an important variable. Change will be discussed later as an intelligence processing organizational activity. Variation in the complexity of this activity is an important consideration and will be incorporated in the model.

4. **Normative Structure**

The normative structure is composed of prescribed and proscribed rules for behavior and indicates required and permissible forms of interaction between positions or individuals. The norms are both official and unofficial in nature. The official normative structure refers to those patterns of norms related to specific positions in the organization. An important variable here is the degree of formalization of official rules. The unofficial norms refer to both the positions and the people who occupy them. Embedded in this unofficial structure are patterns of interpersonal relations. This refers to the sets of person to person orientations that develop among organizational members and groups independent of specified relationships. The previously discussed dimension, organization activities, are permeated by the normative structure. For example, output and control activities contain directive, evaluative, coordinative, and sanctioning aspects which are all normative. In similar fashion, work group relations and influences contain a built in normative structure.

5. **Authority Structure**

The authority structure is the pattern of authority relations.
within the organization. Authority is formal and institutionalized power and its basis is in the office or position. Major dimensions of the authority structure (such as degrees of bureaucratization and centralization) have been examined in the literature and these have been related to such factors as size, level of professionalization, specialization, effectiveness, etc. Thus authority has been deemed an important concept for analysis.

6. **Power Structure**

The power structure is the pattern of power relations within an organization. Power is the ability of an organizational unit to actualize its interests, whether consciously or unconsciously, within the context of asymmetrical relationships, thereby affecting the activities in the organization. In other words, power takes place in interaction between organizational incumbents and components. As mentioned earlier, systematic investigations of the role of power in organizations is at an incipient level of development. A key methodological problem is one of measurement. In any event the relevance of the concept is recognized and its relatedness to other dimensions is extensive. For example, Wilensky's work on labor unions indicates the relationship between levels of intelligence of organizational incumbents and influence in organizational decision making. Another example is the rather elaborate relationships between the power, status, authority, and normative structure. Power relations are intergroup as well as interpersonal properties of interaction. Structural integration is maintained, in part, by these operant dimensions as well as the
interdependence of organizational activity.

7. **Status Structure**

The status structure includes the patterns of differential status in the organization. Status is the differential assignment of members of the organization on scales pertaining to such factors as prestige, expertise, competence, power, authority, respect, popularity, etc. Status may be ascribed to the office or achieved in the form of advancement, promotion or reward. Of course, the status structure is related to the authority, normative, and power structures of the organization. In fact these all may be viewed as elements of a general system of stratification. 32

8. **Environmental Relationships**

Lastly, the conception of organization includes the important dimensions of environmental relationships. An organization's environment is the sum product of its linkages with individuals, groups, publics, other organizations, and the physical setting. Because of the direct inclusion of this concept in the change process model presented in Chapter III, a separate section of the present chapter is devoted to its treatment in the literature and its projected use in this study. It is merely indicated at this point that organizations are often affected by environmental structures and processes. For example, the organization exchanges products, services, information, and resources with other organizations and social units in its environment. As the environment is dynamic rather than static, the
organization must adjust to those changing conditions which affect its operations. In reciprocal fashion, the organization, as an integral part of the environment, may affect that environment through its activities.

The inter-relations among organizational elements has been implied or indicated at various points in the preceding discussion. For example, charter is actualized through organizational activities. Charter specifies, at least partly, authority relationships and the official normative structure. Resources and technology are defined as requisite by charter and, in turn, specify activity processes, influence power and authority relationships, and delimit goal attainment. The normative structure pervades organizational activity. The environment represents a source of material and human resources for organizational performance. It also presents a variable but continuing source of uncertainty. And so on. The point is that organization, as a problem solving system with discernible analytical boundaries, has the above dimensions. These dimensions provide a way of discerning the complexity of organizational behavior.

**Organization-Environment Relationships**

Organization-environment relationships are defined as the sum product of an organization's linkages with individuals, groups, publics, other organizations, and the physical setting. Environmental relationships are particularly important for this study because the occurrence of civil disturbance is an extra-organizational, i.e., environmental impingement upon organizational affairs. Therefore, the primary theme
of the following discussion is the recognition of the impact of environment upon internal organizational activities. In referring briefly to the literature, this central focus should be kept in mind. In addition, although much of the literature concerns inter-organizational relationships, this is but one (though major) aspect of the more inclusive concept, organization-environment relationships. Conceptual and empirical work will be distinguished as much as possible for purposes of dividing and summarizing the field. On this basis, those points considered of particular relevance to the problems of this study will be elaborated.

There have been several conceptual treatments of the phenomenon which merit summarization. Among these are the works of Evan, Guetzkow, Levine and White, Thompson, McEwen, Quarantelli and Dynes, and others. In each case, the authors have indicated general definitions or substantive discussions which illustrate conceptual abstractions.

Evan employs the concept of organization set (analogous to Merton's role set) in which organization is the unit of analysis; interacting in a field of other organizations. Just as Merton had suggested, there is the possibility of any focal organization having conflicting demands within environmental sets. Evan also suggests mechanisms by which interaction between set members may be mediated. Included here are role sets of boundary personnel and the flow of information, products and services. Of major import is the assertion of the utility of the concept in explaining such factors as the degree of autonomy in organizational decision making, internal organizational structure, extra-organizational contingencies (conflict, competition, etc.) and the degree of effectiveness in goal attainment. Thus the possibility
of a dynamic organizational environment is clearly understood as well as its consequences for organizational functioning. Finally, Evan discusses possible distinguishing characteristics of organization sets. The concept of comparative and normative reference linkages is of particular importance to this study. Comparative reference sets are those in which members are similar organizations such as contacts between police departments. With similar objectives and structures, these organizations have a basis for comparison of output, problems and needs. They may in fact be in competition for scarce resources. In a normative reference situation, the focal organization accepts goals of certain elements in its set(s). The mandate that police departments have from local government is an example of this type. Normative and comparative reference linkages can be subsumed under the broader concept of social network. Social networks refer to functionally specialized organizations and other social units which are inter-related in terms of their concern with a common set of objectives or activities. For example, a law enforcement network including local, state and national police agencies, the courts, and various other governmental agencies might be identified. The importance of certain of these linkages will become more clear in the presentation of the model.

Guetzkow, in a rather comprehensive discussion of the concept of interorganizational relationships, characterizes classes of interaction, modes and media of interaction, and of particular interest to this research, the substantive forms that these relationships may take. He argues that autonomy versus interdependency is the key distinguishing factor. The former entails minimal organizational interaction.
The latter includes cooperation, interference, facilitation, and possible admixtures of each. Guetzkow concludes, as does Evan, that interorganizational relationships have pronounced and varied implications for organizational processes.

Levine and White propose an exchange framework in their analysis of community health and welfare organizations. Their emphasis is clear as they define exchange as any voluntary activity between two organizations which has consequences, actual or anticipated, for the realization of their respective objectives. Interestingly enough, they point out that exchange need not be reciprocal, i.e., it may be unilateral and yet the respective goals of the two organizations are still furthered by the interaction. For example, if patients are transferred from an overloaded and understaffed hospital to one which has available facilities, the objectives of both organizations are being met even though the exchange was not directly reciprocal. The key point here is the link between environmental relationships and goal attainment.

Thompson has given considerable attention to the relations between an organization and its environment. For example, in Organizations in Action he develops a plethora of propositions based upon the assertion that organizations operating under norms of rationality adapt to and attempt to control environmental uncertainty. In another work, he looks at organizational output roles as boundary spanning; linking organization and environment through interaction between member and non-member. The transaction structure and the typology he suggests is based upon the degree of specificity of organizational
control on the environment. In an article with McEwen, Thompson suggests that goal setting is essentially a problem of defining desired relationships between an organization and its environment. Here again, he argues that you can order the forms of interaction in terms of the degree to which they provide for organizational control. Thus, as one moves from competition to bargaining to cooptation, to coalition, organizational influence on the environment increases, but it may be reciprocal. Finally, Thompson argues that the more unstable or complex the environment becomes, the greater the possibility of goal alteration through some linkages. In like fashion, Emery and Trist as well as Terreberry see the dynamic nature of environment as inducing change in various aspects of organizational behavior. They suggest that research and conceptual efforts be directed at ferreting out this complexity.

Dynes and Quarantelli apply conceptions of interorganizational relationships to their research on natural disasters. They suggest that during emergencies interorganizational relationships become evident since the nature of the tasks created by the disaster event requires intense activities on the part of many different organizations, even those having minimum previous contact. In effect, they argue that dynamic forms of interdependence emerge as a result of the disaster agent.

Finally, cybernetic analyses with open system premises, view organizational behavior and change as an adjustment process to a fluid environment. The mediating mechanism for environmental linkage is usually referred to as the interface; system sensors monitor the
environment and the organization makes appropriate adjustments on the basis of a priori goals.

As can be seen from the above summary of the conceptual literature, the area of organization-environment relationships is a relatively new one. There is a general recognition of the importance of this dimension and a groping for precise conceptual tools to somehow delimit key aspects and provide an appropriate language for its analysis. Related to these conceptual efforts have been several empirical studies which have either examined a specific area or attempted to measure more precisely various aspects of the concept. The following illustrates some of the empirical work being undertaken.

Some relevant research on interorganizational relationships has been done by Aiken and Magee in their analysis of organizational interdependence in sixteen welfare agencies. In examining the relationship between joint cooperative programs and certain organizational characteristics, they found that organizations with many joint programs were more complex, professionalized, and had more diversified occupational structures. These organizations were also more innovative, had more active internal communication channels, and slightly more decentralized decision making structures. The data suggest that high interdependence has important implications for the internal structure of the organization.

Organizational interdependence has been referred to in many ways. For example, Black and Case, in their study of inter-agency interaction in the mental health field, refer to functional cooperation; while Reid, in his analysis of inter-agency efforts of delinquency
prevention and control, refers to program coordination. In any event, as organizational interdependence increases, decision making can be influenced in a variety of directions depending upon the nature and intensity of the linkage.

Dill's study of two Norwegian firms shows how the autonomy of managerial personnel is influenced by the structure of the environment; in this case by the accessibility of information about the environment and managerial perceptions about the meaning of this information. He suggests that by viewing the environment as a flow of information to organizational incumbents, it is possible to make systematic comparisons of the environment of different organizations and particular managers on the basis of accessibility to information and reactions toward it.

Elling and Habesky assume that organizations depend upon environmental resources for goal attainment. They argue that, to some degree, organizations with similar goals compete for these resources. Pursuing this position, they compared the degree of support between local government hospitals and voluntary hospitals, and found that the latter received considerably more. While imputing the notion of competition for scarce resources, they suggest that the main differentiating factor was sponsorship. In effect sponsorship connects hospitals to various segments of the community which can offer varying amounts of support.

Lytwak and Hilton look at the role of coordinating agencies (community chests, manufacturers associations, etc.) in which organizations are partially interdependent, i.e., they are under simultaneous conditions of cooperation and competition. They argue, with empirical
support, that as long as organizations are at least partially interdependent and aware of it, coordinating agencies will develop and continue in existence. Their function is to rigorously specify these areas of interdependence. Thus private manufacturers look to business associations to protect their mutual interests while they compete for customers.

Various measures or possible indicators of organization-environment relationships have been put forward in much of the previously discussed research. The following two articles by Anderson and Finley present different but systematic methodological techniques for measuring interorganizational contacts. These works are cited because they were of heuristic value in the measurement of certain model variables.

Anderson attempted to use sociometric techniques in his analysis of the phenomenon. The measures depicted dependency or independence among the organizations studied. Anderson's specific research goal was to identify organizations responsible for economic development of certain county regions of Michigan. A reputational approach was used to identify influential organizations. On this basis he attempted to determine blocks or sets of influential organizations. Anderson then argued that a coalition analysis based upon configuration of sets is possible. He concludes that the sociometric method has fruitful results for an understanding of cooperation, competition, and conflict among organizations in a regional setting.

Finley tried to determine if various types of interactions, from such diverse relations as informal exchanges of information to joint
action, would scale in some cumulative way from very low to high intensity of contact. In two separate empirical tests, he found that 12 of 21 (57 percent) and 12 of 15 (80 percent) of the items scaled. The important point here is that Finley's scales measure not only frequency of contact, but also a more detailed specification of the content of the interaction.

There are essentially six considerations or themes in the preceding discussion which are directly relevant to the present study. First, organization-environment relationships represent one aspect of organizational activity, or as Thompson refers to it, organizational action. Therefore, specification of these relationships is necessary to complete understanding of organizational behavior. Second, the environment represents a dynamic configuration of other organizations, publics, individuals, and the ecological setting. Thus, the environment is a fluid and in some measure uncertain situational field. Third, as rational systems, organizations attempt to minimize environmental uncertainty when it impinges upon charter. When charter is threatened by uncertainty, organizations often adapt in the form of mechanisms established to either remove or mitigate its impact. Fourth, the organization may not have sufficient information, knowledge, or other resources necessary to make appropriate adjustments; it therefore requires inputs from environmental sources. Fifth, all environmental inputs and relationships become articulated through varied and complex mediating mechanisms. These include interorganizational relationships, relations with other social units, or direct links to the physical environment. As has been shown, these linkages
may be cooperative, coordinative, facilitating, competitive, conflict-
ual, bargaining, or some combination of these. They may involve
exchanges of information, resources, or services on the one hand, or
they may be of a ideological, physical, or violent nature. Finally,
organization-environment relationships have rather distinct struc-
tural consequences, e.g., from autonomy to coalition. The linkage
itself may be direct such as communicative interaction, or indirect,
such as through public information, mass media, etc. Particular organi-
zational input points can be conceived of as boundary spanning features
of the organization. In some cases these may be officially specified
boundary roles; in another sense, all organizational incumbents are
boundary spanning positions, i.e., they are possible input and output
links with the environment.

The present study analyzes police and fire department adaptation
to the possibility of civil disturbance. In this case environmental
uncertainty is a clear threat to charter. In many instances these
organizations have adjusted by creating mechanisms such as emergency
plans to deal with this organizational problem. In doing so they have
often required intelligence inputs from the environment such as know-
ledge of other police and fire department activity and resources in
the area. Thus the environment is both a threat to charter on the
one hand, and a source of inputs to mitigate that threat on the other.
One goal of this research, therefore, is to conceptualize and measure
environmental uncertainty and then relate it to the process and
objective product of organization change. A further effort will be
to elaborate and measure the importance of specific linkages, such
as comparative reference relationships, to the process of change. The theoretical model to be presented in Chapter III incorporates the above considerations and the review of the literature has been instructive to this effort.

**Objective Organizational Change**

The remaining two conceptual areas could be subsumed under one rubric, i.e., organizational change. However, since the model views change as both a behavioral product and a process, the presentation is divided into two parts. The first briefly defines organizational change as a general sociological concept. The second elaborates, in some detail, the perspective of the actual process of change used in this study. This represents the final conceptual groundwork for the theoretical model to follow.

Organizational change will be defined as a relatively permanent alteration in the internal elements or external environmental relationships of an organization resulting from the effect of a change agent, within a specific space-time context. As objective change is the specific behavioral outcome examined by the research, a clarification of its usage is needed.

Analysis of organizational change is not well developed in the sense of clearly explicated and tested propositions about the phenomenon. As change is relatively difficult to apprehend both conceptually and empirically, its analysis is not particularly well defined and delimited. Although there have been a variety of discussions and observations about change, it generally appears to have been a
A byproduct rather than a specific focus of much research.

The general concept of social change is as old as the discipline of sociology and it is presently given some reference in most areas of the field. In the subarea of organizational analysis, notions of system change are perhaps most relevant. For example, Moore discusses the following possible sources of system change: adaptation to external events, flexibilities in the system, and strains inherent in the system. Loomis suggests that system linkages are the key to any analysis of change. Parsons distinguishes between exogenous (other system) and endogenous (strains, incompatibilities of system parts) sources of change. He suggests that the impact of a change agent upon the structural components of a system is variable according to the magnitude of the agent, proportion of units affected, and the strategic nature of these units. In a related fashion, Sjöberg suggests that contradictory functional requirements inferred from contradictory structural arrangements may initiate both conflict and change as these arrangements may be essential to system operation. This tacit dialectical view of change is similar to that explicitly expressed by Blau and Scott. In similar dialectical fashion, Dahrendorf and other conflict theorists, drawing from Marx, view change as a product of struggles for social power. In an interesting article, Burns suggests that routine substitutes serve as replacement for interpretive action in social systems. He then argues that social change results from the failure of routine substitutes to replicate those aspects of the social situation to which they refer. Thus the social unit is forced to revert back to spontaneous interpretive action in order
to control the environment and new routine substitutes are created. Finally, Calvillador proposes a cybernetic analysis of change because, as he suggests, this is basic to the underlying assumption of the general systems model.

The notion of purposive or planned change has been popular in the managerial tradition of organizational analysis. Writers such as Bennis, Leavitt, Coch and French, Lawrence and others, have dealt with this area specifically. Much of the literature is of a prescriptive nature as the relationship between styles of leadership or types of management and the effective implementation of change is examined. The orientation is generally social psychological, i.e., the fusing of incumbent motivation and behavior with organizational goal structures. In other words, the crux of many of these studies and arguments is the relationship between individual fulfillment and organizational problem solving and productivity.

There have been relatively few systematic empirical studies of organization change which are primarily sociological. However, the following three studies appear to be fairly representative examples. Hage and Aiken develop aggregate empirical indicators of the organizational properties of complexity, centralization, formalization, and morale and relate them to the adoption of new programs and services in sixteen welfare agencies. They found that a high degree of participation in agency decisions, a low degree of job codification and high morale were associated with a high rate of program change. These relationships remained when size, auspices, age of organization and function were controlled.
Tsouderos suggested that organization change could be empirically observed through the growth of a number of selected variables. Quantitative variables are related to the growth of ten voluntary associations. Functional relationships are determined between growth of membership, income, administrative expenditures, property, and number of staff workers. On this basis he concludes that a cycle of growth and a cycle of formalization overlap.

There have also been some case studies of organization change. By way of illustration, McCleary undertook an empirical study of change in authority patterns in a prison system. The structural alteration represented a shift from authoritarian to liberal control via a change in prison management. McCleary provides a detailed analysis of the transition period, and the mechanisms of transformation such as personnel turnover, redefinition of power relationships, changing communication networks and processes, and an alteration of organizational goals.

The cursory review above by no means exhausts the work being done in the field of organization change. However, it illustrates the various kinds of efforts being made by indicating certain conceptual and empirical foci. Conceptually the problem has been one of identifying sources of change or specifying situations in which change can effectively take place. Empirically the effort has been to systematically analyze particular cases during some time period; or attempts are made to quantify organizational variables which may change. A key problem appears to be conceptual clarity. In other words a more precise formulation of the concept is needed as well as some
indication of its dimensions. It is hoped that the following discussion moves in that direction.

Once again, organizational change is defined as a relatively permanent alteration of the internal elements or external environmental relationships of an organization resulting from the effect of a change agent, within a specific space-time context.\textsuperscript{71} There are several comments in order concerning this definition.

First, although change is couched in organizational terms, it is felt that the conception can be applied to social units of varying degrees of complexity and goal specificity. Second, alterations can occur within an organization which may or may not be concomitant with changes in environmental relationships and vice versa. For example, an organization may change the time of its morning coffee break (a change in the normative structure) without having any effect on its relationships with other organizations. While the example is rather simplistic, it does illustrate the principle that alterations in the internal and external conditions of an organization are not necessarily inter-related. Third, change agents can be grouped into one of three classes: an event, a social act, or a social process.\textsuperscript{72} Thus a change agent may vary from an innocuous pronouncement to a complex process of occurrences.

Fourth, whether or not change has occurred is contingent upon the degree of alteration and the space-time context specified. In the final analysis this decision resides with the investigator who must clearly indicate (1) an organizational unit of analysis, (2) a space-time context, (3) some judgment as to the degree of alteration.
An alteration that is considered a change in one space-time context may be only a fluctuation, i.e., a relatively impermanent alteration, in another. For example, a positional promotion may be considered a change if one views a few months of the organization's life. If one establishes the entire history of the organization as the space-time context, however, the investigator may decide that this promotion does not constitute change.

Fifth, a crucial consideration is what specifically can change; in other words what organizational dimensions can undergo alteration. The previously defined dimensions of organization are quite logically the variables of organizational change. Reiterating, these are (1) organizational charter, (2) resources and technology, (3) activities, (4) normative structure, (5) authority structure, (6) power structure, (7) status structure, (8) environmental relationships. These variables answer the question, "What can change?" In any empirical analysis of organizational change the connections between measures and these organizational elements must clearly and logically be shown. For example, McCleary's study deals with the alteration of the authority and power structure at the very least. Tsouderos deals with resource and technology measures. Hage and Aiken's research treats the relationship between change in organizational activity (program change) and dimensions of the authority and normative structures of sixteen welfare organizations. In the present research on change in police and fire departments, the measures of change will be incorporated within these conceptual abstractions.
It is customary to consider these eight dimensions as dependent change variables. However, they are considered only as variables, because they can be both dependent and independent. In essence change in any of these dimensions may lead to changes in others in a very dynamic, reactive way. Therefore what is an independent or dependent variable is highly bound by the particular space-time context employed by the researcher.

Finally, in the present research, the changes made were formally instituted adaptations. Hence, they can be referred to as planned changes or organizational innovations; either reference is adequate. Bear in mind, however, that change can result from many factors other than rational decision. For example human and material losses brought about by an explosion represents a substantial change in organizational resources that was neither planned or anticipated.

This completes the discussion and elaboration of the concept of organizational change. The final section of this chapter presents the perspective of the process of change which will be used in the remainder of this study.

The Process of Organizational Change

In this study, the process of change is viewed as an intelligence processing organizational activity, thus directly linking change with the concept of organization. Essentially two areas of the literature have been helpful in developing this conceptualization. First, even though the decision making literature is primarily social psychological, it provides insights for organizational levels of
analysis. Of particular interest will be decision making under conditions of uncertainty because of its direct relevance to organizational behavior in response to the uncertainty and threat posed by civil disturbance. The notion of informational search behavior will be very important in this regard. A second area can be labeled as studies of innovation. Discussions of the adoption process are relevant because of the concern for information search. Also important are studies of the diffusion of innovation through some social structure because they indicate the impact of environmental relationships for organizational processes of change. This of course fits quite well with the earlier discussion of organization-environment relationships. As in the case of decision making literature, innovation studies are not generally organizational, this being a main criticism of both. The goal is to develop a conceptualization of the process of change which is distinctly organizational, i.e., more sociological in its enumeration.

In summarizing some of the work that has been done, the importance attached to information and other types of potential knowledge, and their sources, in the process of decision making and innovation should be noted. This factor is pivotal to the notion of intelligence processing organizational activities. Thus the literature will be used to build to the discussion of intelligence processing because of its analytical import to the model.

Taylor suggests that there are three basic models of decision making in the literature. The first concerns decision making under conditions of certainty. In this case alternatives are known as well as outcomes. This is, of course, representative of classic economic
man models which assume complete information and perfect rationality. The second perspective concerns decision making under conditions of risk. In this case all alternatives are known and outcomes are expressed in terms of possible sets which are probabilistically known. This, in effect, is the basic principle of game theory and is generally expressed in terms of a mathematical model. The third perspective concerns decision making under conditions of uncertainty. In this case the probabilities of both alternatives and specific outcomes are imperfectly known. Perhaps the most characteristic work here is that of Simon.

Simon posits the importance of an adequate understanding of decision making for any theory of administration, but he rejects classic notions of economic man. A key concept he employs is "bounded rationality", i.e., rationality in terms of limited knowledge of alternatives and consequences. In other words, rationality reflects the selection of behavioral alternatives which can be evaluated in terms of a system of values (value premises). A decision is rational to the extent that it is oriented to organizational goals. However, there are always limits to rationality such as incomplete data about known alternatives, value premises which are imperfectly defined, and the impossibility of knowing and considering all alternatives. Simon also points out that the organization's environment inevitably is a source of rationality limitation. By constructing the alternatives that are available, it sets levels to goal attainment. In the final analysis, organizational behavior becomes a network of decisional processes which are based upon both factual and value premises. Both are imperfectly
articulated in internal and environmental processes; thus the organization is confronted with varying degrees of uncertainty.

The concept of imperfect or bounded rationality has been picked up and elaborated in various ways in the literature. For example, the works of Gross, Shubik, Edwards, and Haberstroh exemplify mathematical approaches to decision making. These authors posit the importance of probabilistic statistics, computer simulations, and general systems analysis to decision making under conditions of uncertainty. Of particular interest to this study, however, is the work of Thompson whose focus is more distinctly organizational. Thompson defines generalized uncertainty as the lack of cause/effect understanding of organizational activity and the culture at large. Therefore, organizational technologies and environments are sources of uncertainty. Environment presents uncertainty in that outcomes of action are in part affected by actions of environmental elements. Technology is an internal source brought about by the interdependence of organizational components.

Thus Thompson views organizations as problem solving social entities and focuses upon processes related to adjustment to an indeterminant environment. His concern is how organizations approach certainty at their technical core in a fluid task environment. As the task environment changes the organization will attempt to modify technologies and structures in order to maintain the actualization of its objectives. In turn the organization will attempt to exert control upon as many elements of its task environment as possible so as to minimize uncertainty. Consequently, questions of definition of
domain, environmental monitoring, acquisition and maintenance of needed resources, and strategies of organizational action are germane considerations.

In terms of the present research, police and fire departments were confronted by environmental uncertainty brought about by the threat of civil disturbance. In many cases, performance of organizational activities required the development of new strategies and techniques. As Thompson would suggest, coping with uncertainty became a fundamental problem for these organizations.

A directly related concept to this discussion is that of organizational learning. For example, Cyert and March suggest five basic elements in their conception of learning:

1. Preferences: Desired states of affairs.
2. External shocks: Disturbances that can not be forecast or reliably prevented.
4. Imperfect control outcomes: Each new state is a joint outcome of internal control decisions and external shocks.
5. Change Processes: If a decision leads to a preferred state it is likely to be used again.

This is basically a statement of organizational adaptation. As standby mechanisms are successfully implemented to meet external contingencies, they become aspects of organizational routines. On the basis of the decision making literature, Hirschman and Lindbloom suggest that organizational learning seldom occurs where goals are known a priori. In effect goals change as an integral aspect of decisional
Learning occurs in response to immediate problems in various realms of organizational affairs, internal or environmental, and is primarily piecemeal. Environmental complexity, incomplete knowledge, and uncertainty about the future contribute to the piecemeal fashion in which learning occurs.

The remaining two works to be discussed provide an excellent transition from the decision making to the innovation literature because they suggest that the process through which organizations innovate or change is a decisional one. It involves developing adaptive mechanisms to meet uncertainty and is therefore a problem solving enterprise. These writers further show the importance of the acquisition of relevant knowledge as an essential component of planned change.

March and Simon\textsuperscript{87} point to planning and innovation as a problem reduction activity. The type of problem and past experiences are relevant concerns, as well as the resources brought to bear in developing changes. The costs of innovation, the search and screening of data, and the processes of evaluation and testing are central decisional components. Aiken and Hage\textsuperscript{88} distinguish between the dynamic changing organization and the static organization.\textsuperscript{89} The former is characterized by high complexity, low stratification, low formalization, emphasis on quality rather than volume, and high job satisfaction; the latter reflects the opposite. They add that the type of environment, i.e., stable versus reactive, may affect the style of organization. Finally, they suggest four stages to the process of change which include: the assessment of some need, initiation, implementation, and routinization. As will be seen shortly, these are somewhat similar to the stages of
the adoption process presented in the innovation material.

The importance of uncertainty in decision making was suggested at the outset of this review. Uncertainty was articulated from problem definition, to delineation of alternatives, to actual selection of alternatives. It was also shown to be both internally and environmentally generated. The importance of the acquisition and use of knowledge in each of these same areas of decision making as a means of mitigating or removing this uncertainty was also suggested. The relevance of this factor is explicit in most conceptions of decision making as illustrated by both qualitative and quantitative interpretations of the phenomenon. Third, the literature is generally expressed in terms of the individual decision maker, confronted by problems and selecting courses of action on the basis of varying amounts of data to reach or maintain some objective(s). In highlighting the innovation literature (particularly the adoption process) notice that this basic theme is apparent there as well.

Rogers' published review of the innovation literature abstracts from various studies in terms of lucid definitions of the phenomenon. He uses these definitions reciprocally to pigeon hole different research. His conceptualization merits some attention because of its explication of relevant aspects of innovation. There are two inter-related processes which Rogers addresses and they will be discussed separately. These are the diffusion of innovation and the process of adoption.

Rogers suggests that diffusion is the process by which an innovation spreads from its source or invention to its adoptors. He contends that there are four elements in this process: (1) the innovation,
(2) its communication, (3) in a social system, (4) over time. In slightly more elaborate fashion Katz defines the diffusion process as the (1) acceptance, (2) over time, (3) of some specific idea or practice, (4) by individuals, groups, or other adopting units, (5) linked to specific channels of communication, (6) to a social structure, and (7) to a system of values or culture. Of particular interest to this study is the notion of linkage to an encompassing social structure.

As adopters of an innovation, social units have that idea or practice defined and evaluated in some measure through informational and influence sources in the social system. This may occur through comparative reference relationships or a variety of other network linkages. A large number of empirical studies have examined this dimension. (These have been reviewed quite well by both Rogers and Katz.) Coleman's medical innovation study is perhaps most illustrative of this point. Coleman found that for individual doctors, the greater the involvement in the medical community, (e.g., personal ties, professional integration) the greater the likelihood of, in this case, the early adoption of a new drug. Furthermore, in assessing the importance of informational sources, he found that social media rather than impersonal professional media (journals, publications, etc.) were more important for doctors adopting the new drug.

The remaining conceptual area is the process of adoption. Rogers contends that there are five stages to the adoption process, i.e., awareness, interest, evaluation, trial, and adoption. Awareness represents perception but incomplete information about the innovation.
Additional information is sought during the interest stage. Evaluation entails the acceptance of risks and the decision to try the innovation. During the trial stage the innovation is attempted on a small scale to determine its utility. Adoption represents the decision to continue full use of the innovation. Rogers argues that the innovation may be rejected at any stage of the adoption process. There is also the possibility of continued evaluation after adoption or the chance that stages would be skipped completely. In sum, the adoption process is viewed as one form of decision making.

Rogers clearly indicates the importance of information and its sources at various stages of the adoption process. For example, he suggests that impersonal sources are most important at the awareness stage and personal sources at the evaluation stage; the latter allows for exchange of ideas and influence as well as information transferral.

The adoption period refers to the length of time passage from awareness to adoption. Rogers argues that awareness occurs at a much more rapid rate than adoption. His main thrust, however, is to distinguish between adoptor categories on the basis of length of adoption period. For example, he hypothesizes that the trial to adoption period is longer for earlier adoptors because of greater risk considerations. Pursuing this logic, earlier adoptors would tend to try innovations on a smaller scale than late adoptors.

Finally, the characteristics of the innovation itself affect the rate of adoption. Thus its relative advantage, its compatability with extant structures and processes, its complexity, communicability, divisability, etc., are all relevant factors. And all of these
features are affected by the magnitude of the problem toward which they are directed. For example, under threat or stress, the relative advantage of the innovation would tend to be increased.

By way of summary of the entire discussion, decision making under conditions of uncertainty is a problem solving enterprise in which the impact of information and other knowledge is expressed in terms of (1) knowledge of alternatives, and (2) knowledge of outcomes. Given the assumption of rationality, organizations will attempt to reduce uncertainty in the above two factors. This involves, at least in part, the allocation of resources for gathering, assessing and using information and other forms of knowledge and expertise. In the author's judgment, this is an intelligence processing organizational activity.

Second, the process of innovation has been referred to as a form of decision making in which, as stages unfold, the salience of intelligence is identified. Furthermore, innovations diffuse through social networks by the process of intelligence transfer. Though the analyses are generally individualistic, the logic is sound for emergent organizational considerations.

Third, in both types of literature examined, the decisional processes are defined in terms of stages, i.e., from awareness of need, through the identification of alternatives, to the selection, trial and evaluation of choices. The process is almost exclusively defined in terms of the individual decision maker or innovator. The organization and environment therefore becomes the situational field for decisional processes. It is the author's view that a more organizational conception of the process itself would be worthwhile.
In other words, the assumption about the individual decision maker will be maintained, but the organization will be viewed as much more than a situational field. Rather it is a decisional environment through which changes become developed and implemented. In order to conceptualize this organizational process on its own terms, it is referred to as an intelligence processing organizational activity. Organizational change, the present focus, is therefore an intelligence processing phenomenon. In sum the concept of intelligence processing captures an important aspect of organizational activity (one of the eight basic dimensions of organization) and is crucial to an understanding of the process of organizational change.

The work of Wilensky has been of primary heuristic value in the perspective of organizational intelligence processing. Wilensky developed the concept of intelligence from an interest in the relationship between experts, intellectuals, and policy makers. He suggests that intelligence represents gathering, processing and communicating the technical and political information used in the decision making process. He is concerned with the determinants of the use of intelligence, the structural and doctrinal routes of intelligence failures, and the conditions which facilitate the flow of high quality intelligence. In Wilensky’s judgment, the latter is clear, timely, reliable, valid, adequate, and wide ranging. Intelligence failure is the inability to generate the intelligence needed for pursuit of organizational goals. And, as Wilensky reviews military, government, and corporate history, he finds that these failures have been frequent. So paramount is the concept of intelligence for Wilensky, that he argues
it is one of the four fundamental problems of complex organizations, i.e., goal setting, control, innovation, and intelligence.

Wilensky argues that the resources devoted to intelligence and its functions are a product of several inter-related factors. Among these are the availability of intelligence, the relation of the organization to its internal and external environment, and the organization's structural complexity (size, heterogeneity of membership, diversity of goals, centralization of authority). He develops on this basis a series of propositions about intelligence allocation. For example, he hypothesizes that the more the organization is in conflict with its environment, or depends upon it for goal attainment, the greater the resources allocated for the intelligence function. Another example is his hypothesis that size specialization, centralization, heterogeneity of goals, etc., generate the need for intelligence because they expand the variety and number of units in the environment which must be taken into account, increase the need for internal control, and intensify the search for uniformity which can be formalized in the form of explicit rules.

Of specific interest to this study is Wilensky's argument that as costs and uncertainty increase, and as the need for change becomes increasingly significant, the more intense the search for intelligence. Furthermore, urgency activates high quality intelligence because deliberations move out of prescribed hierarchy to sources of generalized intelligence (e.g., men of knowledge) wherever they are located in the organizational structure or environment. In other words, the hypothesis is that under conditions of urgency, intelligence
will often supercede authority positions in decision making.

The preceding discussion of Wilensky neglects some very important aspects of his argument. For example, he spends a great deal of time examining internal sources of intelligence distortion such as hierarchy, specialization, centralization, etc., and argues cogently for measures to combat them. He is particularly concerned with intelligence pathologies and supplies a wealth of conceptual clues for any empirical work about intelligence failures. Furthermore, he refines and elaborates the typology of intelligence experts he had developed in an earlier work. The primary concern, however, is to convey the concept of intelligence as an intellectual tool for examining the process of change in organizations.

As mentioned earlier, the importance attached to intelligence is clear in the decision making and innovation literature although it is not couched in the same terminology. On the other hand there is no coherent body of intelligence literature as such, but there are a few discussions in which the intelligence function is made more explicit. For example, Simon suggested that finding occasion for making decisions, i.e., determining problem areas and needs, is an intelligence activity. Based on the degree of information available and the sophistication of search mechanisms, this activity will vary along a continuum from routinized to non-programmed. This of course is a constricted use of the term and is akin to environmental monitoring.

Dill views the organizational task environment as a flow of information. Thus environmental influence is determined by such
factors as exposure to different kinds of information, organizational readiness to gather and store environmental inputs, and organizational strategies for searching the environment. The environment provides sources of information about goals, means to achieve goals, and constraints; and sources of evaluations and judgments concerning organizational performance. With regard to the latter, environmental inputs provide the principle feedback mechanisms. Finally, as environments become more complex and multiply informational inputs, the strategies become much more elaborate and isolation of specific informational dimensions more problematic.

Friedman suggests that planning behavior reflects the introduction of ways to use technical intelligence to bring about changes. He suggests that the relative influence of technical intelligence in guiding social and economic change is dependent upon five factors. These are the clarity of system objectives; the extent of consensus about them; the degree of variance relative to the objectives expected in the performance of the system; the relative political importance attached to objectives; and the extent to which a technical as opposed to a purely political approach is capable of making system performance conform to objectives. Friedman argues that technical intelligence and planning is temporarily ascendent whenever goals are clear and valued, system performance is believed to depart appreciably from the norm, and expert judgment is considered more important than political manipulation.

Finally, cybernetic, or information (communications) theory has relevance for the concept of intelligence. For example, Dorsey
suggests some possibilities for applying communications theory to theories of administration. He argues for a communications model of administration which contains the following elements: (1) a communications net (organizational components, decisional centers), (2) information (a patterned transmission of events), (3) action (manipulating and processing the information through the net), (4) encouragement and discouragement of certain kinds of communications events (organizational goals), (5) individual decision centers and channels which are specialized, (6) centers and channels clustered and inter-related to make up subpatterns within the larger networks.

Hopefully the preceding discussion has indicated the relevance attached to the concept of intelligence processing. In reviewing selected aspects of the decision making and innovation literature the endeavor has been to show their similarities, contributions, and weaknesses for an analysis of organizational change. By means of the notion of intelligence processing, which is a basic organizational activity, it is felt that a theory of organizational change can be developed. Summarizing, intelligence processing is defined as an organizational activity in which information and other forms of knowledge are brought to bear in the definition of problems, selection of alternatives, and the choosing of courses of action to solve these defined problems. In this particular study formally instituted change or innovation in organizations is examined. Therefore, the concern is with the processes of obtaining (searching, gathering) and employing (interpreting and evaluating) the technical and political information (knowledge, values) requisite in problem solution and implementation
of these solutions in the form of objective alterations of extant organizational dimensions. In this case intelligence processing refers to purposive change as an adaptive response to an indeterminant environment.

This concludes the conceptual groundwork necessary for the model of organization change to be presented next. The concepts of organization, organization-environment, objective change, and the process of change are the central concepts underlying the model.
FOOTNOTES: Chapter II


2. Frequently mentioned schools are Scientific Management, Weberian Bureaucracy, Human Relations, Classical Administration, Group Dynamics, Decision Making, Neo-classical School, and many others. For an interesting discussion of these schools, their complementarities and differences, see Mouzelis, Organization and Bureaucracy. See also Amitai Etzioni, Modern Organizations (Englewood Cliffs, N.J.: Prentice-Hall Co., 1964).


8. Simon, Administrative Behavior, pp. 61-78.


11. This is stated, at the risk of oversimplification, to convey the point that system maintenance and the articulation of means to ends is tacit if not explicit in much of the literature.


18. This definition, of course, reflects considerable influence from the organizational literature. A particular intellectual debt has been the work of Bakke. See E. Night Bakke, "Concept of the Social Organization," in Mason Haire (ed.), Modern Organization Theory (New York: John Wiley and Sons, 1959), pp. 19-73.


21. This argument is similar to that presented by Tom Burns in his comparative article. See Burns, "The Comparative Study of Organizations," pp. 113-170.

22. The work of Bakke has been particularly instructive in the development of these conceptual components. See Bakke, "Concept of the Social Organizations," pp. 19-73. These eight dimensions are presented and elaborated in an earlier work by the author. The ensuing discussion is excerpted in part from that work. See Gary A. Kreps and Dennis E. Wenger, "Organization Change in a Community Conflict Environment," Working Paper No. 26, Disaster Research Center, The Ohio State University, Columbus, Ohio, 1970.


25. The concept of intelligence and intelligence processing will be examined in detail in the subsequent discussion of the process of organizational change. The concept is given considerable treatment in Harold Wilensky, Organizational Intelligence (New York: Basic Books, Inc., 1967).

26. Formalization is often couched in terms of rule specificity or degree of job codification. See for example, Michael Aiken and Jerald Hage, "Program Change and Organizational Properties: A Comparative Analysis," American Journal of Sociology, 72 (March 1967): 503-519.


28. This is the basic Weberian conception of authority.

29. Much of this work is summarized in Haydebrand, "The Study of Organization," pp. 59-86.


33. This summary does not include all of the literature. However, it does include those works deemed most representative or of heuristic value to the present study.


38. Thompson, Organizations in Action, (context).


53. Sociology emerged in an era of rapid social change and the classical writers such as St. Simon, Compte, Marx, Durkheim, and Weber were keenly aware of change as a social force.


65. Paul P. Lawrence, The Changing of Organizational Behavior Patterns (Boston: Harvard University Graduate School of Business Administration, 1958).

66. Perhaps a most typical example is Wilson's discussion of planned innovation in organizations and the need to maintain a balance between what Bernard had called inducements and contributions. See James Q. Wilson, "Innovation in Organizations: Notes Toward a Theory," in Thompson, Approaches to Organizational Design, pp. 193-218.


69. Though not dealing exclusively with change, the following illustrate the case study technique quite well: Peter Blau, Dynamics of Bureaucracy (Chicago: University of Chicago Press, 1953); and Alvin Gouldner, Patterns of Industrial Bureaucracy (Glencoe: The Free Press, 1954).


71. This definition and elaboration is excerpted from Kreps and Wenger, "Organization Change," p. 6. The definition has been influenced by many writers; of particular import has been Neil J. Smelser, Theories of Social Change and the Analysis of Nuclear Attack (McLean, Va.: Human Science Research Inc., 1967).


75. See for example, Martin Shubik (ed.), *Game Theory and Related Approaches to Social Behavior* (New York: John Wiley and Sons, 1964).


82. Thompson, *Organizations in Action*.


84. Thompson, *Organizations in Action*, pp. 25-144.


89. This is very similar to Burns and Stalkers' distinction between the organic and mechanistic forms of organizations. See Tom Burns and G. M. Stalker, The Management of Innovation (London: Tavistock, 1961).


91. Note that information from Rogers' book is referred to frequently in the next several paragraphs. In order to avoid a proliferation of footnotes, citations will not be continued. However, in all cases reference to Rogers is easily discernible.


94. Wilensky, Organizational Intelligence, (context). As with Rogers, footnotes will not be proliferated in the next several paragraphs, and clear reference to Wilensky is always made.


96. Wilensky, Intellectuals in Labor Unions.


CHAPTER III

A MODEL OF THE PROCESS OF CHANGE IN CRISIS RELEVANT ORGANIZATIONS

This chapter develops the theoretical model of change in crisis relevant organizations. The model elaborated here concerns the process of organizational innovation or purposive change when charter is threatened in an indeterminant environment.\(^1\) Organizationally, change is viewed as an intelligence processing activity, i.e., bringing technical and political information and/or knowledge to bear upon the definition of problems, selection of alternatives, and choosing courses of action to solve these defined problems. This intelligence may be an internal (incumbent mediating) or external (environmental mediating) organizational resource. Organizations can and do make changes on the basis of varying degrees of intelligence. The empirical question is to measure these varying degrees and their effect on the process and product of change. In the present study, the types of intelligence utilized in solving problems associated with civil disturbance is at issue empirically. The theoretical question is to develop a model in which relevant dimensions are interrelated in testable propositional form.

Certain underlying concepts were isolated, defined, and elaborated in the previous chapter. Organization, the sociological level
of the model, was defined as a purposive and open system of patterned activity which is structurally integrated to solve organizationally defined problems. Organizations were conceived as having the following analytical components: organizational charter, resources and technology, activities, normative structure, authority structure, power structure, status structure, and environmental relationships. Organization-environment relationships, linking the organization to an encompassing social structure were defined as the sum product of the organization's linkages with individuals, groups, publics, other organizations, and the physical setting. Of particular importance here are notions of environmentally generated uncertainty and the relevance of interorganizational and other relationships for organizational processes. Change, as an objective phenomenon, was defined as a relatively permanent alteration in the internal elements and/or external environmental relationships of an organization resulting from the effect of a change agent, within a specified space-time context.

This study is concerned with change as a specific behavioral outcome in crisis relevant organizations as a result of the threat posed by civil disturbance. The process of change is conceived as an intelligence processing organizational activity. This concept is the central analytical tool of the model.

There are six variables to be incorporated in the model:

1. Environmental threat to charter
2. Organizational change
3. Organizational intelligence
4. Comparative reference linkage
5. Range of problem solving

6. Complexity of the process of organizational change

Environmental threat represents the uncertainty dimension of organization-environment relationships which affects charter, an analytical component of organization. Organizational change specifically reflects the more encompassing concept of change as it has been defined. Intelligence is an organizational resource. Comparative reference linkage is a particular type of organization-environment relationship and is viewed as an extra-organizational source of intelligence. Range of problem solving and complexity of the process of organizational change are variable properties of change as an intelligence processing organizational activity.

The model which follows is an effort at systematic and middle range theory. It is middle range in that there are a small number of basic and derived propositions; this allows for well specified research questions which can be manipulated more efficiently. The model is also a systematic attempt at deductive theorizing as propositions concerning relationships between variables are explained by subsuming them under more general propositions from which they can be logically derived.

There are several levels of abstraction in any system of propositions. The assumptions and axioms (or basic premises) are at the highest order. These are left untested and essentially provide appropriate definitions for subsequently developed propositions. A second level of abstraction are the basic propositions, which are logical extensions of the axioms, specify fundamental inter-relationships, and
provide a framework for logical derivations. Finally, the lower level propositions are deduced and further elaborate systematic inter-relationships. The basic and derived propositions are offered for empirical examination and in this way the explanatory value of the entire system of abstractions will be verified, rejected, or refined.

The assumptions, axioms and basic and derived propositions will be presented in sequential fashion and their conceptual logic indicated. Bear in mind that the purpose of this chapter is to delineate the logic of the model. No discussion of indicators used in the research is included here, but will be presented in the methodology and analysis sections of the text. The assumptions made and the logic for the empirical measures utilized will be specified at that time. The discussion of the concept of organization (with its eight analytical dimensions), organization-environment relationships, objective organizational change, and the process of organizational change should have provided the necessary background for what is to follow. Of key import are notions of environmental uncertainty and threat to charter, intelligence and its processing, objective change in organizational dimensions to meet the threat to charter, and certain kinds of inter-organizational relationships, i.e., comparative reference linkage.

**Assumptions**

1. As problem solving social systems, organizations attempt to rationally pursue charter objectives in a dynamic and often uncertain environment.
2. Organizations facing environmental uncertainty and threat to charter, will adapt in response to that threat. Change, as defined, is one form of organizational adaptation.

3. Organizations facing environmental uncertainty and threat to charter require intelligence to bring about change as a form of organizational adaptation.

Assumption 1 expresses the orientation of the study to organizational behavior in general. It conveys the notion of system, system openness, and a tendency toward rationality in organizational behavior. In effect, it is assumed that organizations, as purposive systems, attempt to ascertain cause/effect understanding of internal structures and processes as well as domain relevant aspects of an encompassing environment. Although a tendency toward rationality is assumed, it should be made clear that rationality is always limited, both by environmental uncertainty and internal organizational dynamics. Taking this stance recognizes the arguments of Gouldner and others, which suggest that the interdependence among system parts is fluid, that differentiation inhibits functional integration, and that the environment can severely disrupt organizational activities. In the populations of police and fire departments analyzed, uncertainty and resultant threat to charter objectives was often considerable. In many instances, routine performance of organizational activities became problematic, existing structures inappropriate and human and material resources inadequate. Cause/effect understanding of
organizational behavior was clearly impaired under these conditions. In a very real sense, the situation demanded some form of organizational adaptation.

Assumption 2 states quite specifically that organizations will adapt in some way when charter is threatened. Whether or not change will occur as an adaptive response is, of course, an empirical question. One form of adaptation is to do nothing and face the possible impairment or loss of charter. For example, the empirical work of the Disaster Research Center concerning change as an adaptive response to natural disaster indicates that often very little change results from this experience. Short term adjustments during emergency response do not often lead to many permanent alteration in organizational dimensions. On the other hand, organizations can actively attempt to remove, control, or mitigate environmental threat through the development of appropriate mechanisms, some of which may be organizational changes. In this regard, it is necessary to specify what can change. As previously mentioned, change can occur in any of the eight analytical dimensions of organization, i.e., organization charter, resources and technology, activities, normative structure, authority structure, power structure, status structure, and environmental relationships.

By way of illustration, in this study the possibility of civil disturbance posed a direct threat to an important aspect of charter in many of these police and fire departments; namely, maintaining the law or effectively fighting fires to avert human and material loss. And, many of these organizations developed changes as an adaptive response
to that threat. For example, by establishing a new community relations unit, a police department made not only a structural change, but also an alteration in charter definitions, a specification of new requisite human resources, an expanded organizational technology, and quite likely a change in environmental relationships. A change in emergency planning represented, in many cases, an alteration in routine activities as well as in the normative and authority structures. Emergency equipment represented change in resources and technology. Establishment of mutual aid agreements represented change in organization-environment relationships. And so forth.

The implicit hypothesis is that change is a frequent form of adaptive response to environmental threats of this nature and it is hoped that the study will give credence to this view. In so doing, the study will also specify the conditions under which substantial change will occur, e.g., under conditions of high threat, high intelligence, high comparative reference linkage, etc. The conceptual underpinnings for change as an organizational adaptation to environmental threat come most directly from Thompson who elaborated the concept of environmental uncertainty and the organizational efforts to control it. Basic here is the position that organizations attempt to maintain the actualization of charter in a fluid environment. An organization's success at any given point is thus dependent upon its ability to viably sustain a balanced control of environmental influences. When this balance is threatened or altered, organizations can, and often do, change structures and processes to establish desired relationships with their environmental fields.
Assumption 3 suggests that organizations require resources to bring about change. And one of these requisites is intelligence as it has been defined. The broader assumption is that certain requisites must be met if organizations are to act at all. Among these are human and material resources employed in organizational technology. This is one of the basic elements of organization presented and intelligence is quite logically one resource of organizational activity. In this research, for example, police and fire departments often developed policies, plans, training, etc., to respond to the problems associated with civil disturbance. In so doing, they required intelligence, both internally generated and from environmental resources. In any event, it is assumed that there is an intimate relationship between organizational behavior or output (in this case change) and necessary intelligence resources.

**Axioms**

It would be possible to consider the following three axioms as additional assumptions in that they are not offered for testing, are direct logical extensions of the preceding assumptions, and are assumed to be true. However, they are designated as axioms (or premises) because they more directly underlie the basic and derived propositions to follow. In other words, it is upon these axioms that the inter-related system of propositions are based.

1. The greater the environmental threat to organizational charter, the greater the need for change as a form of organizational adaptation.
2. The greater the environmental threat to organizational charter, the greater the need for organizational intelligence.

3. The greater the need for change as a form of organizational adaptation, the greater the need for organizational intelligence.

Axiom 1 indicates a concomitance between increased threat to charter and the need for organizational change to meet that threat. If organizations attempt to rationally pursue charter objectives in a dynamic environment (as indicated in Assumption 1), then the need for change is more pronounced when charter is increasingly threatened. By need is meant that change becomes requisite for the organization to successfully continue its charter objectives. Recall that change has been defined as a relatively permanent alteration in the internal conditions and/or external environmental relationships of an organization brought about by the effect of a change agent. Environmental threat to charter, as a change agent, precipitates the need for change as an adaptive response because organizations, as rational systems, can not perpetuate extant charter without it.

Axiom 2 is directly derived from Assumption 3 and suggests a concomitance between environmental threat to charter and an intelligence requisite. By this it is implied that if any threat is to be met successfully intelligence resources must be obtained. And as threat increases, this intelligence need becomes more pronounced.

Axiom 3, of course, is a logical extension of Axioms 1 and 2, and indicates the concomitance between need for change and need for
intelligence. Explicit here is the position that the need for change dictates intelligence requisites.

Basic Propositions

1. The greater the environmental threat to organizational charter, the greater the organizational intelligence.

2. The greater the organizational intelligence, the greater the organizational change.

3. The greater the comparative reference linkage, the greater the organizational intelligence.

4. The greater the organizational intelligence, the broader the range of problem solving.

5. The greater the organizational intelligence the more complex the process of organizational change.

In Proposition 1 a correlation is suggested between increased environmental threat to charter and amounts of organizational intelligence relative to that threat. In effect, the objectives of the organization become problematic and its relationship to the environment altered and unstable. It is posited that an increasing amount of intelligence is brought to bear under these conditions. The uncertainty and threat must be defined and evaluated, possible courses of action elaborated, and decisions made as to appropriate types of response. All this requires increasing amounts of intelligence. In the case of police and fire departments, the occurrence or threat of civil disturbance was a direct environmental impingement upon the charter of
these organizations. This was a new contingency, at least partly undefined, to which an effective emergency response was essential. This necessitated intelligence resources concerning the development of appropriate policies, emergency plans and procedures, training, etc., to prevent or minimize associated problems. Therefore, it is hypothesized that increasing environmental threat will be associated with increasing amounts of intelligence in these organizations.

Proposition 2 posits an association between degree of organizational intelligence and organizational change. At the more abstract level, it is suggested that organizations with large amounts of intelligence employed in decision making will be adaptive, changing organizations. This is akin to Burns and Stalker's distinction between mechanistic and organic forms of organization. High intelligence organizations are more amenable to fluid environments, have a more elaborate technology, and will more readily change its structures and activities to meet new contingencies. In this particular study it is therefore hypothesized that those police and fire departments having greater amounts of intelligence related to the phenomenon of civil disturbance will show objectively greater amounts of change.

Proposition 3 deals with a particular type of interorganizational relationship. Recalling from Evan's discussion of organization sets, comparative reference linkages refer to relations between similar organizations, i.e., organizations having similar charters and perhaps structures and processes. In the context of this particular study, comparative reference relationships are other police or fire agencies with which the focal departments have been in contact. It is
hypothesized that as comparative reference linkage (number of such contacts) increases there will be a concomitant increase in organizational intelligence. The reasoning is that since these comparative reference organizations have similar environmental contingencies and problems, they require similar kinds of technical knowledge for effective operation. Therefore those organizations having many such relationships have available intelligence resources which can be obtained and employed in organizational activities.

In Proposition 4 a positive association between degrees of organizational intelligence and the range of problem solving in any given change area is suggested. For example, the definition or elaboration of a problem may reveal underlying complexity. Various courses of action not previously considered are likely to become possibilities with increased intelligence. With regard to the present focus, there has been a growing body of information within the safety network concerning the response or prevention of civil disturbance. This has emanated from various sources such as journals, associations, meetings, seminars, government agencies, and various police and fire departments as they develop their own programs. The intelligence deals with numerous aspects of the problem and has relevance for policy, planning, training, operations, and community relations in these organizations. It is suspected that those departments utilizing substantial amounts of this information will give consideration to more courses of action in the development and implementation of changes than those who do not.
Proposition 5 suggests that the greater the amount of organizational intelligence the more complex the process of organization change as has been elaborated. It is argued here that with increasing objective amounts of intelligence, the process of its gathering, interpreting, and evaluating becomes much more complex in its elaboration. In the review of the decision making and adoption process literature, the importance of information and other forms of knowledge in decisional activities was noted. Its presence or absence is therefore variable from one situation to the next. As was mentioned in Proposition 4, there has been a growing body of literature concerning civil disturbance which has been accessible to police and fire departments. Some departments have utilized rather substantial amounts of this literature in incorporating changes in various aspects of emergency related activities. In turn, in the development of organizational changes, variable numbers of organizational incumbents and subunits have become involved, various types of activities have been performed, and variable amounts of time have been expended. In effect, the process of change varies along a continuum which can be conceptualized as relatively simple to increasingly complex. The key point, of course, is the hypothesized positive association between degrees of intelligence and increases in the complexity of the process of change. With increasing intelligence, there is more data to be processed, the likelihood of more individuals being involved, and more time spent in the interpretation and evaluation of intelligence as well as the development of changes.
Derived Propositions

Propositions 6 through 15 are derived from the basic propositions and exhaust all logical possibilities.

6. The greater the environmental threat to organizational charter, the greater the degree of organizational change. (Deduced from 1 and 2)

7. The greater the environmental threat to organizational charter, the greater the comparative reference linkages. (Deduced from 1 and 3)

8. The greater the environmental threat to organizational charter, the broader the range of problem solving. (Deduced from 1 and 4)

9. The greater the environmental threat to organizational charter, the more complex the process of organizational change. (Deduced from 1 and 5)

10. The greater the comparative reference linkage, the greater the degree of organizational change. (Deduced from 2 and 3)

11. The broader the range of problem solving, the greater the degree of organizational change. (Deduced from 2 and 4)

12. The more complex the process of organizational change, the greater the degree of organizational change. (Deduced from 2 and 5)

13. The greater the comparative reference linkage, the broader the range of problem solving. (Deduced from 3 and 4)

14. The greater the comparative reference linkage, the more
complex the process of organizational change. (Deduced from 3 and 5)

15. The broader the range of problem solving, the more complex the process of organizational change. (Deduced from 4 and 5)

* The greater the intelligence of an organizational incumbent, the greater his influence in the process of organizational change.

Propositions 6 through 15 are logical derivations from the basic propositions of the model. For example, in Proposition 6 there is a hypothesized concomitance between threat to charter and degree of change brought about by mutual association of these variables with degrees of organizational intelligence; and so on. Just a few additional comments will be made.

The fifteen propositions represent a closed system. Obviously this has been done arbitrarily as any of a number of factors could have been included propositionally. The most prominent would be the inclusion of structural variables, e.g., the larger the organization, the more complex the process of change. The view is that variables

* This proposition can not be incorporated directly into the model because it presents an independent dimension of the phenomenon and is individualistically stated. It is presented as an additional hypothesis which will be addressed by the study because it has relevance for theoretical expansion of the model. Note, however, that it is not a new part of the closed system of propositions.
such as these are not as crucial as those in the model, i.e., they may complement the above interdependent factors but do remove or "explain away" these relationships. Yet, efforts should be made to measure these variables so that variance explained is not unnecessarily obfuscated. Second, it is felt that the system of propositions is distinctly organizational and captures the key emergent elements of the process of change without violating any assumptions about the individual decision maker. The organization is viewed as an intelligence processing decisional entity. In this case objective change is the product of this process. Third, the above is essentially a model of purposive or planned change, precipitated by an environmental contingency (civil disturbance) to which the organization purposefully responds. It should be noted, however, that organization change can result from many other factors which are not planned. For example, an impacting disaster agent such as a tornado may significantly change the resources of an organization in a very direct, spontaneous manner. Fourth, the research deals specifically with police and fire departments and the sample was not randomly drawn. Strictly speaking, the inferences are restricted within these parameters. However, it is felt that the model is relevant for these types of organizations generally as well as other cases where planned organizational change is at issue conceptually. The author trusts that this judgment can be evaluated through this study as well as other research.

Finally, the last proposition is not included in the system of propositions for the reasons mentioned. But, it is deemed to be an interesting hypothesis which can be examined by this study and will
provide an additional direction for theoretical expansion of the model in the last chapter. Furthermore, this hypothesis allows for examination of the validity of the variable of intelligence and the concept of intelligence processing. The model attaches great importance to the relationship between intelligence and organizational change. If intelligence is an important factor, then those individuals who play intelligence boundary roles, i.e., who mediate intelligence resources, ought to exert greater influence in organizational decision making; sometimes exceeding incumbents of higher authority. Wilensky suggests that urgency activates high quality intelligence because deliberations move out of prescribed hierarchy to sources of generalized intelligence (men of knowledge) wherever they are located. This is similar to March and Simon's discussion of uncertainty absorption which refers to the editing of information to the point where it can guide policy. The incumbents or units which perform this function are given unusual latitude to define situations and control events.

By way of summary, the following is an outline of the model just elaborated. The next two chapters discuss the data and methodology employed and then analyze the model.

The Model

Concepts

I. Organization: A purposive and open system of patterned activity which is structurally integrated to solve organizationally defined problems. Organizations have the
following analytical elements: organizational charter, resources and technology, activities, normative structure, power structure, authority structure, status structure, and environmental relationships.

II. **Organization-Environment Relationships**: Sum products of an organization's linkages with individuals, groups, publics, other organizations and the physical setting. Important model dimensions include the following: uncertainty, threat, and comparative reference and other network linkages.

III. **Objective Organizational Change**: A relatively permanent alteration in the internal elements and/or external environmental relationships of an organization resulting from the effect of a change agent, within a specified space-time context.

IV. **The Process of Organizational Change**: An intelligence processing organizational activity in which technical and political information and/or knowledge are brought to bear in the definition of problems, selection of alternatives, and choosing courses of action to solve these defined problems.

**Assumptions**

1. As problem solving social systems, organizations attempt to rationally pursue charter objectives in a dynamic and often uncertain environment.

2. Organizations facing environmental uncertainty and threat to charter will adapt in response to that threat. Change, as defined, is one form of organizational adaptation.
3. Organizations facing environmental uncertainty and threat to charter require intelligence to bring about change as a form of organizational adaptation.

Axioms

1. The greater the environmental threat to organizational charter, the greater the need for change as a form of organizational adaptation.

2. The greater the environmental threat to organizational charter, the greater the need for organizational intelligence.

3. The greater the need for change as a form of organizational adaptation, the greater the need for organizational intelligence.

Variables

1. Environmental threat to organizational charter.

2. Organizational change.

3. Organizational intelligence.

4. Comparative reference linkage.

5. Range of problem solving.

6. Complexity of the process of change.

Basic Propositions

1. The greater the environmental threat to organizational charter, the greater the organizational intelligence.

2. The greater the organizational intelligence, the greater the organizational change.

3. The greater the comparative reference linkage, the greater the organizational intelligence.
4. The greater the organizational intelligence, the broader the range of problem solving.

5. The greater the organizational intelligence, the more complex the process of organizational change.

Derived Propositions

6. The greater the environmental threat to organizational charter, the greater the degree of organizational change. (Deduced from 1 and 2)

7. The greater the environmental threat to organizational charter, the greater the comparative reference linkage. (Deduced from 1 and 3)

8. The greater the environmental threat to organizational charter, the broader the range of problem solving. (Deduced from 1 and 4)

9. The greater the environmental threat to organizational charter, the more complex the process of organizational change. (Deduced from 1 and 5)

10. The greater the comparative reference linkage, the greater the organizational change. (Deduced from 2 and 3)

11. The broader the range of problem solving, the greater the organizational change. (Deduced from 2 and 4)

12. The more complex the process of organizational change, the greater the organizational change. (Deduced from 2 and 5)

13. The greater the comparative reference linkage, the broader the range of problem solving. (Deduced from 3 and 4)
14. The greater the comparative reference linkage, the more complex the process of organizational change. (Deduced from 3 and 5)

15. The broader the range of problem solving, the more complex the process of organizational change. (Deduced from 4 and 5)
1. Whether or not a purposive change is labeled as innovative is dependent upon such factors as the source of the idea or the time the change was made relative to other changing organizations (e.g., other police and fire departments). This is another question, which though crucial to any diffusion model, is not of concern here. To handle such a research problem would require a specified adoption period and some form of diffusion curve which would differentiate between adopter categories (innovators, early adopters, late adopters, etc.). See Everett M. Rogers, *Diffusion of Innovation* (New York: The Free Press, 1965).


8. One of the most insightful conceptualizations of organizational action and the necessary requisites for it is that proposed and elaborated by Jack M. Weller, "The Social Organization of Disaster Response" (Master's thesis, The Ohio State University, 1969).


12. "A fundamental principle of the axiomatic model is that given (n-1) basic hypotheses where n = the number of variables, and given that all variables appear in at least one of the (n-1) hypotheses, then all other hypotheses within the theoretical system may be derived. The total number of basic and derived hypotheses is therefore n(n-1)/2." See Schwirian and Prehn, "An Axiomatic Theory," p. 814.


14. This point was noted in the following article: Charles Perrow, "Departmental Power and Perspectives in Industrial Firms," in Mayer Zald (ed.), *Power in Organizations* (Nashville: Vanderbilt University Press, 1970), pp. 59-90. For the original discussion see James G. March and Herbert A. Simon, *Organizations* (New York: John Wiley and Sons, 1958), pp. 164-166.
CHAPTER IV

METHODOLOGY

The methodology utilized in the study will now be summarized and the discussion will be organized in terms of three topical areas: the police and fire departments selected for analysis; the data collection methods employed in the study and some associated problems; and the specific indicators and their measurement, developed both for the variables employed in the model and some additional variables of possible relevance. The underlying research focus of the study was to conceptualize and empirically examine the process of organization change as an adaptive response to an uncertain and threatening environment. Based upon a heuristic excursion through various relevant literature in Chapter II, a model of this change process was developed in Chapter III. Some detailed case analyses were then required to empirically assess the utility of the model.

The Cases

Since 1968, the Disaster Research Center has been studying several cities in the United States; monitoring their natural disaster and civil disorder history and examining the types of adjustments made by various community organizations to these types of threat. The present study focused specifically upon police
and fire departments in the following selected cities:

Los Angeles, California
Oklahoma City, Oklahoma
Lubbock, Texas
Brownsville, Texas
Miami, Florida
New Orleans, Louisiana
Louisville, Kentucky
Buffalo, New York
Columbus, Ohio

*Dayton, Ohio (police only)
Cincinnati, Ohio
Toledo, Ohio
Youngstown, Ohio
*Detroit, Michigan (fire only)
*St. Louis, Missouri (fire only)
Indianapolis, Indiana
Topeka, Kansas

It should be made clear that these cases were not selected to test the present model specifically, but had been chosen sometime earlier for more encompassing community analysis. Thus the sample was not randomly drawn and, as it is relatively small, there are no built-in controls. More appropriately stated, the purpose of the model was to "explain" the observed change in these organizations.

In spite of the limitations in this sample selection, these cases presented some rather distinct advantages. Of crucial import was the fact that entree with organizational incumbents was pre-established. As civil disturbance is a sensitive area for social research, the pre-existent legitimation and rapport with these respondents was essential to research efforts and greatly facilitated candid and complete answers to questions. Second, as can be seen, the author was only able to study one of the two relevant departments in each of these cities.
the sample had fairly broad geographic representation. Though five of the cases are Ohio cities, three are more southerly (Miami, New Orleans, Louisville), four are westerly (Los Angeles, Oklahoma City, Lubbock, and Brownsville), one (Buffalo) is an eastern city, and four are from other midwestern states (Indianapolis, Detroit, St. Louis, and Topeka). Though this was clearly not a nationally representative sample, there was rather broad coverage for so small a number of cases.

Another relevant point is that the cities themselves represented considerable variability on one dimension of the model, i.e., environmental threat to charter. As will be defined in more detail later, there was considerable difference among these cities in terms of civil disturbance history and potential. For example, Los Angeles, Detroit, and Cincinnati had experienced civil disturbances of great magnitude while Oklahoma City, Lubbock, and Brownsville had experienced very little threat. In all cases, however, at least some objective threat was anticipated, either in terms of actual unrest experience or in terms of a substantial minority population (Black and/or Mexican American).

Finally, there was considerable variability among the specific police and fire organizations in terms of the remaining elements of the model, i.e., organizational change, intelligence, comparative reference linkage, range of problem solving, and complexity of change. Thus an assessment of the importance of and relationships among these variables was clearly possible. Furthermore, these organizations varied along structural dimensions such as size, wealth, education, centralization, complexity, and bureaucratization,
thus allowing analysis of the possible impact of these variables upon the model developed.

In sum, the chief weaknesses of the sample were that it was not randomly drawn and its size did not allow for any built-in control. Thus, generalizations were not statistically possible, nor were more sophisticated multi-variate analysis techniques based upon larger samples. The former weakness was tempered by the fact that the sample contained considerable geographic and social structural variation. The latter weakness, though clearly important, was mitigated by the fact that the impact of several variables not in the model could be measured and evaluated relative to those included. As this is the crux of theory building at this incipient level, it was felt that this weakness had been adequately compensated.

The major advantage of the sample was its amenability to systematic case analysis. An adequate examination of the model required thorough empirical study of the process of change through in depth interviewing and other data. The proved possible in fifteen police and sixteen fire departments because of previous entree with organizational incumbents. Furthermore, the cases provided sufficient variability in the model elements to make meaningful distinctions.

Data Collection

Initial observations in these police and fire departments indicated that changes from 1965-1969 were occurring in one or more of the following five areas: policy, planning, training, operations, and where existent, community relations. Of course these five areas
were not mutually exclusive. For example, new policy represented, at the very least, change in the organization's official normative structure, and was also likely to affect organizational activities and resources. Therefore, a specific policy statement concerning crowd control had direct implications for emergency operations of police departments. Similarly, a new policy in fire departments concerning false alarms clearly affected emergency alarm procedures. And so on.

In order to get coverage of these topical areas, certain standard procedures for interviewing organizational incumbents were employed. For policy, the chief of the department appeared to be clearly appropriate. As head of the organization, it was felt that he was most likely to have overall knowledge of the organization's affairs as well as play an important role in policy development. In the planning area, some departments maintained a specific subunit to perform this function. In these cases, the head of these units was usually knowledgeable about changes in emergency planning. Where this subunit did not exist, those persons specifically involved in the writing or revision of emergency plans were sought out as respondents. For training, in most cases a member of the training academy (usually the director) was identified as the appropriate informant. In the operations area, someone who had operational responsibility during civil disturbances was interviewed. In most cases this turned out to be the operations head (usually an assistant chief). Where community relations units existed, the director of this subunit was readily identifiable as an appropriate informant.
The study was set up in the following manner for each case in the sample. A letter (see Appendix A) explaining the purpose of the research was first sent to the chief of the department. A followup telephone call further elaborated the research interests and attempted to arrange specific dates and times for the required interviews. These arrangements were possible in all but two police departments who were unable to participate in the study. A confirmatory letter finalized the arrangements. At the designated dates, a field team (usually two men) was sent to complete the study. Data collection spanned approximately a ten month period, March to December 1970.

Specific instruments were designed for each interview. The policy instrument (see Appendix B) was designed to perform essentially two functions. First, a change checklist (see Appendix B) was administered to each chief. The specific change items were, of course, different for police and fire departments. The purpose of the checklists were to determine the range of changes which had occurred in any particular department during the space-time context that had been specified, i.e., 1965-1969. It was felt that the head of the organization would be most able to adequately complete the checklist. This proved to be the case. Changes were categorized in terms of six general areas with specific items subsumed under each. The following categories were used for all organizations: planning for emergency response, training, resources, specialized subunits, relationships between the focal organization and other emergency organizations, and relationships with the public and community groups. Based upon the author's knowledge of police and fire departments, it was felt that
the checklists encompassed all possible organization changes which might have occurred. This assessment was substantiated in virtually all cases. A second function of the policy instrument was to isolate which of the six change areas the chief was most involved in and then raise a series of questions, specific to the model, about these changes. The restriction to one area was necessitated by the overall length of the questionnaire and the interview period required to complete it. It was therefore impossible to tap completely the chief's knowledge of all changes in his organization.

The planning and training instruments (see Appendix B) raised the same specific questions as the policy interview but couched them in terms of changes in the planning and training areas. These three instruments as a whole guaranteed relatively detailed data in at least two and in some cases three of the six change areas.

The operations instrument (see Appendix B) provided two kinds of information. First, it attempted to determine the impact that changes in policy, planning, and training had on emergency operations. For example, was planning merely at the paper stage or did it actually permeate emergency organizational activity? Second, the instrument determined what role operations people played in the development of these changes and their evaluation of them. This allowed the more clear determination of the total range of participation in the process of change as well as a check of the validity of information gained in other interviews.

The community relations instrument (see Appendix B) was not developed to examine the model in question and forms the basis of a
different study. However, the instrument did perform an important role for this research. This questionnaire asked detailed questions about the development of community relations programs and their present status in terms of number of personnel and range of activities. As considerable variation existed among organizations in community relations effort, the instrument provided important discriminating information about this change and its development.

Two additional instruments of some importance were utilized. Since intelligence gathering is an important aspect of the model, when a person had personally engaged in substantial intelligence search, a liaison instrument (see Appendix B) was incorporated into the interview situation. The purpose of the instrument was to gain more detailed information about this dimension and the uses put to intelligence once it was obtained. Finally, a documentary checklist (see Appendix C) was given to appropriate records personnel to have filled out and returned. This instrument provided measurement of a series of structural variables to be assessed relative to those included in the model.

A total of 68 interviews were made in police departments, with a mean of 4.5, a range of 2-8, and a median of 5 interviews. A total of 68 interviews were also made in fire departments with a mean of 4.3, a range of 1-6 and a median of 4.25 interviews. Those departments experiencing low change of course had fewer interviews as there were fewer change areas to discuss. Thus in police departments, three low change departments had only 2 interviews while 4 higher change departments had 6 and one had 8 interviews. In fire departments, 2 low
change departments had 2 interviews and a third only one, while 4 relatively high change departments had 5 interviews and another had 6. The interviews averaged approximately one to one and one half hours, the longest generally being the policy interviews. The interviews essentially attempted to obtain the following types of information: identification and measurement of perceived problems brought about by civil disturbance threat; descriptions of changes and the problems to which they were directed; identification of participants in the development of changes and the basis of their participation; measures of the existence and sources of intelligence utilized in the development of changes; insight into the structure of decision making and measures of the complexity of the change process; measures of the relevance of environmental linkages to the development of changes; data concerning structural dimensions of each organization.

This section will be concluded with a discussion of methodological problems encountered in the collection of data. One might argue that problems are inherent to research of this nature because it attempts to examine in some detail the subtlety of organizational process. The following discussion focuses upon three issues: the substantive area of research, the validity of the data, and its reliability.

There was some initial concern that the subject of civil disorders would be a sensitive area for research, particularly since large amounts of data were required. The concern was articulated in terms of two possible problems: the willingness of respondents to cooperate and the candor and completeness of the information provided. The former proved to be a relatively minor problem. Only
two of the selected organizations chose not to participate; thus an acceptance rate of over 93 percent was experienced. In most cases assistance was generously provided at all phases of the research, from entree, to identification of appropriate respondents, to supplying complete information. Though more difficult to document, the latter did not appear to be a pronounced difficulty. With a few exceptions, great efforts were made by respondents to relate to all questions and answer them to the best of their knowledge. When several accounts of similar situations were presented substantial factual agreement was noted.

This brings up the matter of validity. Have respondents provided a factually accurate picture of the phenomenon under consideration? The study attempted to obtain information from a four year period through in-depth interviewing. In this regard, the author was acutely aware of possible validity problems such as the lack of accurate and complete information by certain respondents, recall decay of those having necessary information, and the possible misrepresentation of facts. The first problem was overcome in large measure by the prior identification of those persons knowledgeable in the areas under consideration. This identification was initially established through the head of each organization and subsequently continued in interviewing of those initially identified. Identified individuals were directly involved in the development of changes in most cases, thus enhancing the accuracy of description. The problem of recall decay was mitigated by the desire of many respondents to seek out specific information when they could not remember needed
details. Furthermore, interviewers were instructed to probe carefully for data when gaps became evident. Inevitably there were some gaps due to the breadth of the data required and the extended time period covered. The problem of misrepresentation was difficult to detect. Therefore, some assumption as to the veracity of respondents' statements had to be made. Crosschecks for validity of information were done where possible and in these cases substantial agreement was indicated. For reasons of parsimony, these checks were not a formalized aspect of instrument design. Hence great reliability was placed upon the skill of Disaster Research Center interviewers.

Reliability in this study concerned the extent to which similar data was obtained from each department in the study. Reliability was addressed in basically three ways. First, a series of formalized instruments were developed for the study. Thus essentially the same questions were presented to each organization. Second, similar interviewing instructions were given for all organizations contacted both in terms of the identification of appropriate respondents and the necessity of administering the instrument as closely as possible in its present format. Third, great efforts were made in instrument design to remove ambiguous questions. Undoubtedly problems in reliability were not completely overcome. The study often demanded considerable clarification and probing in order to gain accurate information. In some cases this resulted in lack of continuity in the administration of instruments from organization to organization. However, to the extent that validity was enhanced through probing,
it was felt that reliability would be less of problem. This, of course, is a guiding principle of social research.

**Measurement of the Variables**

The model presented in Chapter III propositionally relates the following six variables:

1. Environmental threat to organizational charter
2. Organizational change
3. Organizational intelligence
4. Comparative reference linkage
5. Range of problem solving
6. Complexity of the process of organizational change

Each of these variables was operationalized in terms of two or more indicators. In virtually all cases there was no precedent in the literature for the measurement of these variables. Consequently, efforts were made to tap several indicators for each variable, not knowing at the outset how successful their individual measurement would be. It was hoped that through these indicators discrimination among organizations along each variable in the model would be possible.

In addition, several structural variables were measured for their possible relevance to the model. Discussion of their measurement will also be included.

It was mentioned earlier that the sample and the nature of the data did not allow for multi-variate analysis or statistical inference. Thus the samples should be treated as populations of police and fire departments whose representativeness allows for some, but not
systematic generalization. Several indicators for each variable in
the model were measured, some successfully and some not. As a result,
it was possible to make ranking distinctions with some confidence, but
the data could not be treated as interval level. The measures should
thus be treated as ordinal data whose purpose is to discriminate
along model and other variables. In view of the newness of the model
and the exploratory nature of the measures, the author is relatively
satisfied with the results so far.

In analyzing each organization, data was initially coded from
the interviews using an "Interview Analysis Form" (see Appendix D).
As data had to be extracted from relatively long interviews, this
form of qualitative and quantitative coding was essential. After
initial interview coding, data was then aggregated for each organi-
zation suing a "Data Analysis Form" (see Appendix D). The aggregated
data was subsequently used to establish ranks on each variable. The
possible problem of comparability of change areas was an initial
concern in coding the data. However, comparability proved not to
be a problem in either police or fire departments. When fewer
change areas were discussed, it was the result of lower overall
change; and this was what the model was specifically attempting to
address. One other point should be mentioned at the outset. Police
and fire departments were treated as separate populations. Though
grossly similar as para-military structures, these organizations have
different charters, technologies, activities, and, at the very least,
a different range of changes and intelligence resources. Consequently,
to attempt systematic model examination across these sets of organizations would be unwarranted at this point.

Environmental Threat to Charter

Environmental threat reflects the degree to which accomplishment of charter responsibilities are rendered problematic by the phenomenon of civil disturbance. Three pieces of data were utilized in the measurement of this variable. The first set of indicators elaborates the civil disturbance history and minority population of each city in the study and is therefore identical for both police and fire departments in each locale:

1. Number of civil disturbance events 1965-1969
2. Total number of days of civil disturbance 1965-1969
3. Total number of civil disturbance related deaths 1965-1969
4. Total number of civil disturbance related injuries 1965-1969
5. Total number of civil disturbance related deaths to police and fire personnel 1965-1969
6. Total number of civil disturbance related injuries to police and fire personnel 1965-1969
7. Total amount of civil disturbance related property damage 1965-1969
8. Percent minority population in the community

Number of civil disturbance events and total number of days of civil disturbance reflected actual civil disturbance experience. Deaths,
injuries, and property damage were directly related to these occurrences. Percent minority population was examined as a measure of potential or propensity for disturbance. It was felt that, as a group, these indicators factually represented the civil disturbance experience of these cities and therefore reflected variations in threat to organizational charter. In this case threat was operationalized as an objective historical dimension.

Further probing this variable from the standpoint of subjective or perceived threat, the policy, planning, and training instruments contained the following two questions:

1. What particular problems did civil disturbance or the threat of them present to (policy, planning, training) in your organization?

2. In viewing these problems, we would like you to rate generally how important the solution of these problems was to the (policy, planning, training) objectives of effective emergency response.

   ___ very important
   ___ moderately important
   ___ of little or no importance

Question 1 examined the ability of the respondent to articulate civil disturbance related problems. The assumption was that as more problems were defined there was both greater knowledge of the organizational ramifications of the phenomenon and greater perceived threat. Question 2, in the form of a forced rating, further probed the subjective definition of threat. Data from these questions became
quite useful when making distinctions on the basis of perceived threat.

Of the several measures of objective threat attempted, it was felt that number of civil disturbance events and total number of days of civil disturbance experience were the best measures. Arrests, deaths, and injuries were already incorporated in the criteria used for determining civil disturbance events. Deaths and injuries to police and fire personnel, and property damage did not yield reliable data. Percent minority group did not correlate well with any of the other measures. Number of events and total number of days inter-correlated quite well (.93). Number of days was selected as the final measure because it allowed for finer discrimination (no tied ranks). The organizations were also ranked on the basis of subjective or perceived threat using number of articulated civil disturbance related problems and the problems rating question. The correlations between objective and subjective threat were not particularly high: .43 for police departments and .68 for fire departments. (The implications of this finding will be indicated in the analysis of the model.)

Organizational Change

Change was defined as a relatively permanent alteration in the internal elements and/or external environmental relationships of an organization resulting from the effect of a change agent, within a specified space-time context. In this case civil disturbance threat was the precipitating agent and the period 1965-1969 the context employed for analysis. The change checklist was the major tool for
measuring this variable and was administered to all heads of departments. Each of the change categories can be articulated in terms of one or more of the eight analytical dimensions of organizations discussed in Chapter II. Thus relationships between the police and other emergency organizations represents change in organization-environment relationships. The acquisition of new emergency equipment or the development of new training techniques represents change in organizational resources, etc. Only those items specifically established or modified from 1965-1969 and still existent in 1969 were labeled as change. Therefore, a community relations program established in 1967 but disbanded in 1963 was not considered as a change within the specified context.

The checklist alone was not felt to discriminate sufficiently in all cases. For example, there is considerable variation in the depth and coverage of civil disturbance plans, emergency and community relations training, emergency resources, and community relations units and programs. The checklist merely specifies presence or absence and each item has equal weight. The following data, when available, provided further discrimination in degree of change:

1. Civil disturbance plan

   Number of pages _____
   When established _____
   Number of revisions _____
   Number of interorganizational relationships specified in plan _____
Several factors were used to discriminate among civil disturbance plans. Number of pages, percent of budget expended for planning, when the plan was established, and number of revisions gave greater insight into the overall magnitude of planning changes. As interorganizational relationships are often very important in emergency response (e.g., mutual aid pacts, emergency operations centers, etc.), the incorporation of this factor into planning represented an additional dimension of change. Provisions for alternative operational procedures got at the complexity of planning. Provisions for updating and training gave some indication of the extent to which changes in emergency planning have been built into organizational routines. With regard to training, the percent of budget expended for training gave some
indication of the overall magnitude of training changes. In the community relations area, size of staff and number of programs specified the magnitude of community relations change. Percent of budget spent on equipment examined change in organizational resources. Finally, civil disturbance related grants gave some indication of the external resources generated directly or indirectly by civil disturbance phenomenon.

These measures allowed for making further distinctions in magnitude of the change variable. This was particularly important when organizations had similar configurations on the checklist. The assumption in using both the checklist and the other measures was that the higher the number and magnitude of the items, the greater the change which had occurred in these organizations. In sum, organizations were first ranked in terms of the number of items on the change checklist. Additional data concerning magnitude of planning, training, equipment, and community relations changes allowed for slightly more precise rankings.\(^7\)

**Organizational Intelligence**

Intelligence was defined essentially as technical and political information used in the development of organization changes. The problem was one of determining the types and degree of intelligence employed in change development. A series of questions in the policy, planning, training, and liaison instruments were developed to elicit measures for the following indicators of organizational intelligence:
1. Number of site visits to other departments to obtain information about emergency operations or specifically change related programs

2. Number of civil disturbance related conferences attended

3. Number of civil disturbance related training seminars attended

4. Number of emergency plans examined

5. Number of relevant publications utilized

6. Number of other intelligence sources

7. Formalized feedback from experience (e.g., after action reports) yes no

8. Formalized feedback from intelligence gathering (e.g., a filing system for outside intelligence) yes no

The above list exhausted all possible objective intelligence sources in the civil disturbance area from either a response or prevention standpoint. The assumption was that increasing amounts of these types of information represented greater degrees of intelligence existent within an organization.

Ranks were determined for both police and fire departments by first aggregating the number of site visits made, number of conferences or training seminars attended, number of plans examined, number of publications used, and the number of other intelligence sources mentioned. When tied ranks resulted, formalized feedback from experience and/or intelligence gathering were criteria for further discrimination.
Comparative Reference Linkage

Comparative reference linkage refers to a particular type of interorganizational relationship and is defined as relations between similar organizations, i.e., organizations having similar charters and perhaps structures and processes as well. In this study, comparative reference was represented by other police or fire organizations with which the focal departments had been in contact. The following question in the policy, planning, and training instruments attempted to measure comparative reference contacts.

Your department may have been in contact with other (police, fire) agencies from time to time to discuss problems, exchange information, obtain advice about new programs, techniques, etc.

a. What particular departments were you in contact with?

b. What was the nature of the contact?

c. Which of the following most nearly describes the extent of this contact?

- frequent contact with many departments
- frequent contact with a few departments
- relatively infrequent contact with other departments
- little or no contact with other departments

Therefore, comparative reference was operationalized in terms of the specific number of contacts, some indication as to the nature of the linkage, and a ranking of the magnitude of comparative
reference generally by the respondent. It was assumed that the number and nature of other police and fire department contacts adequately reflected comparative reference as conceptualized. It was further assumed that respondents would be able to characterize this dimension in terms of a close ended ranking question. Organizational ranks were first determined by the number of comparative reference contacts mentioned in the interviews. Ties and ambiguous findings were resolved by using the average score on the comparative reference rating question.10

Range of Problem Solving

Range of problem solving is defined as the degree to which various alternatives are considered in the development of changes. The model posits that there will be an expansion of alternatives consideration with increased organizational intelligence. For example, does the examination of ten plans as opposed to one broaden the range of problem solving? The following two questions were developed for the policy, planning, and training interviews to measure this dimension:

1. It is possible that time was spent considering possible courses of action in (policy, planning, training). Which of the following most clearly describe your organization?

_____ a great deal of time was spent considering possible courses of action
a small amount of time was spent considering possible courses of action

practically no amount of time was spent considering possible courses of action

2. What other alternatives were seriously considered?
   a. Why were these alternatives rejected?
   b. Were there any disagreements over the merits of these alternatives?
   c. How were these disagreements resolved?

The variable was therefore operationalized in terms of a rating question characterizing the change process in general, the specific number of alternatives mentioned in the interview, and any elaboration of alternatives consideration which could be gleaned through probing. It is assumed that problem solving reflects the consideration of various courses of action, has a time dimension, and can be conceptualized as falling along a continuum from low to high.

This variable was particularly difficult to rank and the results were not completely satisfactory. The number and elaboration of alternatives as well as a ratings question were used as measures. In many cases respondents were unable to relate specific details about courses of action considered. Analysis was forced to fall back on the average score on the rating question and any elaboration in the interviews which could be used for further distinguishing organizations. The resultant ranks were based on qualitative data as much as they were on a quantified score.
Complexity of the Process of Organizational Change

It was suggested here that the process of change varies along a continuum from relatively simple to increasingly complex. The model hypothesized that with increasing objective amounts of intelligence, the process of its gathering, interpreting, and evaluating becomes much more complex in its elaboration. The following questions in the policy, planning, and training instruments attempted to measure complexity of the change process:

1. Was a particular department of the organization assigned the primary responsibility for developing these changes?
   a. If so, how was this responsibility assigned?
   b. How was this responsibility carried out?

2. Which existing departments in the organization participated in making these changes?
   a. What was the nature of their participation?
   b. Who represented these departments?

3. Was any standing committee formed to develop or consider these changes?
   a. If so, who composed the committee?
   b. What were its activities?
   c. How often did it meet?

4. Approximately how many man hours were spent considering alternatives, gathering and evaluating information, and developing the (policy, planning, training) changes we have been discussing?
Based upon these questions, complexity of the change process was operationalized in terms of the following indicators: number of subunits involved in the development of changes, total number of persons involved, number of man-hours expended, number of meetings held, existence and activities of standing committees. It was assumed that each of these measures reflected degree of complexity, but there was no assurance that data could be obtained for all of them. Number of subunits was considered to be the primary measure due to its associated use in the literature for the measurement of complexity generally.\(^{12}\)

Of the several measures attempted, the number of subunits and the total number of persons involved in the development of changes were most productive. Number of man-hours and number of committees and meetings did not yield complete data. Since it was felt that number of subunits most clearly represented complexity, this became the prime measure. Number of persons involved was then used to break tied ranks. The additional measures and elaboration in the interviews, where usable, were employed to make further distinctions.\(^{13}\)

By way of summary, objective threat was measured in terms of civil disturbance experience. Subjective threat was operationalized as the number of articulated civil disturbance related problems and a rating question. Change was measured in terms of a checklist of organizational changes and a series of other factors which discriminated among various types of change. Intelligence was measured in terms of a series of intelligence inputs as well as the intelligence feedback mechanisms employed. Comparative reference was operationalized as the number of comparative reference contacts and a rating
question concerning magnitude of contact. Range of problem solving was measured by the number of alternatives considered in the development of changes and a rating question concerning degree of alternative consideration. Finally, complexity of the process of organizational change was measured primarily in terms of subunit and total individual participation in the development of change.

Structural Variables

Measurement of several structural variables was attempted to determine their possible relevance to the model. No prior predictions were made as to the direction or magnitude of possible association. The effort was to measure the strength of these variables relative to those in the model as a means of subsequent expansion of the theory. In some cases there was less confidence in the measures utilized than might have been desired. Though some have precedent in the organizational literature, the problems inherent in their measurement have been pointed out often.\textsuperscript{14} Table 1 outlines the variables with their associated indicators.

A few comments are in order about these indicators. Size is a relatively straightforward variable, has a direct empirical link, and requires few assumptions in measurement. Wealth is a somewhat ambiguous variable. A high operating budget does not necessarily represent high economic levels. It does, however, indicate potential economic resources having a possible bearing upon the phenomenon under consideration, e.g., money for new emergency equipment, planning, training, community relations programs, intelligence gathering, etc.
TABLE 1
ORGANIZATIONAL VARIABLES

<table>
<thead>
<tr>
<th>Variable</th>
<th>Indicator</th>
<th>Police</th>
<th>Fire</th>
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<tr>
<td>1. Size</td>
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<td>Number of uniformed personnel</td>
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<td>2. Wealth</td>
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<td>3. Professionalization</td>
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<td>4. Complexity</td>
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<td>Number of subunits</td>
<td>Number of stations</td>
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<td>5. Centralization</td>
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<td>6. Bureaucratization</td>
<td>Clerical/uniformed personnel</td>
<td>same</td>
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</table>

Professionalization was measured quite grossly. Hall's work points out the difficulty in measurement of this variable and it is recognized that there are clear limits in this use of the term.

The measures for complexity used in police departments is not unprecedented in the literature, although specification of meaning is often left unstated. The study utilized the variable as a dimension of organizational administration, but the author realizes there is an important technical dimension as well. It was impossible to utilize the same measure of complexity in fire departments because...
subunits are too highly standardized. The number of fire stations was chosen because it was felt to most clearly represent administrative complexity in this type of organization. In both cases, the ambiguity of the concept and the need for more systematic empirical examination is recognized.\textsuperscript{17}

The author hoped to use number of ranks in the chain of command as a measure of centralization. Authority structures are so standardized in both police and fire departments as to make distinctions impossible. Therefore, a gross measure using the ratio of ranked to total uniformed personnel was attempted.\textsuperscript{18} It is assumed that a lower ratio represented a lower portion of incumbents having some decision making function, thus higher centralization. Bureaucratization was measured by the ratio of clerical to uniformed personnel. This is similar to the A/P ratio used by Bendix and others.\textsuperscript{19}

With a few exceptions, measurement of these structural variables proved possible. It was impossible to get usable measures for professionalization and bureaucratization in fire departments. Length of recruit training was similar across fire departments and thus did not discriminate adequately. The only possible substitute was length of in-service training, but the data was incomplete, and even when obtained, was very similar. The ratio of clerical to uniformed personnel as a measure of bureaucratization did not work either. Fire departments have few specifically administrative personnel, i.e., this role is incorporated into other organizational statuses. Unfortunately, there was no alternate data which would tap this variable. Finally, measures of professionalization were possible in
only twelve police departments as three did not supply the necessary data. However, it was felt there were sufficient cases to analyze this variable.

Other Measures

The instruments attempted to address the additional proposition of potential relevance which was not incorporated in the model at the outset. The proposition stated that the greater the intelligence of an organizational incumbent, the greater his influence upon the process of change. Influential members were identified by the following question in the policy, planning, and training instruments:

What members of the department were most influential in the development of these (policy, planning, training) changes?

a. What is their position in the organization?

b. Why were they influential?

Organizational incumbents having intelligence were identified by determining the specific individuals who gathered or had access to existing organizational intelligence. Thus the policy, planning, training, and liaison instruments attempted to determine factors such as who specifically made site visits, attended seminars or conferences, examined plans, publications and other data. The research question was to what degree individuals possessing intelligence played influential roles in the development of changes.
In conclusion, this chapter has attempted to elaborate the methodology employed in the study. Advantages and disadvantages of the cases selected for analysis were first discussed. This was followed by a presentation of the data collection techniques utilized and a general account of associated problems. The remainder of the chapter concerned specification of the measurement of model and other relevant variables. Methodological difficulties are inherent to any empirical examination of organizational process, particularly when change is the focus of analysis. As can be seen from the preceding discussion, this study was no exception. Several measurement and other methodological problems were confronted. However, the direction provided by the model allowed for a more coherent examination of the phenomenon. The subtlety of the change process could be approached by theoretically generated concepts and variables. The next chapter shows how this was accomplished.
1. For example, if the chief chose resources in one organization and planning in another, there might be fewer change areas discussed in the latter organization.

2. In police departments, the chief chose planning, training, or community relations in all but two cases. In those two cases, the chiefs chose emergency interorganizational relationships, but only as they related to planning. Consequently no comparability was lost here, although the overlap did enhance the quality of the data. In fire departments, emergency interorganizational relationships was chosen three times, but, here again, only as it related to planning.

3. Data for measurement of the following indicators was derived from the following two sources: "Riots, Civil and Criminal Disorders: Part 13," from Hearings Before the Permanent Sub-committee on Investigation of the Committee on Government Operations, The United States Senate, Ninetieth Congress, pp. 2762-2777; and Riot Data Review (Waltham, Mass.: Brandeis University, Lemberg Center for the Study of Violence, reports from April 1968; May 1968; May-August 1968; January-December 1969).


5. The following criteria were utilized for all reported incidents: If a community reported a riot connected death, it was automatically included as an event. Otherwise, two or more of the following conditions had to be met: (1) two or more injuries, (2) sniping, (3) looting, (4) twenty or more fires, (5) fifty or more arrests. These criteria were taken directly from "Riots, Civil and Criminal Disorders: Part 13, pp. 2762-2777.

6. The organizations were first ranked in terms of number of articulated problems. If there were any tied ranks, an average score on the rating question for each organization was utilized to break the ties.

7. Four pairs of consecutive rankings switched places in fire departments largely on the basis of more elaborate planning, training, and community relations programs. In police departments, two tied ranks were broken and one rank was slightly changed on the basis of formalized feedback from experience in the former two cases and an elaborate community relations program in the latter.
8. One tied rank in police departments and two tied ranks in fire departments were broken in this way.


10. In both police and fire departments, those highest on comparative reference could be readily discriminated by the specific number. Those lower on comparative reference linkage, required discrimination by use of the rating question.

11. The rating question resulted in numerous tied ranks. These were resolved by interview data where possible.

12. Tied ranks were more frequent in fire departments; thus great reliance was placed upon the additional measures in these organizations.


CHAPTER V

THE EMPIRICAL EXAMINATION

The entire range of data analysis completed in the study is summarized in this chapter. The underlying concepts have been defined; model propositions have been presented and their conceptual logic elaborated; and the measurement of model variables has been specified. The study now moves to empirical examination. It should be stated again that the sample and the nature of the data did not allow for multi-variate analysis or statistical inference. The samples should be treated as populations of police and fire departments. Several indicators for variables were measured, some successfully and some not. As a result ordinal distinctions can be made with some confidence, but the data can not be legitimately treated as interval level. Given the newness of the model, the exploratory nature of measurement is felt to be relatively successful.

Specification of organizational rankings on both model and structural variables will first be presented in table form. This will be followed by an elaboration of the model through correlation analysis. The model will then be more clearly illustrated by case description of several organizations in the population. Discussion of anomalous cases will be included here. The chapter will conclude with an assessment of the intelligence-influence hypothesis, thus providing
an additional possibility for refining the model. In sum, the
objective is to use the following analysis as a basis for expansion
of the theory in the final chapter of this work; incorporating new
hypotheses and suggesting new research directions.

**Specification of Rankings**

The following tables specify the rankings for both model and
structural variables analyzed in police and fire departments. On
the basis of these rankings, Spearman rank order correlation tech­
niques will be employed to examine the data. In presenting these
tables, the following designations for variables are employed:

- Environmental threat to charter -- Threat
- Organizational change -- Change
- Organizational intelligence -- Intell.
- Comparative reference linkage -- Com. Ref.
- Range of problem solving -- R. P. S.
- Complexity of the process of organizational change -- C. P. C.

- Size -- Size
- Wealth -- Wealth
- Professionalization -- Prof.
- Complexity -- Complex.
- Centralization -- Central.
- Bureaucratization -- Bur.
The variables will be listed horizontally and the organizations vertically in each table. For purposes of anonymity, the organizations will be designated by letters.

TABLE 2

SPECIFICATION OF ORGANIZATIONAL RANKINGS
BY MODEL VARIABLES: POLICE DEPARTMENTS

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Correlation Analysis of the Data

Analysis of Model Variables

Spearman rank order correlation techniques were used to statistically analyze the data. To facilitate discussion, table 6 and table 7 present correlation matrices for police and fire departments using model variables.
## TABLE 3

SPECIFICATION OF ORGANIZATIONAL RANKINGS BY MODEL VARIABLES: FIRE DEPARTMENTS

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TABLE 4

SPECIFICATION OF ORGANIZATIONAL RANKINGS
BY STRUCTURAL VARIABLES: POLICE DEPARTMENTS

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TABLE 6
CORRELATION ANALYSIS OF THE MODEL IN POLICE DEPARTMENTS

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</tr>
<tr>
<td>Change</td>
<td>.60</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intelligence</td>
<td>.55</td>
<td>.94</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparative Reference</td>
<td>.51</td>
<td>.89</td>
<td>.91</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range of Problem Solving</td>
<td>.52</td>
<td>.91</td>
<td>.97</td>
<td>.90</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Complexity of Change</td>
<td>.58</td>
<td>.97</td>
<td>.97</td>
<td>.93</td>
<td>.94</td>
<td>--</td>
</tr>
</tbody>
</table>

The correlations show considerable support for model propositions in both police and fire departments. The mean correlation for police departments is .81, with a median of .91 and a range of .51 to .97. The mean correlation for fire departments is .77, with a median of .84, and a range of .52 to .98. Although the data shows substantial consistency, lower correlations along the threat variable clearly stand out. (They range from .52 to .60 in police and .52 to .61 in fire departments.) By removing the threat variable, the mean correlation becomes .93 in police departments, with a median of .93 and a range of .89 to .97. In fire departments, the mean becomes
with a median of .94 and a range of .78 to .98. In this case the consistency is rather remarkable.

### TABLE 7

**CORRELATION ANALYSIS OF THE MODEL IN FIRE DEPARTMENTS**

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Threat</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change</td>
<td>.57</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intelligence</td>
<td>.56</td>
<td>.98</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparative Reference</td>
<td>.52</td>
<td>.91</td>
<td>.94</td>
<td></td>
</tr>
<tr>
<td>Range of Problem Solving</td>
<td>.56</td>
<td>.78</td>
<td>.79</td>
<td>.88</td>
</tr>
<tr>
<td>Complexity of Change</td>
<td>.61</td>
<td>.95</td>
<td>.98</td>
<td>.94</td>
</tr>
</tbody>
</table>

The consistently lower correlations along the threat variable, objectively defined, is quite interesting. The implication is that in some cases change was relatively high when objective threat had not been of a concomitant nature. It was reasoned that perhaps subjective or perceived threat may have also played an important role in the process of change. To further address this question, the remaining model variables were correlated with the measures of subjective or perceived threat. Recall that inter-correlations between objective
and perceived threat were not particularly high (.43 for police and .68 for fire departments). Therefore it was suspected that the introduction of this dimension of threat might be important. The following table indicates the new correlations with the threat variable.

TABLE 8
SUBJECTIVE THREAT AND MODEL VARIABLES

<table>
<thead>
<tr>
<th>Variables</th>
<th>Police</th>
<th>Fire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change</td>
<td>.75</td>
<td>.70</td>
</tr>
<tr>
<td>Intelligence</td>
<td>.70</td>
<td>.74</td>
</tr>
<tr>
<td>Comparative Reference</td>
<td>.71</td>
<td>.76</td>
</tr>
<tr>
<td>Range of Problem Solving</td>
<td>.76</td>
<td>.87</td>
</tr>
<tr>
<td>Complexity of Change</td>
<td>.82</td>
<td>.76</td>
</tr>
</tbody>
</table>

Note that there are substantial increases in these correlations. With this change, the overall mean correlation of police departments becomes .87 with a median of .91 and a constricted range of .70 to .97. The overall mean of fire departments becomes .85 with a median of .88 and a constricted range of .70 to .98. The findings suggest that subjective threat has some relevance to the model. As civil disorder became a salient dimension in the social network of these organizations, there was greater possibility for awareness of potential threat even when a department had not experienced a major
disturbance. The present analysis indicates that to the extent the network was operative through comparative reference linkages and intelligence sources, subjective threat increased.

The particularly high correlations with the intelligence variable should be noted, e.g., change = .94 and .98, comparative reference = .91 and .94, and complexity = .97 and .98. Though zero order correlations of this nature should always be interpreted with caution, it is quite clear that this central model variable plays an important explanatory role in the process of change. Thus the concept merits continuing theoretical and empirical treatment. Taken in its entirety, the model holds together well. The high and fairly consistent correlations indicate that organization change can be fruitfully addressed with these variables and the underlying theory they represent.

**Analysis of Structural Variables**

The impact of several structural variables on the model was next assessed. Tables 9 and 10 present correlation matrices which summarize relationships between these two sets of variables. The structural variables run horizontally and the model variables run vertically.

The correlations indicate mixed results. In general, they are substantially lower and less consistent than intra-model correlations. However, the correlations are still relatively good for many of these variables, e.g., .79 for professionalization and R.P.S., and .70 for wealth and C.P.C. in police departments. The size, wealth, and complexity variables hold up well in both sets of organizations;
in addition, professionalization appears to have relevance in police departments. The centralization variable shows no association in police departments and the bureaucratization variable does not hold up as well or as consistently as the others. Centralization does show association with change in fire departments (.63), although overall, it does not correlate well with model variables.

**TABLE 9**

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>*O. Threat</td>
<td>.70</td>
<td>.58</td>
<td>.44</td>
<td>.74</td>
<td>.00</td>
<td>.11</td>
</tr>
<tr>
<td>*S. Threat</td>
<td>.15</td>
<td>.28</td>
<td>.55</td>
<td>.26</td>
<td>.53</td>
<td>.33</td>
</tr>
<tr>
<td>Change</td>
<td>.59</td>
<td>.62</td>
<td>.66</td>
<td>.52</td>
<td>.06</td>
<td>.46</td>
</tr>
<tr>
<td>Intell.</td>
<td>.56</td>
<td>.59</td>
<td>.69</td>
<td>.56</td>
<td>.09</td>
<td>.39</td>
</tr>
<tr>
<td>Comp. Ref.</td>
<td>.51</td>
<td>.64</td>
<td>.70</td>
<td>.56</td>
<td>.04</td>
<td>.61</td>
</tr>
<tr>
<td>R.P.S.</td>
<td>.54</td>
<td>.62</td>
<td>.79</td>
<td>.53</td>
<td>.04</td>
<td>.48</td>
</tr>
<tr>
<td>C.P.C.</td>
<td>.65</td>
<td>.70</td>
<td>.62</td>
<td>.60</td>
<td>.05</td>
<td>.47</td>
</tr>
</tbody>
</table>

*The letters O and S designate objective and subjective threat.

Subjective as opposed to objective threat showed generally lower association with these other structural variables. A more systematic interpretation of this difference would require another complete study. At this point it is merely suggested again that
perceived threat appears to have analytical import. However, its treatment as an organizational property requires, at the very least, a more extensive sampling of organizational incumbents.

TABLE 10

FIRE DEPARTMENTS: CORRELATION ANALYSIS OF MODEL WITH STRUCTURAL VARIABLES

<table>
<thead>
<tr>
<th>Variables</th>
<th>Size</th>
<th>Wealth</th>
<th>Complex</th>
<th>Central</th>
</tr>
</thead>
<tbody>
<tr>
<td>*O. Threat</td>
<td>.78</td>
<td>.76</td>
<td>.76</td>
<td>.37</td>
</tr>
<tr>
<td>*S. Threat</td>
<td>.55</td>
<td>.55</td>
<td>.52</td>
<td>.56</td>
</tr>
<tr>
<td>Change</td>
<td>.61</td>
<td>.69</td>
<td>.60</td>
<td>.63</td>
</tr>
<tr>
<td>Intell.</td>
<td>.60</td>
<td>.63</td>
<td>.59</td>
<td>.31</td>
</tr>
<tr>
<td>Comp. Ref.</td>
<td>.61</td>
<td>.61</td>
<td>.52</td>
<td>.26</td>
</tr>
<tr>
<td>R.P.S.</td>
<td>.52</td>
<td>.55</td>
<td>.36</td>
<td>.49</td>
</tr>
<tr>
<td>C.P.C.</td>
<td>.62</td>
<td>.65</td>
<td>.58</td>
<td>.29</td>
</tr>
</tbody>
</table>

*The letters O and S designate objective and subjective threat.

These findings indicate that although the additional organizational variables appear to have less explanatory importance in the analysis of organizational change (relative to those in the model), some provide interesting directions for expansion of the theory. As this is the goal of the next chapter, the logic for their inclusion will be an important issue at that time. There seems to be considerable empirical justification for their employment.
Case Descriptions

A few case illustrations will now be presented to more fully elaborate the model and other findings. Cases which represent high and low extremes on the model for both police and fire departments will be summarized. In addition, cases will be highlighted which are somewhat unique, i.e., organizations which had relatively high threat but low change and vice versa.

Police Department Case Analyses

Organization B: High Threat - High Change

By way of introduction, Organization B had the following ranks on each of the model variables. As can be seen, the organization typifies the high extreme on the change model.

Objective Threat - 2
Change - 2
Intelligence - 2
Comparative Reference - 3
Range of Problem Solving - 2
Complexity - 2

There was considerable objective threat during the period 1965-1969. The surrounding city experienced 7 civil disturbance events and a total of 31 days of civil unrest. During this unrest, there were at least 6 deaths, several hundred injuries, approximately 1,000 arrests, over 40 injuries to police and fire personnel, and property damage in excess of $3,000,000. This objective threat was matched
by an equally high perceived threat score (a rank of 2.33).

Organization B underwent dynamic change during this same period. For example, detailed civil disturbance planning was formally staffed as of 1966 and all plans were revised yearly. Crowd control became a formalized aspect of both recruit and in-service training. In addition, 43 hours of community relations training was developed and formalized for recruits and 16 hour community relations workshops were established at the in-service level. The organization created a specialized subunit for community relations, staffed it with 7 full time personnel (and numerous part time precinct level personnel), and developed over 20 new programs.

Comparative reference was extensive as the organization maintained contact with departments from 32 major cities in the United States with the specific intent of exchanging information about mutual problems. The department also had extensive state wide contacts, most often for the purpose of exchanging training bulletins.

Intelligence gathering specific to the civil disturbance area was substantial. The organization made frequent use of site visits, conferences and seminars, other civil disturbance plans, and numerous police and other professional journals. Furthermore, after-action reports were mandated for all civil disturbance operations, thus insuring formalized feedback from experience. Formal feedback from outside intelligence was also required. Detailed written and verbal reports prepared after all site visits, conferences, and seminars were fed into appropriate committees. The organization also
maintained data files in the training academy, research and development section, and police library.

The range of problem solving appeared to be quite broad. All respondents indicated that a great deal of time was spent considering possible courses of action in the development of changes. For example, the merits of several different procedures for interorganizational coordination were analyzed by the permanent emergency planning committee. Several other alternatives were elaborated for various phases of planning. In the community relations area, elaboration of over forty possible programs was given to interviewers by the director. Only twenty of these programs were then existent in the organization.

In terms of complexity, at least twelve subunits were directly involved in the development of change, an associated sixteen persons had substantial participation, and at least twelve others played an evaluative role. Since most related aspects of civil disturbance were formally staffed, there were numerous standing committees and meetings. For example, when the emergency plan was initially developed, a planning committee was permanently established and sub-committees were created to draft various parts of the plan, thus increasing bureau wide participation. All subsequent revisions were coordinated by the permanent planning committee.

Structurally, the organization ranked fourth in size, fifth in wealth, third in professionalization, third in complexity, twelfth in centralization and thirteenth in bureaucratization. These findings indicate the possible relevance of size, wealth, professionalization,
complexity, and a decentralized decision making structure for the process of change. For example, there was, in fact, widespread involvement in the development of changes and decision making appeared to be highly decentralized.

In sum, this case illustrates model predictions for high organization change, i.e., substantial objective threat, an extensive comparative reference linkage, elaborate intelligence gathering and use, an expanded range of problem solving, a complex process of change, and an associated high degree of objective organizational change.

**Organization J: Low Threat - Low Change**

This organization does not represent the low extreme on all variables, but it does provide an interesting example. Organization J had the following ranks on each of the model variables:

- Objective Threat - 13
- Change - 11
- Intelligence - 8
- Comparative Reference - 9
- Range of Problem Solving - 9
- Complexity of Change - 11

Direct civil disturbance experience was virtually non-existent for this organization. It had no single incident which met the criteria for a civil disturbance event. There were a few one or two day periods in which some potential for unrest existed. In these cases, some crowd formation occurred, some arrests were made, a few minor
fires were reported, but nothing more. The organization also scored low on the subjective threat dimension (11).

Although ranked low on the change variable, the organization did make some specific civil disturbance related adjustments. For example, a specific civil disturbance plan was developed. The plan was not elaborate, but it did provide general statements of responsibilities and a lengthy series of lists which specified relevant resources and their locations. The department also formalized training at the recruit and in-service levels which included crowd control, equipment use, and community relations. Over forty pages of relevant training bulletins were developed in less than a two year period.

The question becomes why was there this much change under conditions of relatively low threat?

The answer may have been in terms of comparative reference and intelligence. The organization had a much higher ranking on these variables (eighth and ninth). Organization J maintained relatively frequent contact with at least seven cities, most of which had some civil disturbance experience. In general, regular comparative reference appeared to be restricted to two or three contiguous states. The department also gathered substantial amounts of intelligence. For example, at least six site visits were made and six civil disturbance related conferences and seminars attended during the four year period. In addition, a minimum of six civil disturbance plans were examined and several relevant publications used on a continuing basis. The changes clearly reflected the use of this intelligence as incumbents who gathered the information also developed the changes.
The range of problem solving appeared to be moderate. In the planning area, most consideration was given to delineating responsibilities; the rest was perfunctory. Training appeared to generate a greater range of alternatives. The intelligence in this area was more extensive and provided, as respondents indicated, various techniques to consider. The complexity of change was relatively low; four subunits were involved, but most of the work was done by two men who formed a standing committee. Their effort began on a part-time basis and subsequently was formally assigned. A few other staff members gave assistance from time to time, e.g., in developing equipment lists.

Structurally, the organization ranked fourteenth in size, fourteenth in wealth, eighth in professionalization, eleventh in complexity and bureaucratization, and thirteenth in centralization. The interesting point here is the relatively high rank on the professionalization variable. This finding may help to explain the fact that intelligence and comparative reference existed in some magnitude. One might argue that intelligence gathering and comparative reference imply normative dimensions of professionalism and change, in this case, was the outcome of this orientation.

In sum, this case presents important insights for the model. Both threat and change were low relatively, but intelligence, comparative reference, and professionalization appeared to have considerable relevance where change did occur. The case thus provides support for the inclusion of professionalization as an additional model variable.
Organization N: High Threat - Low Change

The following is clearly an anomalous case. With the exception of high objective threat, Organization N ranked very low on all of the model variables.

Objective Threat - 5
Change - 14
Intelligence - 13
Comparative Reference - 13
Range of Problem Solving - 14
Complexity of Change - 13

The surrounding community had experienced three civil disturbance events for a total of nine days. This objective threat was matched by a relatively high perception of threat on the part of respondents (7.5 ranking). The interesting factor about these events was the immediate call-up of the national guard, in two cases before the department itself was mobilized in any complete sense. This is an important point and will be referred to later.

As stated, the organization experienced little change, both relatively and absolutely. There was no formal civil disturbance planning of any kind. There was some crowd control training, but it was unsystematic and few organizational personnel received it. A new community relations unit was established but it was disbanded after only three months operation. Though not used until 1970, a twelve week specialized training course was developed in 1969. This course covered both crowd control and community relations and was to be given to fifty men.
The organization was equally low on the comparative reference and intelligence variables. The department maintained a few statewide police contacts, but that was the extent of regular comparative reference linkage. Intelligence was predominantly in the form of two or three police publications and several training seminars. There was no formalized feedback system for either outside intelligence or direct civil disturbance experience.

Alternatives consideration was quite low although some thought was given to various community relations techniques and a few types of emergency call-up procedures were discussed. The organization clearly depicted the low end of the complexity continuum. The chief and his administrative assistant developed the changes and no other organizational subunits were involved in any way.

The model holds up well, as predicted, with the exception of the threat variable. A key point appears to have been the fact that respondents generally defined civil disturbance as being beyond organizational capabilities. The national guard was called in very quickly under disturbance conditions for this very reason. If organizational capability was quite low, then at least some insight should lie in rankings on the structural variables.

The organization ranked twelfth in size, twelfth in wealth, last in professionalization (N of twelve), ninth in centralization, and fifteenth in bureaucratization. Size, wealth, and professionalization specifically reflect organizational resources and were quite low in this case. The organization was, in fact, small and operating below authorized strength. Its facilities were defined, and appeared
to be, antiquated and inadequate. Top command was determined by political patronage, thus stability may have been a problem here. It appears that respondents may have had some justification in their assessment of the organization's ability to respond during unrest. In sum, the case is negative in terms of the objective threat dimension, but supplies substantial support for remaining model inter-relationships. The case also provides justification for expansion of the theory.

Fire Department Case Analyses

Organization C: High Threat - High Change

The following were the specific ranks on the model variables:

Objective Threat - 2
Change - 3
Intelligence - 1
Comparative Reference - 3
Range of Problem Solving - 2.5
Complexity of Change - 1

Objective threat was major for this fire department. The surrounding city had 5 civil disturbance events totalling 24 days; one was perhaps the most devastating to occur in the United States. These events had an associated 11,258 arrests, 47 deaths, 353 injuries, 6 deaths and 153 injuries to police and fire personnel, and over $44,000,000 in property damage. The organization's ranking on perceived threat was equally high (2.5).
Environmental threat was accompanied by extensive organizational adjustments in all change areas. Planning was comprehensive, detailed, and programmatic in terms of alternative operational procedures. New training, developed at both the in-service and recruit levels, included riot simulations. Though no formal community relations unit was established, the organization developed two or three community relations programs as a direct result of riot experience.

Comparative reference linkage and intelligence gathering were quite pronounced. With regard to the former, the organization not only maintained contact with departments from major cities, but had become an important intelligence resource for many of them. Extensive use was made of all intelligence outlets as evidenced by the top score on that variable. In addition, the department produced a large volume of written material concerning its own riot experience. Understandably, the organization relied greatly upon its own informational feedback, yet made great efforts to collect and file outside data.

The range of problem solving was quite broad. Alternative courses of action were considered in such areas as protection of firefighters, riot training, command post locations, and the laying out of operational task forces. In terms of complexity, at least six sub-units participated in the development of changes with an associated twelve to fifteen people. Planning alone took well over three months to initially formulate.

Structurally, the organization ranked second in size, second in wealth, and second in complexity, thus illustrating the potential
relevance of these variables in fire departments as well. A ranking of third in centralization typifies the relatively high overall correlation of this variable with organizational change (.63). This finding highlights an interesting difference between police and fire departments. Police departments showed absolutely no correlation between centralization and any model variable, while fire departments did indicate some association, particularly with the change variable. If centralization is an important factor in fire departments, then one might expect the change process to be centralized. This question will be examined more closely at the end of this chapter by examining the intelligence-influence hypothesis. In conclusion, the organization presents an excellent example of model predictions and suggests again the importance of theoretical expansion.

**Organization N: Low Threat - Low Change**

This organization represented the low extreme as illustrated by the specific ranks on the model variables:

- **Objective Threat** - 15.5
- **Change** - 14
- **Intelligence** - 14
- **Comparative Reference** - 13
- **Range of Problem Solving** - 12
- **Complexity of Change** - 14

By established criteria, organization N had no direct civil disturbance experience during the 1965-1969 period, and experienced
nothing more than a few minor incidents. The community's 7 percent minority population was mostly Mexican American. Although change was quite low, some civil disturbance planning took place. This planning covered emergency call-up and task force operation, but in very simplistic form. There were some minor equipment changes, but no new developments in training other than one simulation developed and staged by the national guard.

Comparative reference and intelligence existed on a very small scale. Respondents listed only four inter-departmental contacts and these were not on a continuing basis. Two training seminars, three plans, and two publications represented the extent of intelligence gathering. A number of ideas were presented and evaluated with regard to task force locations, but this represented the total range of problem solving. Only two subunits were involved in the development of change, totalling three people; thus complexity of change was quite low.

Structurally, the organization ranked fourteenth in size and wealth, eleventh in centralization, and 14.5 in complexity. Thus the pattern continues, i.e., low scores on size, wealth, and complexity are associated with low scores on model variables and vice versa. The centralization variable is consistent because in this case decentralization is associated with low change. You will recall that high centralization and high change was found in Organization C.

Summarizing, the model predictions hold up well for this case. It is interesting that change, though quite low, still encompassed a specific civil disturbance plan and riot simulation training. As
far as can be determined, the major impetus for these changes was written material obtained from the Los Angeles Fire Department concerning the Watts riot. Thus outside intelligence, mediated by a comparative reference linkage, had the effect of producing change in this very low threat case.

**Organization D: Low Threat - High Change**

The final case illustrates the other major anomaly in this study. The following summarizes the variable rankings:

- Objective Threat - 10
- Change - 5
- Intelligence - 5
- Comparative Reference - 5
- Range of Problem Solving - 4
- Complexity of Change - 4

Although not ranked relatively high, there was objective threat as the surrounding city experienced one disturbance lasting 3 days. There were 222 arrests, 3 deaths, 48 injuries, 27 injuries to police and fire personnel, and approximately $250,000 in property damage. The organization's ranking on subjective threat was about the same (ninth).

Organizational change was rather pronounced. For example, in the planning area, a comprehensive, systematic and remarkably succinct operational manual was developed. This manual became a formalized aspect of recruit training and a basis for biannual in-service testing as well. Furthermore, several simulations had resulted in
refinement of task force and other riot procedures.

There was considerable comparative reference and intelligence gathering activity. The former existed locally, regionally, and nationally. (The chief was a member of a national fire departments' association.) The department utilized all intelligence outlets on a regular basis, filed this material in the training academy, and formally critiqued their own civil disturbance operation.

Alternatives consideration was elaborate, particularly in the area of planning. It was clear that intelligence resources were instrumental in this process. At least five subunits were directly involved in the development of changes and an associated seven to nine people participated on a systematic basis. It was further estimated that 450 man hours were expended in the development of planning and training changes. Thus the change process was relatively high on the complexity scale.

Structurally, the organization ranked ninth in size, ninth in wealth, and 12.5 in complexity and first in centralization. Based upon the previous case illustrations, one might have expected higher ranks on size, wealth, and complexity. As no convincing argument can be made for centralization at this point, we return again to the model. Threat was low but clearly present. We suspect that this threat factor, combined with a facilitating comparative reference network, resulted in substantial intelligence gathering. This intelligence was subsequently used in the development of organizational changes.
It is hoped that these illustrations have further elaborated how consistently model variables hold together from case to case. As the statistical analysis indicated initially, the threat variable presents some interesting anomalies. The case illustration should have provided tentative explanation for them. The examples also point out more cogently the possibility for expansion of the model. This is, of course, a major goal of theory development.

The Intelligence-Influence Hypothesis

This proposition, though not in the model directly, was of some relevance. The proposition states that the greater the intelligence of an organizational incumbent, the greater his influence in the development of organizational changes. Analysis of this proposition sheds some light on the uses put to intelligence as well as its degree of centralization. The following four factors were used to examine the data:

1. The proportion of influentials who were intelligence boundary personnel.
2. The proportion of intelligence boundary personnel who were influentials.
3. The proportion of influentials below the top three command levels; and the proportion of these who were intelligence boundary personnel.
4. The proportion of intelligence boundary personnel below the top three command levels; and the proportion of these who were influentials.
Factor 1 essentially addresses the role of the "expert" in the development of organizational changes. If intelligence is an important analytical dimension, then the proportion should be relatively high. In police departments, 80 out of 110 identified influentials or 73 percent were intelligence boundary personnel; in fire departments, 50 out of 83 influentials or 71 percent were intelligence boundary personnel. This data indicates that the "men of knowledge" played a disproportionate role in the development of organizational changes. ⁵

Factor 2 looks at the question of intelligence uses. The loss of intelligence represents an "intelligence pathology." ⁶ In other words, to what extent was usable technical information wasted in organizational activities. In police departments, 80 out of 122 or 66 percent of intelligence boundary personnel were influentials; in fire departments, 50 out of 59 or 85 percent of intelligence boundary personnel were influential. These findings indicate that although intelligence was an important factor for change, there still were intelligence losses, particularly in police departments. ⁷

Factors 3 and 4 look at the centralization of influence and intelligence. With regard to Factor 3, 33 out of 110 or 30 percent of influentials in police departments were below the top three command levels, and of this figure, 21 or 63 percent were intelligence boundary personnel. In fire departments, 3 out of 89 or 3 percent of influentials were below the top three command levels, and of this figure, one or 33 percent were intelligence boundary personnel.

Summarizing the results from Factor 4, 29 out of 122 or 24 percent
of intelligence boundary personnel in police departments were below the top three command levels; of this figure, 21 or 73 percent were influentials. In fire departments, 2 out of 59 or 3 percent of intelligence boundary personnel were below the top three command levels; of this figure, one or 50 percent were influentials.

The results were therefore mixed. Both intelligence and influence were clearly centralized in fire departments. It is logical to assume that in this case authority position was pre-requisite for intelligence boundary roles and that top command people developed organizational changes. At a gross level, this is consistent with the overall centralization measure in fire departments. Recall that centralization was positively correlated with model variables, in some cases fairly high (e.g., .63 with organizational change). The conclusion in this organization is that the greater the centralization of organizational decision making, the more centralized will be the process of change. Thus decision making under change conditions is an extension of normal organizational affairs. Of course, this hypothesis should be more systematically examined in subsequent research.

The situation in police departments was somewhat different. Relative to fire departments, intelligence and influence were clearly more decentralized. And where lower echelon personnel were involved in the change process, an intelligence boundary role of some kind appeared to be an important factor in their involvement. However, on the whole, police departments were centralized as well. Thus the pattern is generally the same, i.e., authority position was pre-requisite for both intelligence boundary and influence. There was
no association in police organizations between centralization generally and other model variables. Speculating as to other possible explanatory factors, both police and fire departments are para-military structures with rather strict hierarchies. This type of organization may preclude a more decentralized change process. However, the fact that many police departments are undertaking a more "professional" as opposed to "military" orientation to police work may help explain the existence of some decentralization. This decentralization appeared to be extensive in some cases in this population. At any rate, it appears that the degree of centralization of intelligence and influence is an important factor which should be considered in the refinement of the model.

Conclusion

This chapter has elaborated the entire analysis of the study as succinctly as possible. The attempt was to determine how well the model fit the data, i.e., the degree to which the analytical tools provided apprehended the process of change in these organizations. Model propositions were first analyzed and positive and relatively consistent results were found. Where deviant cases existed, efforts were made to provide some insight into the reasons for them. Several structural variables were next introduced and tentatively assessed in terms of their possible relevance to the theory. This was followed by a series of brief case studies which further elaborated the statistical treatment of the data. Finally, the relationship between intelligence boundary personnel and influence in the process of change
was examined. In this regard, the importance of intelligence as a property of change was supported and the relevance of considering degrees of centralization of intelligence and influence determined.

What kind of picture emerges about change in crisis relevant organizations that are confronted by environmental uncertainty and threat? It seems clear that both objective threat and a perception of threat to charter responsibilities precipitates some form of organizational response. In many cases this response results in significant organizational changes; changes in policy, planning, training, resources, community relations, etc.

It is also evident that the development of changes requires certain types of knowledge and information. What should a civil disturbance plan include? What can new training techniques accomplish? What are associated equipment needs? What policies should be established? How do you develop a community relations program? What problems will this program address? Questions such as these represent distinct intelligence needs; some which are fulfilled internally (e.g., knowledge, experience) and some which must clearly be mediated through the environment (e.g., comparative reference).

In these populations of organizations increasing amounts of intelligence, activated by some definition of civil disturbance threat, were associated with increasing amounts of change. Furthermore, the existence or activation of comparative reference linkages, as a source of intelligence, were also an impetus to change.

How should the process of change be conceptualized? In this study change was viewed as an intelligence processing organizational
activity. In other words, it was argued that changes were developed through a process of gathering, interpreting, and evaluating intelligence as a basis for deciding among organizational options. It was hypothesized that as intelligence increased, the range of alternatives consideration would be broadened, and the actual development of change would become increasingly complex. These organizations rather clearly represented the hypothesized pattern; as intelligence increased, problem solving expanded, more incumbents and organizational subunits became involved, more time was expended, and more organizational mechanisms were created to develop changes.

The research also showed that existing organizational dimensions may be important in the process of change. For example, size is not only an intelligence resource, but is also a potential pool of intelligence boundary personnel. Wealth represents a resource for intelligence gathering. Professionalization implies an expanded human potential as well as providing a normative impetus for intelligence search. A complex organization structure demands a complex orientation to organizational problems such as those generated by civil disturbance threat.

Finally, it appears that the uses put to intelligence is very important. Who plays intelligence boundary roles? What is their position in the hierarchy? Are intelligence boundary personnel influential in the process of change? This research indicated that intelligence and influence go hand in hand, but that in some cases intelligence losses occur. The research also determined that in many cases, particularly in fire departments, authority position was
a pre-requisite for both intelligence boundary and influence in the development of change.

These are some of the major findings of the study. The purpose of this or any theoretical model is to incorporate factors such as these in a coherent fashion. This model initially propositionally related the following six factors: environmental threat to charter, organizational change, organizational intelligence, comparative reference linkage, range of problem solving, and complexity of the process of change. The final chapter will draw upon the preceding analysis as a basis for expanding the model and providing directions for more systematic verificational research.
FOOTNOTES: Chapter V

1. With regard to the threat variable, the rankings refer to the objective measurement of threat as defined by civil disturbance history. In developing the model, this was considered to be the prime measure of threat.

2. Bear in mind, however, that the measure of subjective threat is admittedly crude. Its full fledged treatment as an organizational property requires considerably more aggregated data based upon incumbent perceptions.

3. This course was subsequently initiated through federal funding.

4. This was a particularly salient issue because the department had experienced numerous injuries and two deaths during disturbances.


6. See Wilensky, Organizational Intelligence, Chapter III.

7. Possible distortion in this data is recognized. For example, information gained by intelligence boundary personnel may have been used even though these specific individuals were not involved. For example, detailed reports were often made by officers who made site visits and then subsequently used by others to make changes. This mitigates intelligence loss, but the data does not reflect this factor.

8. The hope was to more systematically analyze this hypothesis with present data. Influence and intelligence were so completely centralized in fire departments (only 3 of 89 influentials and 2 of 59 intelligence boundary personnel were below the top three command levels) as to make independent discrimination impossible. The problem was the same in police departments, i.e., too many police departments had the same score on this variable to allow for ordinal discrimination. An attempt was made to nominalize the data (create discrete categories) but with no success. It was concluded that the data simply did not allow for more systematic analysis of this hypothesis.

9. The analysis attempted to determine if decentralization was associated with professionalization by looking only at those police departments which were high on the professionalization variable. Unfortunately, the results were similar to those overall. Of
course, this was not an adequate test. It must be remembered that professionalization has both a structural and attitudinal dimension. This has been pointed out clearly by Richard Hall, "Professionalization and Bureaucratization," *American Sociological Review*, 33 (Feb. 1968): 92-104. Both of these measures should be tapped in order to fully analyze this variable.
CHAPTER VI

CONCLUSION

The purpose of this study has been to conceptualize and empirically examine the process of organizational change under conditions of environmental uncertainty. The phenomenon was conceptualized as an intelligence processing organizational activity and a theoretical model based upon this central concept was developed. During the research phase, the measurement of relevant variables was explored in order to assess the model's explanatory potential. Analysis of the data indicated quite clearly the importance and relatively consistent relationships among model variables. It was therefore concluded that the theory, as developed, merited further attention.

There are essentially three objectives in this final chapter. First, several points made earlier concerning expansion of the model will be synthesized. Second, some suggestions for more systematic verificational research will be elaborated. The primary objective in this regard is to indicate possibilities for improved measurement of variables, thus allowing for interval level analysis. Third, future research goals through which the implications of this study's findings can be pursued will be discussed.
Expansion of the Theory

Several suggestions for model expansion were mentioned in the preceding chapter. Although a great deal of empirical analysis is still needed, it seems justified to tentatively expand the model to include other dimensions. Expansion of deductive theory must derive from the introduction of additional basic propositions. These new basic propositions will now be delineated along with the logic for their inclusion in the model.

1. The greater the perceived environmental threat to organizational charter, the greater the degree of organizational intelligence.

This proposition reflects the finding that threat has both an objective and subjective referent. It was indicated that perceived threat correlated substantially higher with remaining model variables than did objective threat. Thus organizations with relatively low civil disturbance experience made, in some cases, substantial organizational changes based upon a defined potential for problems in this area. It was reasoned that this was, at least in part, a function of comparative reference linkages and more generally a facilitating social network. Civil disorder became a topical focus in regional and national meetings, seminars, various publications, personal and interdepartmental contacts, etc. In short, civil disturbance was a salient dimension in the social networks of both police and fire departments during the period 1965-1969.
2. The greater the degree of organizational intelligence, the less centralized the process of organizational change.

Centralization of the change process is defined as the degree to which influence and intelligence are restricted to top command levels. Assuming that top command levels have generally fewer incumbents, it is argued that an increasing volume of intelligence expands beyond these levels participation in its processing and use. Taken as a whole, it was found that influentials and intelligence boundary personnel were centralized in both police and fire departments. This finding was unequivocal in fire departments, but some police departments had clearly decentralized influence and intelligence. Unfortunately, it was impossible to more systematically analyze departments as independent cases; this would have allowed determining more clearly the direction of the relationship. The hypothesis is stated as an inverse relationship on logical grounds primarily. Thus as intelligence increases, it is suspected that there will be a concomitant increase in the number and status range of personnel playing boundary roles because of the sheer volume of intelligence to be processed; and an expansion in the number and status range of influentials as a reflection of rational use of organizational resources.¹

3. The greater the organizational size, the greater the organizational intelligence.

4. The greater the organizational wealth, the greater the organizational intelligence.
5. The greater the organizational professionalization, the greater the organizational intelligence.

These three variables (size, wealth, professionalization) all reflect organizational resources having a bearing upon the amount of intelligence existent within organizations. Increasing size represents an intelligence resource as well as an expanded pool of intelligence boundary personnel. Wealth indicates a material resource for intelligence gathering and allocation. Professionalization reflects an expanded human resource, but also provides an impetus or normative orientation for intelligence search as well. In the populations of organizations these variables correlated fairly consistently with other model variables, thus supporting the logic for their inclusion in the theory.

6. The greater the organizational complexity, the greater the organizational intelligence.

The findings indicate that complexity was of some relevance to the model in both police and fire departments. It appears that a complex structure demands a complex orientation to organizational problems. For example, elaborate planning was done at the command, bureau, and precinct levels in one highly complex police department. The purpose of this planning was to maintain total organizational coverage. In this case complexity resulted in increasing amounts of intelligence gathering because each of these levels had intelligence demands. It is suspected that cases such as this reflect a general pattern.
The centralization and bureaucratization variables are not included as basic propositions. The findings indicated that centralization had a very ambiguous connection with the model. There was virtually no correlation in police departments and highly inconsistent findings in fire departments. Bureaucratization was not measured in fire departments and did not correlate highly or consistently in police departments. No strong case for their inclusion into the theory can be made at this point. However, it is suggested that continuing efforts be made at measurement so that more adequate assessment of their relevance will be possible.

These several dimensions obviously do not exhaust the range of structural properties which could and perhaps subsequently should be analyzed. For example, the variables of formalization, stratification, differentiation, autonomy, conflict, efficiency, effectiveness, job satisfaction, etc., have been researched at one time or another in the discipline. There is likely to be conceptual and empirical argument for the later inclusion of some of these. In addition, each of these properties involves a particular measurement problem. Parsimony dictates the necessity for closure as we attempt to advance theoretically sound knowledge about change. The variables advanced so far appear to have direct relevance, indicate considerable interdependency, and can be expeditiously measured in most cases. And, these variables alone provide much with which to work and build.

The following are the basic propositions in the expanded model.

1. The greater the objective environmental threat to organizational
charter, the greater the organizational intelligence.

2. The greater the perceived environmental threat to organizational charter, the greater the organizational intelligence.

3. The greater the comparative reference linkage, the greater the organizational intelligence.

4. The greater the organizational size, the greater the organizational intelligence.

5. The greater the organizational wealth, the greater the organizational intelligence.

6. The greater the organizational professionalization, the greater the organizational intelligence.

7. The greater the organizational complexity, the greater the organizational intelligence.

8. The greater the organizational intelligence, the greater the organizational change.

9. The greater the organizational intelligence, the broader the range of problem solving.

10. The greater the organizational intelligence, the more complex the process of organizational change.

11. The greater the organizational intelligence, the less centralized the process of organizational change.

The introduction of these propositions expands the total model to sixty-six propositions as there are now fifty-five possible derivations (see Appendix E). For example, the greater the organizational professionalization, the more complex the process of organizational change; the greater the organizational size, the less
centralized the process of change. And so forth. Most of these propositions have been tentatively examined in this research. An objective of future research will be to more systematically test these hypothesized relationships.

**Future Verificational Research**

Future verificational research should have two major goals: an overall assessment of the utility of the model; and more importantly, a systematic examination of causality. Of existing methodologies, path analysis appears to be a most appropriate technique for meeting these objectives.² Causality demands the specification of a dependent variable and the determination of the direct effect of each independent variable (assumed to exist prior in time). Path analysis has been specifically designed to perform this function. In this case, objective organizational change will be the central dependent variable and the effort will be to isolate the direct and indirect effect of each of the remaining model variables.³ A resulting high degree of total variance explained would allow for causal inference of considerable credibility.⁴

The preceding paragraph outlines an extremely demanding research task. However, based upon what has been learned in this study, it is felt that this research can now be undertaken. Two essential problems will have to be solved: the requirement of interval level measurement⁵ and a more representative sampling of police and fire departments.

With regard to interval level measurement of model variables, the following conclusions and suggestions from this research are
offered for consideration. It was concluded that it is analytically useful to distinguish between objective and subjectively defined dimensions of environmental threat to charter. There were several possible interval measures for the former, of which number of days of civil unrest appeared to be most discriminating. However attempts should be made to determine inter-correlations among several related measures, the result being a more comprehensive index. Perceived threat can be measured, as was done, with a rating question. However, any such scale should be more elaborate than that used in this study; measuring perceptions about various civil disturbance related problems; and aggregating scores from a larger number of organizational respondents. In this way the final measurement would more truly represent an organizational property.

The present study relied a great deal upon checklists and interview elaboration to measure the change variable. As a result, it was only possible to make ordinal distinctions. The number of items marked on the checklist could have been employed as an interval measure of change, but this assumes equal value for all items. This simply was not the case objectively. However, there may be underlying unidimensionality in the various types of change. For example establishing a community relations program may also represent or subsume other types of changes as well. If this is true, Guttman type scale analysis will yield a far more adequate measure of organizational change. A second possibility is to weigh various items on some scale of change magnitude (e.g., a civil disturbance plan is worth so many points). Of course, the assumptions and criteria for the scale would have
to be clearly specified. As there are many problems inherent in this approach, it is suggested that attempts be made first to test for unidimensionality.

With regard to comparative reference, the specific number of contacts appears to be a far better measure than a simple rating question. But, the term "regular contact" needs to be more clearly specified (e.g., one per month, one or two per year, etc.). A broader range of organizational incumbents is also required to have complete confidence in this measure as an organizational property.

Several indicators of intelligence were measured in this study, thereby tapping various relevant intelligence sources. An aggregate score assumes equal value for each intelligence source (e.g., a site visit has the same value as a publication). This assumption, though problematic, must be made if this aggregate score is to be utilized as an interval measure. Here again, scalegram analysis for unidimensionality might be tried as an alternative. Another possibility is the total organizational expenditure for the intelligence function. This figure might be extracted from organizational records.

The indicators for range of problem solving were not totally satisfactory and it is felt that much improved measurement is possible. Experience indicates that each of the change areas imply a series of alternative courses of action. It is suggested that a checklist of alternatives be developed for each change area and an appropriate rating question (similar to the one used in this study) be used for each item. In this manner, a specific rating is obtained for the several alternatives in each change area. This procedure allows for
a more precise measurement of the range of alternatives consideration as well as insight into the relative importance given to various courses of action.

The primary measure for complexity of the change process, i.e., the number of subunits involved in the development of changes, was basically sound. The question is making sure that subunit participation is fully examined for each change area. This study relied upon a very small number of respondents in most cases. It will be necessary to run crosschecks for the identification and nature of participation in order to increase confidence in this measure. It will also be necessary to establish criteria for degrees of participation.

Centralization of the change process is a new variable and an index based upon the extent that intelligence and influence are restricted to top command levels of the organization is suggested. The cut-off points, though arbitrary, do not involve many logical problems. The measures become the proportion of intelligence boundary personnel and influentials in the top command levels. Intelligence and influence may be independent dimensions of centralization. This, of course, is an interesting empirical question worth examining. It is suspected, however, that they will show considerable co-variation. Furthermore, it is felt to be conceptually logical to subsume them as dimensions of a more encompassing construct.

With regard to the remaining structural variables, the author has no further suggestions to make concerning the size and wealth variables. The measures used are interval level and require few assumptions in their measurement. It is felt that professionalization
has both structural and value dimensions. The former is characterized by factors such as educational levels, organizational affiliations, publications received, etc. The latter is the normative orientation of the profession reflected by organizational incumbents. Adequate measurement of professionalization requires assessment of both these dimensions. The contributions in this area by Hall and others are a step in the right direction. If organizational complexity refers merely to an administrative dimension of organization, then the number of subunits appears to be an adequate measure. If we want to adequately measure the complexity of organizational decision making, then a more elaborate operationalization is required. Aggregate measurement of subunit involvement in various spheres of organizational decision making would be very useful. The major problem would be the costs involved in getting respondents from the various subunits.

As a general statement, adequate measurement of all the above variables in one study may be an impossible task. However, these are measurement goals worth pursuing. The explanatory potential of the model will be more fully tested to the extent that these variables are validly and reliably analyzed.

The second issue concerns the future sampling of police and fire departments. There are approximately 135 cities in the United States with a population of 100,000 or more. It seems appropriate to restrict the population to departments from these cities because civil disturbance has been primarily an urban phenomenon. Given this relatively small number, an analysis of the entire population rather than a random sample is suggested. Research costs dictate that data
collection be handled by questionnaires rather than interviewing. This study demanded in depth interviewing because the model was not studied in the past and many of the measurement efforts were exploratory. It is felt that now more precise and close-ended instruments can be employed.

Procedurally, the problems will be similar to those of the present study. The appropriate respondents must be identified and subsequently questionnaires sent to them. Since the flexibility of direct interviewing is lost, great efforts must be made at this prior identification. It may be necessary to restrict the number of change areas analyzed in order to minimize the total number of respondents for each organization. In addition, great efforts will have to be made in instrument design to incorporate the suggestions that have been made. Finally, reliability and validity questions demand a highly formalized and unambiguous wording of questions. Some pre-testing will therefore be mandatory.

In conclusion, it is felt that the research task laid out is an approachable one. There are admittedly many problems to be overcome (particularly in measurement of certain variables, e.g., professionalization, and complexity), but there seems to be excellent possibility for systematic verificational research of this middle range theoretical model.

Implications for the Continuing Analysis of Organizational Change

The preceding study has endeavored to examine the process of
change in crisis relevant organizations and the role of environmental linkages to this process. The resultant theoretical model has attempted to bridge the gap between notions of the individual decision maker developing changes to the emergent properties of organization as system undergoing patterned adaptation. The author believes that the model is truly an organizational approach to change; contributing to the literature on organizations generally, organization-environment relationships, and organizational change. The research illustrates again that organizations tend toward rationality (though imperfectly) in a dynamic environment; that as open systems, organizations are often confronted with uncertainty which affects the attainment of charter objectives; and furthermore, that it is conceptually fruitful to view resultant organization change as an intelligence processing organizational activity. It is stressed again that the theory is middle range, focusing upon crisis relevant organizations as a general class. And, the empirical examination concerned only two such organizations, i.e., police and fire departments. Several related activities are required in order to maximally pursue the implications of the findings.

Reiterating, a major task entails further verification of the model in police and fire departments. A second major goal will be comparisons across these organizations, raising additional research questions. For example, how do police and fire departments differ in terms of magnitude of change? What social network characteristics might account for this difference? What aspects of organization structure and process are contributory factors? A third goal will be
the expansion of the range of crisis organizations studied (e.g., hospitals, Civil Defense agencies, departments of public works, Red Cross, Salvation Army, etc.); simultaneously incorporating different types of environmental threat such as natural disaster and other ecological crises. Research of this nature would result in numerous other comparative analyses, building upon earlier work and providing insights for theoretical expansion. In short, we must empirically maximize the middle range implications of the model while being constantly aware of possibilities for increased abstraction.

The more encompassing concern is patterned organizational behavior under conditions of environmental uncertainty. This is not unique to crisis relevant organizations; it is a fact of organizational life. How is uncertainty monitored and defined? What organizational resources are brought to bear in meeting this uncertainty? What are the action consequences of environmental uncertainty, articulated in terms of adaptive organizational activities? If it is assumed (as has been assumed) that organizations attempt to approach rational control over relevant dimensions of their environment, then uncertainty must be confronted through some form of systemic adaptation. This study has offered a language to conceptualize how this process of change unfolds.
FOOTNOTES: Chapter VI

1. It could well be that intelligence and influence are independent dimensions, i.e., decentralized intelligence may be accompanied by centralized influence. This is an empirical question and the proposition, as stated, is highly equivocal. However, it is felt that this dimension warrants both theoretical and empirical attention.


3. Through this method, we would be able to determine the direct causal effect of all model variables upon objective organization change. Thus firm decisions could be made about inclusion of variables in the model. In addition, several other dependent variables are readily specified by the technique. For example, we can isolate intelligence as a dependent variable and determine the direct effect of the threat, size, comparative reference, complexity, wealth, and professionalization variables with no violation of the time assumption.

4. Total variance explained supplies a criterion through which the necessity for introduction of new variables can be determined. It tells us the degree to which the isolated variables have explained change.

5. As of now, a pre-requisite for path analysis is interval level data, although some suggestion has been made for the use of this technique with ordinal data. See Richard P. Boyle, "Path Analysis and Ordinal Data," American Journal of Sociology, 75 (1970): 461-480. However, the ramifications of this suggestion have not been elaborated or debated fully thus far.


10. The author hopes to move in this direction himself.
APPENDIX A
The Disaster Research Center since it was formed has been studying organizational problems in natural disasters. Numerous groups in different communities around the country have helped us in our research on disaster planning. More recently we have turned to studying the responses of organizations to another kind of community emergency -- civil disturbances. Many organizations that participated in our earlier studies of disasters are being contacted regarding their ways of preparing for disturbances.

We have the impression that civil disturbances or the threat of them has led to different kinds of changes or innovations in emergency planning or preparations. But these changes have come about in different ways and for different reasons. This current study is an attempt to learn what problems there are in introducing innovations and what accounts for the changes in emergency planning or preparations for civil disturbances.

We are particularly interested in major emergency organizations such as yours, and how policy decisions were made regarding changes in emergency planning or preparations. For this purpose, we need to talk to the key officials such as yourself in these organizations. Our goal is to get an overall picture of organizational changes and the decisions that brought them about. Through talking with policy makers as well as persons directly involved in training and planning in your organization, we will be able to learn about problems in preparing for civil disturbances.

Eventually, as in our earlier study of natural disasters, we hope to draw up a general picture of organizational problems in civil disturbances, and what emergency plans and preparations can be made. This information will be available to any community organization that requests it. As usual, we will not specifically identify the particular organizations or officials who provide us with the information.

Whatever help you can provide our field staff will be deeply appreciated. The value of our study and its accuracy is obviously totally dependent upon the cooperation of officials such as yourself. We thank you ahead of time for your assistance.

If there are any specific questions about this study or the Center, please call one of us collect at 614-293-5916.

Sincerely,

Russell R. Dynes  
Co-Director  
Disaster Research Center

E. L. Quarantelli  
Co-Director  
Disaster Research Center
SCHEDULE #1 (POLICY)

Name_________________________ Position_________________________

Organization__________________ Date_____________________________

Interviewer____________________ Tape recorded: Yes____ No_______

I. General Questions

1. What problems did the possibility of civil disturbance present to your organization?

2. In viewing these problems, we would like you to rate, generally, how important the solution of these problems was to the department's objectives of emergency prevention and response.

   ______ very important
   ______ moderately important
   ______ of little or no importance

Now, we would like to get some idea of the general emergency features of your organization and determine how long you have had them.

3. Will you please look at this list. For each item, I would like you to indicate three things: whether it is a current feature of the organization, and if there have been any changes in that item since 1965 (when civil disturbances started to occur on a large scale in American cities).

II. Policy Questions.

1. As you may have noticed, we have grouped the specific features into six general categories:

   Planning for response
   Training
   Adding resources
   Establishing specialized subunits
   Developing relationships with other organizations
   Developing relationships with the public

   We want to learn to what extent problems associated with civil disturbances brought about changes in these six general areas.

2. I would like you to rate each of these areas according to whether you feel this involved either an "extensive policy change," a "moderate policy change" or "little policy change." By policy change I mean not only approval from yourself (or whoever may have occupied the position earlier) but those policy changes which required a great deal of your time and effort.
In other words, did these involve major or extensive policy changes, moderate policy changes, or little policy change?

Let's take the first one: planning for response to civil disturbances -- Did changes in planning involve extensive policy changes, moderate policy changes, or little policy change? etc.

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3. We want to discuss ONE of these policy areas in greater detail. In which one of these six areas were policy considerations of greatest importance for meeting the problems posed by civil disturbances?

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4. What changes in policy were made in this area?
   a. What were these changes intended to accomplish?
   b. Why were these important problems for your organization?
   c. How did these policy changes affect these problems?

After determining that policy adjustments were necessary in this area, the organization was, of course, faced with making appropriate changes. Along these lines, we would like to learn who participated in making these policy changes and how this participation was organized.

5. Which existing departments of the organization participated in making these policy changes? (Probe for list of departments.)
   a. What contributions did these departments make?
   b. Who represented these departments?

6. What members of the organization were most influential in the development of these policy changes?
a. What is their position in the organization?

b. Why were they influential? (knowledge, authority position, experience, etc.)

7. Was a particular department of the organization assigned primary responsibility for developing these policy changes?

a. If so, how was this responsibility carried out?

8. Was any standing committee formed to develop or consider policy changes in this area?

a. If so, who composed the committee?

b. What were its activities?

c. How often did it meet?

9. It is possible that time was spent considering possible courses of action. Which of the following most nearly describes what occurred in your organization?

_____ a. A great deal of time was spent considering possible courses of action.

_____ b. A small amount of time was spent considering possible courses of action.

_____ c. Practically no amount of time was spent considering possible courses of action.

10. What other alternatives were seriously considered?

a. Why were these alternatives rejected?

b. Were there any disagreements over the merits of these alternatives?

c. How were these disagreements resolved?

11. Approximately how many man hours were spent considering alternatives, gathering and evaluating information and developing the policy changes we have been discussing?

12. Your department may have been in contact with other (police, fire) agencies from time to time to discuss problems, exchange information, obtain advice about new programs, techniques, etc.

a. What particular departments were you in contact with?
b. What was the nature of this contact?

c. Which of the following most nearly describes the extent of this contact?

- 1. frequent contact with many departments
- 2. frequent contact with a few departments
- 3. relatively infrequent contact with other departments
- 4. little or no contact with other departments

Exchanges of information with other (police departments, fire departments or hospitals as the case may be) may have a bearing on these particular policy changes.

13. Did you make site visits to other (police, fire) departments?

a. How frequently?

b. Who made these visits? (Establish both names and positions)

14. (ONLY IF PLANNING IS BEING DISCUSSED) Did you examine other (police, fire) civil disturbance plans?

15. Did members of your organization attend any conferences or seminars in which these policy changes were discussed?

a. Which ones?

b. Who represented your organization? (Establish both names and positions)

16. Have there been frequent informal exchanges of information between your organization and other (police, fire) departments?

a. If so, how did this informal exchange take place?

b. Who has been involved from your organization? (Establish names and positions)

17. Have any journals or publications been particularly helpful in making policy changes? Which ones?

18. Was someone in the organization assigned the responsibility of looking at journals, magazines or publications that were relevant to these policy changes?
We would like to get your opinion on the overall usefulness of the information we have just been talking about.

19. Was the information you received generally consistent or contradictory?
   a. If contradictory, in what ways?

20. Was there enough information available?
   a. Was there too much information to keep up with?

21. Did the information you received increase the number of possible policy alternatives open to the organization? In what areas?

Relationships with other community organizations may have influenced policy changes. For example, police, fire, hospitals, civil defense, mayor's office, Red Cross, Salvation Army, utilities. (The list provides examples, there may be others.)

22. Were any of these groups or organizations involved with your organization in a joint committee for planning of community response to civil disturbance?
   a. If so, what was the nature of this joint activity?
   b. Which organizations were involved?
   c. Who represented your organization? (Establish both names and positions.)
   d. What influence did this committee have on policy changes?

(ONLY FOR POLICE AND FIRE DEPARTMENTS)

23. Did meetings or contacts with the National Guard influence these policy changes?
   a. What was the nature of these contacts?
   b. Who represented your organization in these contacts? (Establish both names and positions.)

To end up, there are just two more questions:

24. Has your organization received funding from any new source for changes relating to civil disturbances (e.g., LEAA, etc.)?
   a. From what source?
b. for what purpose?

25. In general, have civil disturbances or the threat of them, led to changes in the mission or responsibilities of the organization within this community?

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**A. PLANNING FOR EMERGENCY**

RESPONSE

1. Written civil disturbance plans?  
2. Emergency call-up procedures?  
3. Mass arrest procedures?  
4. Policy on looters?

**B. TRAINING**

1. Riot training for recruits?  
2. In-service riot training?  
3. Community relations training?

**C. RESOURCES**

1. Equipment especially for crowd or riot control?  
2. Emergency operations, command, and communications center?  
3. Mobile command and communications facilities?  
4. Reserve or auxiliary police or manpower?

**D. SPECIALIZED SUBUNITS OF THE DEPARTMENT**

1. Rumor control center?  
2. Community relations unit?  
3. Emergency planning unit?

**E. RELATIONSHIP BETWEEN THE POLICE AND OTHER EMERGENCY ORGANIZATIONS**

1. Written agreements with the National Guard?  
2. Mutual aid agreements with other law enforcement agencies?
3. Written agreement with fire department?
4. Written agreement with utilities?
5. Written agreement with educational institutions?
6. Written agreements with mass media?
7. Written agreements with other city government agencies?
8. Written agreements with Red Cross?
9. Written agreement with Salvation Army?

F. RELATIONS WITH THE PUBLIC AND COMMUNITY GROUPS
1. Special efforts to recruit officers from minority groups?
2. Use of integrated patrol teams?
3. Efforts to concentrate present officers from minority groups in minority neighborhoods?
4. Regular communication with leaders of militant minority groups?
5. Regular communication with leaders of traditional minority groups?
6. Regular communication with other citizen groups?
# FEATURES OF FIRE DEPARTMENTS

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## A. PLANNING FOR EMERGENCY RESPONSE

1. Written civil disturbance plans?
2. Task force operations?
3. Emergency call-up procedures?
4. False alarm procedures for emergency?
5. Armed guards on trucks during emergencies?
6. Use of firemen for riot control?
7. Policy for protection of firemen during extreme situations?

## B. TRAINING

1. Recruits given riot training?
2. In-service riot training?
3. Community relations training?

## C. RESOURCES

1. Protective safety equipment (e.g., vests, covered cabs, safety goggles)?
2. Addition of auxiliary firemen?
3. Riot guns?
4. Emergency operations, command, and communications center?
5. Mobile command and communications facilities?
6. Reserve fire fighting equipment?
7. Emergency water supply?
### D. SPECIALIZED SUBUNITS OF THE DEPARTMENT
1. Community relations unit?
2. Security unit?

### E. RELATIONSHIP BETWEEN THE FIRE DEPARTMENT AND OTHER ORGANIZATIONS
1. Mutual aid pacts with other departments?
2. Written agreements with police departments?
3. Written agreements with National Guard?
4. Written agreements with utilities?
5. Written agreements with Red Cross?
6. Written agreements with Salvation Army?
7. Written agreements with local hospitals?

### F. DEVELOPING RELATIONS WITH THE PUBLIC
1. Special efforts to recruit firemen from minority groups?
2. Department sponsored community service projects?
Our purpose in interviewing you is to obtain some information and understanding on how civil disturbances or the threats of them have affected the (planning) (training) of your organization. We are interested in what problems the possibility of civil disturbances presented and the changes or innovations that were made in (planning) (training).

So we wouldn't take too much time, we have put together some fairly specific questions about changes in (planning) (training). There are about a dozen questions in all. If you have time afterwards, perhaps you could give us some additional thoughts about the matter.

1. What particular problems did civil disturbances or the threat of them present for (planning) (training) in your organization?

2. In viewing these problems, we would like you to rate, generally, how important the solution of these problems was to the (planning) (training) objectives of effective emergency response?
   
   ______ very important
   
   ______ moderately important
   
   ______ of little or no importance

3. What changes in (planning) (training) in your organization have been made?
   
   a. What were these changes intended to accomplish (i.e., what problems were they focused upon)?
   
   b. When were these changes made?

After determining that changes or adjustment in (planning) (training) were necessary, the organization was, of course, faced with making these appropriate changes. Along these lines, we would like to learn who participated in making these changes and how this participation was organized.

4. Was a particular department of the organization assigned the primary responsibility for developing these changes?
   
   a. If so, how was this responsibility assigned?
   
   b. How was this responsibility carried out?
5. Which existing departments of the organization participated in making these changes?
   a. What was the nature of their participation (i.e., what did they contribute)?
   b. Who represented these departments?

6. What members of the organization were most influential in the development of these (planning) (training) changes?
   a. What is their position in the organization?
   b. Why were they influential? (knowledge, authority, experience)

7. Was any standing committee formed to develop or consider these changes?
   a. If so, who composed the committee?
   b. What were its activities?
   c. How often did it meet?

8. It is possible that time was spent considering possible courses of action in (planning) (training). Which of the following most clearly describes what occurred in your organization?
   ____ a. a great deal of time was spent considering possible courses of action.
   ____ b. a small amount of time was spent considering possible courses of action.
   ____ c. practically no amount of time was spent considering possible courses of action.

9. What other alternatives were seriously considered?
   a. Why were these alternatives rejected?
   b. Were there any disagreements over the merits of these alternatives?
   c. How were these disagreements resolved?

10. Approximately how many man hours were spent considering alternatives, gathering and evaluating information and developing the (planning) (training) changes we have been discussing?
11. Your department may have been in contact with other (police, fire) agencies from time to time to discuss problems, exchange information, obtain advice about new programs, techniques, etc.

   a. What particular departments were you in contact with?
   b. What was the nature of the contact?
   c. Which of the following most nearly describes the extent of this contact?

      ______ 1. frequent contact with many departments
      ______ 2. frequent contact with a few departments
      ______ 3. relatively infrequent contact with other departments
      ______ 4. little or no contact with other departments

   Exchanges of information with other (police, fire) organizations may have had an influence on these particular changes in (planning) (training).

12. Did you make site visits to other (police, fire) departments?

   a. How frequently?
   b. Who made these site visits? (Establish name and position.)

13. Did you examine other (police, fire) civil disturbance plans?

14. Did members of your organization attend any conferences or seminars concerning (planning) (training) in the area of civil disturbances?

   a. Which ones? (Establish when and where.)
   b. Who represented your organization? (Establish name and position.)

15. Have there been frequent informal exchanges of information between your organization and other (police, fire) departments?

   a. If so, how has this occurred?
   b. Who has been involved from your organization? (Establish name and position.)

16. Have any journals or publications been particularly helpful in making changes? Which ones?
17. Was someone from your organization assigned the responsibility of looking at publications, journals, magazines, etc., that would include material relevant for (planning) (training)?

We would like to get your opinion about the overall usefulness of the information we have been talking about.

18. Was the information you received generally consistent or contradictory?
   a. If contradictory, in what ways?

19. Was there enough information available?
   a. Was there too much information to keep up with?

20. Did the information you receive increase the number of possible courses of action open to the organization? In what areas?

(TRAINING ONLY)

21. Did any local groups or organizations influence changes in training?
   a. If so, what groups?
   b. What was the nature of the influence?

(PLANNING ONLY)

Relationships with other community organizations may have influenced changes in planning. For example, police, fire, hospitals, civil defense, mayor's office, Red Cross, Salvation Army, utilities. (The list provides examples, there may be others.)

22. Were any of these organizations or groups involved with yours in a joint committee for planning of community response to civil disturbance?
   a. If so, which ones?
   b. What was the nature of the committee's activities?
   c. Who represented your organization? (Establish names and position.)

23. Were any of these organizations individually coordinating their emergency planning with yours?
   a. If so, what was the nature of this coordination?
b. Who from your organization participated? (Establish name and position.)

c. What influence did this have on your planning?

24. Did coordination with the National Guard influence changes in planning?

a. If so, in what way?

b. Who represented your organization in this coordination? (Establish name and position.)

There are just a couple of more questions to finish up.

25. Has your organization received funding from new sources for emergency (planning) (training)? (e.g., LEAA, etc.)

a. If so, from what sources?

b. For what purposes?

26. Besides those we have already discussed, have there been any other individuals, groups, or organizations which have influenced changes in (planning) (training) for civil disturbances?

a. If so, who?

b. What was the nature of this influence?

27. In general, have civil disturbances or the threat of them led to a change in the mission of (planning) (training) within your organization?

a. If so, in what ways?

The last question I would like to ask is:

28. As you view the problem of civil disturbance, what still needs to be done in the area of (planning) (training)?

a. How can these things be done?

b. Why have they not been done up to now?
You have been mentioned to us as someone who has been in contact with other organizations or groups for the purpose of getting information which might assist your organization in problems associated with civil disturbances.

We have talked to others in your organization about their part in developing or deciding upon changes in policy, planning, training, and so forth.

Now we want to talk to someone such as yourself, who gathered information which could be used for training, planning, operations, community relations, policy and things like that.

First, we want to find out how sources of information were located. Then we want to see how the information was obtained and things like that. Finally, we will want to know something of the uses to which the information was put within your organization.

Let's start out with the general question:

1. What sorts of information gathering have you done for your organization? (e.g., attending seminars, conferences, site visits, etc.)

2. Where did you do these things?
   a. When?

3. How did it happen that you were the one in this organization to do these things?

4. In general, what sorts of things did you learn?
   a. Was what you learned new information for your organization?

5. In general, was there enough information available or was there too much to keep up with?
   a. In this respect, did the situation change over time?

6. Overall, was the information you received consistent or contradictory?
7. How great do you feel the overall value of this information was?
   a. Were any of your sources of information of particular value?

8. Once you got this information, what was done with it within your organization?
   a. To whom did you communicate it? (Establish name and position)
   b. Was it communicated in the form of information as you received it or in the form of specific recommendations or alternatives for changes in your organization?
   c. If specific, along what lines?

9. How were your communications received?
   a. Were there any parts of your organization that seemed most favorable to your communications?
   b. Were there any parts of your organization that seemed less favorable to your communications?

10. What ultimate effects, as far as you know, did the information which you got have on the practices of your organization?
    a. If little or none, why not?
    b. If great, why?

11. Do you know if what you learned had any specific effect on specific:
    a. Policies for handling civil disturbances?
    b. Planning for civil disturbances?
    c. Training for civil disturbances?
    d. Community relations activities of your organization?
    e. Operations in civil disturbances?

To finish up:

12. Would you recommend that other similar organizations have people do the same things you did in gathering information?
    a. Why or why not?
We have been studying changes in policy, planning and training within your organization that have been instituted as a result of the possibility of civil disturbances. Many of these changes have to be actually carried out or implemented at the operational level of your organization.

In order to see how such changes are actually carried out, there are a few things we would like to know.

First, let's start with planning.

1. What effect, if any, have changes in planning for civil disturbances had upon emergency operations?
   a. How have these changes in planning been carried out in actual practice?
   b. Have any problems arisen in carrying them out?
   c. If so, how have they been resolved?
   d. What is your evaluation of these changes in planning? (Good points and shortcomings.)
   e. Did people at the operational level play any part or role in the development of the planning changes?

2. What effect, if any, have changes in training for civil disturbances had upon emergency operations?
   a. How have these changes in training been carried out in actual practice?
   b. Have any problems arisen in carrying them out?
   c. If so, how have they been resolved?
   d. What is your evaluation of these changes in training? (Good points and shortcomings.)
   e. Did people at the operational level play any part or role in the development of the training changes?
3. What effect, if any, have changes in policy regarding civil disturbances had upon emergency operations?
   a. What key policy changes have been instituted?
   b. How have these changes in policy been carried out in actual practice?
   c. Have any problems arisen in carrying them out?
   d. If so, how have they been resolved?
   e. What is your evaluation of these changes in policy? (Good points and shortcomings.)
   f. Did people at the operational level play any part or role in the development of the policy changes?

4. Has your work been at all affected by the community relations program of your organization?
   a. If so, in what way?

To finish up, let me ask a general question.

5. Generally speaking, what major problems do civil disturbances present for operations in your organization?
   a. How well have the changes we have been talking about solved those problems?
   b. Which of these problems are still unresolved?
The Disaster Research Center has been studying for a number of years the planning and responses of emergency organizations to such community crises as natural disasters. In the last few years, we have turned our attention also to the problem of civil disturbances.

Some of our research deals with the actual operational responses of emergency organizations involved in a civil disturbance.

However, the purpose of this study is to get information on the long-range adjustments or changes in your organization in response to civil disturbances or their possibility. Thus, in police (fire) departments, for example, we are talking to those officials involved in planning, training, and policy to see what changes have been made in response to civil disturbances.

We also feel that police (fire) relations with the community have become more prominent as a result of civil disturbances. Therefore, we wish to talk with you about what has happened over the last few years in your community relations program.

First, we want to find out how this community relations program came into existence.

1. When was this community relations program established?

2. What were the conditions in the community which led to the decision to start a community relations program?
   a. (IF ANSWER IS GENERAL) Were there any particular events that led to the establishment of the program?
   b. How was it thought that the CR program would affect the conditions or events you mentioned?

3. When this CR program was first established, what was its mission in the department supposed to be?

   We would like to learn something of how the decision to establish a community relations program was reached within your department.

4. Where did the idea for a CR program come from?
a. Did the initiative come from within or outside the department?

b. At the time the idea was being considered, what parts of the department seemed to be most in favor of the program?

c. Were there any particular parts of the department which resisted, opposed, or were unfavorable to the idea?

d. What was the basis of the objections?

e. Did these objections affect the initial program in any way? (e.g., size, budget, activities, date of starting, etc.)

Now we would like to know something of the influences other groups and organizations may have had on the initial decision to start this community relations program. (For example, some may have provided you with important information, expert advice, or some kind of resource which was taken into account in the decision.)

5. Were there any such groups?

a. How did they affect the decision to start a CR program?

b. How did they affect how the CR program was first set up?

c. Who in your organization was in contact with these groups? (Establish name and position.)

d. What was the nature of these contacts (i.e., how often were there meetings, and over how long a period of time)?

It is also possible that there may have been other groups or organizations which affected the initial decision to start the CR program, through some sort of pressure on the department.

6. Were there any such groups?

a. Which ones were most important?

b. How did they affect the decision to start a CR program?

c. How did they affect how the CR program was first set up?

d. Who in your organization was in contact with these groups? (Establish name and position.)

e. What was the nature of these contacts (i.e., how often were there meetings, and over how long a period of time)?
We now want to turn to the initial structure and activities of the community relations program.

7. When the CR program was started, what were its major activities and programs?

8. How many people were in the program?
   a. How many full time?
   b. What were their ranks?

9. Where did the CR program fit into the table of organization of the department?
   a. Who did it report to and things like that?

Now in this last part we would like to look at the changes in the CR program since the possibility of civil disturbances, that is, since about 1965.

10. Has there been a change in the goals or mission of the CR program since 1965?
    a. If so, what is the difference between the new mission and the old?

11. Has there been any change in the types of problems which the CR program is trying to deal with?
    a. What changes?
    b. Did the CR program see the problems in a different way than before?

12. Have there been any changes in the methods or ways which the CR program uses to attack these problems?
    a. What were they?
    b. How were these methods or ways different?

13. Has the CR program grown larger in the number of men assigned to it?
    a. How much larger is it since 1965?
    b. When did this growth in size start?
    c. Has the budget of the program also increased?
d. How much has it increased?

e. When was it increased?

f. Where did these additional funds come from?

14. Have there been any other changes in the CR program other than those we have already discussed?

a. Have there been any changes in the way the program fits into the department's table of organization?

b. When did these changes occur?

c. Why did they occur?

15. Are any of these changes we have been discussing the result of changes in the department's overall policy regarding community relations?

Let's look now at the factors that influenced the changes you have mentioned.

16. Were there any events or conditions in your community which led to a decision to change the CR program?

a. What were they?

b. If they were specific events, when did they occur?

17. Were there any groups or organizations that may have affected the changes made in the CR program? (For example, some may have provided you with important information, expert advice, or some kind of resource which was taken into account in the decision to make a change.)

a. How did they affect the decision to change the CR program?

b. How did they affect how the CR program was changed?

c. Who in your organization was in contact with these groups? (Establish name and position.)

d. What was the nature of these contacts (i.e., how often were there meetings, and over how long a period of time)?

It is also possible that there may have been other groups or organizations which affected the decision to change the CR program, through some sort of pressure.

18. Were there any such groups?
a. Which ones were most important?

b. How did they affect the decision to change the CR program?

c. How did they affect how the CR program was changed?

d. Who in your organization was in contact with these groups? (Establish name and position.)

e. What was the nature of these contacts (i.e., how often were there meetings, and over how long a period of time)?

19. At the times these changes were considered and adopted, how were they viewed within your department?

a. Within the community relations staff?

20. At the time the changes were being considered, were there any reservations, objections, or opposition to them?

a. In which parts of the department?

b. What was the nature of the objections?

c. How did these objections affect the changes that were made in the CR program?

21. Were there any parts of the department that were particularly in favor of the changes being proposed?

To finish up:

22. Are there any things about changes in the CR program that we have not covered and that would enable us to understand better what has been going on?

23. Is there anything you feel should be done by a CR program, which is not being done by your program?

a. What?

b. Why are they not being done by your program?
1. Number of uniformed personnel

2. Number of clerical personnel

3. Number of officers above the rank of patrolman

4. Number of separate bureaus in the department (list)

5. Number of ranks in the chain of command
   a. Number of personnel in each rank

6. Base salary for patrolman

7. Length of training period for recruit patrolmen

8. Number of hours of in-service training per month

9. Number of officers having college training

10. Number of officers from minority groups (1964-1969)

11. Annual operating budget of the department (1969)

12. Per cent of total annual budget allocated for emergency planning (1969)

13. Per cent of total annual budget allocated for emergency equipment (1969)

14. Listing of grants at state and federal levels for law enforcement (e.g., LEAA) 1964-1969
DOCUMENTARY INFORMATION: FIRE

1. Number of uniformed personnel ______
2. Number of clerical personnel ______
3. Number of officers above the rank of firemen ______
4. Number of battalions in the department ______
5. Number of stations in the department ______
6. Number of separate bureaus in the department ______(list)
7. Number of ranks in the chain of command ______
   a. Number of officers in each rank ______
8. Base salary for firemen ______
9. Length of training period for recruit firemen ______
10. Number of hours of in-service training per month ______
11. Number of officers from minority groups ______ (1964-1969)
12. Annual operating budget of the department ______ (1969)
13. Per cent of total annual budget allocated for emergency planning ______ (1969)
14. Per cent of total annual budget allocated for emergency equipment ______ (1969)
15. Listing of grants at state and federal levels for fire fighting ______ (1964-1969)
APPENDIX D
INTERVIEW ANALYSIS FORM

Name of Organization ________________________________________

Name and Position _________________________________________

Schedule ________________________________________________

1. Defined civil disturbance related problems. (List)

2. Rating question -- Solution of problems ______________________

3. Rating question -- Extent of policy changes
   A. ______________________________ D. _____________________
   B. ______________________________ E. _____________________
   C. ______________________________ F. _____________________

4. Specific changes made in the discussed area. (Designate area and summarize)

5. Listing of subunits and representative subunits involved in changes. (Summarize description of involvement)

6. Listing and position of influential persons in the development of changes. (Summarize the nature of their influence)

7. Rating question -- Alternatives of action considered _____________

8. Discussion of alternatives.

9. Number of man-hours spent in developing changes ___________________

10. Listing of contacts with comparative reference or network linkages. (Summarize contact)
11. Rating question -- Extent of contact

12. Listing of site visits. (Description and designation of boundary personnel)

13. Listing of conferences or seminars attended. (Description and designation of boundary personnel)

14. Listing of plans examined. (Who did the analysis)

15. Other sources of intelligence. (Other publications, informal inputs, etc., designation of boundary personnel)

16. Discussion of feedback from experience. (Listing of personnel)

17. Information evaluation. (Liaison instrument for further boundary personnel)

18. Listing and description of other interorganizational contacts.

19. Content analysis of community relations interviews
   a. Changes since 1965
   
   b. Sources of intelligence (boundary personnel)
   
   c. Who and how were changes developed (listing with positions; description of development)
20. Operations instruments (content analysis)

a. Participation in various change areas (planning, policy, training, etc.)

b. Who specifically was involved (listing and positions)
DATA ANALYSIS FORM

Variables

1. Environmental Threat to Charter
   a. Number of civil disturbance events 1965-69 __________
   b. Total number of arrests __________
   c. Total number of deaths __________
   d. Total number of injuries __________
   e. Number of injuries to police and fire personnel __________
   f. Number of deaths to police and fire personnel __________
   g. Total property damage __________
   h. Percent minority group in the community __________
   i. Rating, Problems question __________ Average __________

Comments:
A. List of problems discussed in interviews (number)

B. Impact from experience

2. Organizational Intelligence
   a. Number of site visits __________
   b. Number of conferences attended __________
   c. Number of training seminars __________
   d. Number of plans examined __________
   e. Number of publications __________
   f. Formalized feedback from experience __________ yes __________ no

Describe:
g. Formalized feedback from outside intelligence ___yes ___no
   Describe:

h. Other intelligence sources (list)

i. Boundary personnel (list by source of intelligence)

j. Intelligence evaluation (describe)

3. Organization Change
   a. Number of items on checklist ________
      Comments:

   b. Plan
      1. Number of pages _________
      2. When plan established _________
      3. Number of revisions _________
      Comments:
      4. Number of interorganizational relationships in plan ________
      5. Provisions for alternative operational procedures
         ________yes ________no
         Describe:

      6. Provision for updating plan ________yes ________no
         Describe:
7. Provision for training ______yes ______no
   Describe:

8. General comments on plan:

c. Number of hours of emergency or community relations training
   1. Recruit __________
      Describe:

   2. In-service __________
      Describe:

d. Percent spent on emergency planning __________

e. Percent spent on emergency equipment __________

f. Size of community relations staff __________

g. Number of community relations programs __________

   Comments:

h. List of relevant grants

4. Comparative reference
   a. Number of departments in contact __________

   b. Rating question, extent of contact ______ Average ______

   c. Nature of contacts (describe, e.g., informal versus formal)
d. Number of departments on mailing list

5. Normative reference
   a. Community (list)

   b. State (list)

   c. Federal (list)

6. Alternatives of action
   a. Number of alternatives considered

   b. Rating question, alternatives of action considered
      Average

   c. Comments:

7. Complexity of change
   a. Number of subunits involved

   b. Total number of persons involved

   c. Number of manhours expended

   d. Number of meetings

   e. Standing committees
      yes  no
      Describe:

   f. Comments:
8. **Incumbent influence**
   a. **List of influential members**
   
   b. **Basis of influence**
   
   c. **Description of influential activity**
THE EXPANDED MODEL

Basic Propositions

1. The greater the objective environmental threat to organizational charter, the greater the organizational intelligence.
2. The greater the perceived environmental threat to organizational charter, the greater the organizational intelligence.
3. The greater the comparative reference linkage, the greater the organizational intelligence.
4. The greater the organizational size, the greater the organizational intelligence.
5. The greater the organizational wealth, the greater the organizational intelligence.
6. The greater the organizational professionalization, the greater the organizational intelligence.
7. The greater the organizational complexity, the greater the organizational intelligence.
8. The greater the organizational intelligence, the greater the organizational change.
9. The greater the organizational intelligence, the broader the range of problem solving.
10. The greater the organizational intelligence, the more complex the process of organizational change.
11. The greater the organizational intelligence, the less centralized the process of organizational change.
Derived Propositions

12. The greater the objective environmental threat to organizational charter, the greater the perceived environmental threat to organizational charter.

13. The greater the objective environmental threat to organizational charter, the greater the comparative reference linkage.

14. The greater the organizational size, the greater the objective environmental threat to organizational charter.

15. The greater the organizational wealth, the greater the objective environmental threat to organizational charter.

16. The greater the organizational professionalization, the greater the objective environmental threat to organizational charter.

17. The greater the organizational complexity, the greater the objective environmental threat to organizational charter.

18. The greater the objective environmental threat to organizational charter, the greater the organizational change.

19. The greater the objective environmental threat to organizational charter, the broader the range of problem solving.

20. The greater the objective environmental threat to organizational charter, the more complex the process of organizational change.

21. The greater the objective environmental threat to organizational charter, the less centralized the process of organizational change.

22. The greater the perceived environmental threat to organizational charter, the greater the comparative reference linkage.

23. The greater the organizational size, the greater the perceived environmental threat to organizational charter.
24. The greater the organizational wealth, the greater the perceived environmental threat to organizational charter.

25. The greater the organizational professionalization, the greater the perceived environmental threat to organizational charter.

26. The greater the organizational complexity, the greater the perceived environmental threat to organizational charter.

27. The greater the perceived environmental threat to organizational charter, the greater the organizational change.

28. The greater the perceived environmental threat to organizational charter, the broader the range of problem solving.

29. The greater the perceived environmental threat to organizational charter, the more complex the process of organizational change.

30. The greater the perceived environmental threat to organizational charter, the less centralized the process of change.

31. The greater the organizational size, the greater the comparative reference linkage.

32. The greater the organizational wealth, the greater the comparative reference linkage.

33. The greater the organizational professionalization, the greater the comparative reference linkage.

34. The greater the organizational complexity, the greater the comparative reference linkage.

35. The greater the comparative reference linkage, the greater the organizational change.

36. The greater the comparative reference linkage, the broader the range of problem solving.
37. The greater the comparative reference linkage, the more complex the process of organizational change.

38. The greater the comparative reference linkage, the less centralized the process of organizational change.

39. The greater the organizational size, the greater the organizational wealth.

40. The greater the organizational size, the greater the organizational professionalization.

41. The greater the organizational size, the greater the organizational complexity.

42. The greater the organizational size, the greater the organizational change.

43. The greater the organizational size, the broader the range of problem solving.

44. The greater the organizational size, the more complex the process of organizational change.

45. The greater the organizational size, the less centralized the process of organizational change.

46. The greater the organizational wealth, the greater the organizational professionalization.

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48. The greater the organizational wealth, the greater the organizational change.

49. The greater the organizational wealth, the broader the range of problem solving.
50. The greater the organizational wealth, the more complex the process of organizational change.

51. The greater the organizational wealth, the less centralized the process of organizational change.

52. The greater the organizational professionalization, the greater the organizational complexity.

53. The greater the organizational professionalization, the greater the organizational change.

54. The greater the organizational professionalization, the broader the range of problem solving.

55. The greater the organizational professionalization, the more complex the process of organizational change.

56. The greater the organizational professionalization, the less centralized the process of organizational change.

57. The greater the organizational complexity, the greater the organizational change.

58. The greater the organizational complexity, the broader the range of problem solving.

59. The greater the organizational complexity, the more complex the process of organizational change.

60. The greater the organizational complexity, the less centralized the process of change.

61. The broader the range of problem solving, the greater the organizational change.

62. The more complex the process of organizational change, the greater the organizational change.
63. The less centralized the process of organizational change, the greater the organizational change.

64. The broader the range of problem solving, the more complex the process of organizational change.

65. The broader the range of problem solving, the less centralized the process of organizational change.

66. The more complex the process of organizational change, the less centralized the process of organizational change.
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215


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