Introduction

In this paper we outline a sociological approach to the study of organizational stress. Following a brief review of the relevant literature a conceptual framework is introduced and discussed at some length. Illustrations which point to the utility of the various concepts are drawn from the field and laboratory work of the Disaster Research Center. Finally, some basic theoretical and methodological problems are discussed with possible solutions suggested.

Organizational Stress Literature

In the attempt to develop a useful theoretical framework for both field and laboratory research on organizations under stress we reviewed a large body of "stress" literature and related studies of crises and disaster. A brief summary of portions of this literature will be presented to provide background for the theoretical statement which follows.

It became clear that there was little consensus on the meaning of the concept "stress." Two kinds of distinctions appeared necessary. First, we were interested in system stress, whatever that might be, and not individual stress. However, most of the literature dealt with personal or psychological stress.[1] Secondly, it was clear that "stress" as used in the literature referred to at least three relatively distinct phenomena:

1) stimuli or "stressors,"

2) a state or condition of a system, and

3) response or adaptation.

These distinctions are illustrated in the summary that follows:

A. Research on "extreme stiuations"

Some authors have preferred to avoid the term stress and instead have focused on what they label extreme situations. Wallace viewed disaster as part of this larger category which he defined as follows:

> Situations involving the threat of, or experience of, an interruption of normally effective procedures for reducing certain tensions, together with a drastic increase in tensions, to the point of causing death or major personal and social readjustment, may be called "extreme situations."[2]

Bettleheim analyzed reactions of prisoners in Nazi concentration camps and attempted to describe certain characteristics of "extreme situations."[3] He expands on this perspective in his more recent work.[4]

At one point Torrance explicitly rejected the use of the term stress because of its many and confusing connotations and used instead the phrase "behavior in emergencies and extreme conditions."[5] Later, however, he used the term and suggested that, " . . . the distinctive element in group stress is lack of structure or loss of anchor in reality experienced as a result of the stressful conditions."[6] Thus, while food deprivation, extreme cold or prolonged isolation might be elements which partially characterize an "extreme situation," Torrance placed major emphasis on the loss of structure. This has its parallel in Bettleheim's description of deprivation which produces inability to predict outcomes of day to day events. We found this to be a central idea in related literature, for example, in the study of crises.

B. Crisis research

Crisis, like the term stress, has been defined in a variety of ways. The early work of W. I. Thomas has been influential[7] and many of his formulations remain current.[8] Thomas defined a crisis as ". . . simply a disturbance of habit . . . ."[9] He emphasized that crises precipitate change in societies and that specialized occupations are developed by societies to deal with crises, e.g., medicine men, priests, and judges.

Interest in "crises" is found in many substantive areas. For example, Straus has reported on recent experiments in which families were subjected to a simulated crisis which was created through modification of procedures first developed by Swanson and later modified by Hamblin.[10] Each family was directed to figure out the rules of a game and their scores were compared to those of a hypothetical "average family." After four periods of play those families selected as "crisis" families ". . . receive penalty lights, and fail to keep up with the scores of the 'average family.' This is defined as a crisis because the previously successful mode of play suddenly becomes ineffective and the family fails to achieve its goals using these patterns."[11]

The concept of "crisis" with implications for mental health was explored by Miller and Iscoe[12] who concluded that the following criteria indicate when an emotional crisis is present: (1) the time factor (acute rather than chronic), (2) marked changes in behavior (less effective, attempts to discharge tensions), (3) subjective aspects (feelings of helplessness and ineffectiveness in the face of what appear to

be insoluble problems), (4) relativistic aspects (what constitutes a crisis to one individual or group does not constitute it for another group), and (5) organismic tension (experienced in a variety of ways, may be temporary or long term).[13]

A series of studies in decision-making under crisis conditions were completed at Northwestern University. Efforts were made to identify basic characteristics of a crisis. Robinson concluded that "A situation of the greatest severity (the most crisis-like) would be one in which the occasion for decision arose from without the decisional unit, required a prompt decision, and involved very high stakes."[14]

While working on the same project, Hermann suggested that an organizational crisis could be conceptualized along three dimensions. "An organizational crisis (1) threatens high priority values of the organization, (2) presents a restricted amount of time in which a response can be made, and (3) is unexpected or unanticipated by the organization."[15] It is important to note that Hermann utilized the concept of "crisis stimulus" and referred to the organization as responding to such a stimulus. However, "'Crisis stimulus' and 'crisis response' or reaction will be used to separate aspects of the same concept."[16]

Form and Nosow used the concept of crisis to conceptualize individual, group, and organizational behavior following a community disaster.[17] Note how the concepts of disaster and crisis are related, i.e., the disaster creates a crisis.

> The concept 'disaster' is generally applied to the condition of a community at a particular point in time. From the point of view of its residents, the disaster creates crisis. Crisis may be considered as a breakdown of the social relations and social systems in a community that are of greatest significance to the individual or particular organization involved. In another sense, crisis may be thought of as a destruction of the stable relationships that are necessary for the person. Crisis emerges when these relationships are perceived as being destroyed or in process of destruction.[18]

In summary, two important ideas should be noted. A crisis situation is defined as one where previous modes of behavior are applicable no longer. Secondly, crisis might be conceptualized as a continuous rather than a discrete variable such that the intensity of the crisis might be measured by several indicators, e.g., priority of values threatened, amount of available response time, and so on.

C. Disaster research

Natural disasters have long been a topic of interest of social scientists. While responses to numerous disasters have been "analyzed," most reports have been descriptive and journalistic rather than theoretically oriented.[19]

Recently Barton reviewed several classic disaster studies and attempted to develop a theoretical model.[20] He conceptualized disaster as part of a larger category--collective stress, which was defined ". . . as a large unfavorable change in the inputs of some social system."[21] By inputs he referred to the physical environment, external economic relationships, external power relationships, and sources of personnel. Barton was able to weave previous disaster studies into this input-output

model where social systems were viewed not as existing in a vacuum, but rather in a dynamic, ever-changing environment. A disaster may result in changes in the input variables which in turn may cause change in the social system.

From a different perspective, Bates and his associates analyzed portions of their data from the response to Hurricane Audrey in terms of various types of "role stresses."[22] The hurricane was conceived as an external "cause" which created various types of stress, e.g., loss of a family member, neighbor, or friend, loss of property, disruption of businesses and occupations and the general disruption of the community social organization. The impact of these events on individuals were analyzed in terms of "role stresses" of which four types were formulated: (1) role conflict--conflict between the roles an individual plays; (2) role frustration--playing of normal roles may not be possible for some time after the disaster; (3) role inadequacy--inability of the individual to play the role he is expected to play because of personal inadequacy; and (4) role saturation--overloading the individual with role expectations or of not expecting enough of him.[23]

Of major importance, however, is the idea that disasters may be viewed as external events which precipitate a variety of environmental changes within which individuals, groups, and organizations function. As they attempt to cope with the changed environment we might refer to them as being under stress.

D. Research on complex organizations

Many sociologists have used the concept of stress in the "natural system" organizational model.[24] With this model, organizations are viewed as complex systems which strive for survival through continuous adaptation. Merton, for example, suggested that "strain" might serve as the key concept to avoid static functional analysis.

> The key concept bridging the gap between statics and dynamics in functional theory is that of strain, tension, contradiction, or discrepancy between the component elements of social and cultural structure. Such strains may be dysfunctional for the social system in its then existing form; they may also be instrumental in leading to changes in that system. In any case, they exert pressure for change. When social mechanisms for controlling them are operating effectively, these strains are kept within such bounds as to limit change of the social structure.[25]

Similarly, Parsons utilized the concept of strain to inject a dynamic quality into social system analysis. He defined strain as ". . . a condition in the relation between two or more structured units (i.e., subsystems of the system) that constitutes a tendency or pressure toward changing that relation to one incompatible with the equilibrium of the relevant part of the system."[26] In his discussion of structural change, the concept of strain is crucial. Hence, "Structural change is possible only when a certain level of strain on institutionalized structure is reached."[27]

In his paper, "A Theory of Role Strain,"[28] Goode re-echoed the view that structural inconsistencies exist in society. He made an initial effort to list the types or sources of role strain, i.e., difficulty in meeting given role demands. He suggested that since

individuals cannot fully satisfy all demands, they must move through a continuous sequence of role decisions and bargins by which they attempt to adjust the demands. Society imposes limits on behavior as well as providing certain mechanisms for the reduction of strain. The degree of societal integration, determined by the amount and type of strains, is thus reflected by the sum of role decisions made by actors as they endeavor to reduce strain.

This idea is very similar to Guest's interpretation of the changes in "plant Y" which was "acutely ill" and became "extremely healthy" over a three year period.[29] Guest concluded that the organization became better "integrated," i.e., that consensus increased on role expectations held by various position incumbents. Lack of such consensus ". . . determines the degree of tension and stress likely to be found in the organization."[30] Similarly, Stogdill defined "group integration" ". . . as the extent to which structure and operations are capable of being maintained under stress."[31]

Using the terms somewhat differently, Bertrand suggested a similar analysis. He defined stress as". . . a force exerted between contiguous portions of a structural whole. Strain is conceived as relating to the degree with which a given actor is able to manage his tensions."[32] Thus, "conceptually strain may be distinguished as a functional (or dysfunctional) process, whereas stress is a structural element."[33] He illustrated the distinction with the following example. ". . . in a given factory system, stress will be inherent in the fact that the inept boss' son is selected to fill an important executive

position. Strain associated with this stress will be manifest in the behavior of those persons who must put up with this 'actor,' even though his ineptness is a source of frustration for them."[34]

Previous simulation research emphasized an additional basic notion. During the early 1950's Kennedy, Chapman, Biel, and Newell conducted four experiments in the Air Defense Direction Center.[35] Teams of airmen worked together to "defend" an area of roughly 100,000 square miles by tracking all simulated air traffic. As the number of tracks increased and saturation of the group seemed imminent, the experimenters observed changes in group performance. These changes led Kennedy and Chapman to conclude, "These empirical results seem to indicate that an organization will look for new patterns of behavior when it needs them--when it is under stress."[36]

More detailed analysis revealed that as the total number of tracks increased, the total team effort increased only slightly. However, there was severe reduction in attention to lower priority tracks as the airmen increasingly discriminated between threatening and non-threatening flights. As task inputs were altered, they modified their model of organization.[37] Thus, the organization changed under stress, i.e., when there was an increase in demands on the system.

Stress and strain are concepts which are used in the complex organizations literature. Precise definitions usually are not offered, indeed, there appears to be little consensus as to whether they are interchangable terms. However, the literature suggests clearly that structural inconsistency or strain is a necessary variable in under-

standing organizational change. Also, the degree of integration or lack of strain appears to be a key variable in predicting the amount of stress a social unit might tolerate. Finally, there is some evidence that as the demands on an organization increase new modes of response will develop; there will be structural change.

A Conceptual Framework for the Analysis of Organizational Stress in Disaster

Firsthand observation by Disaster Research Center field teams in 40 disasters over a three and a half year period indicates rather clearly that the organizations and groups which participate in disaster related activities following a community disaster are not of a single type. At the one extreme are organizations such as the police which routinely handle "emergencies" varying in scope and severity and at the other are emergent units such as new co-ordinating bodies and rescue teams. We have identified four relatively discrete types of such organized units: Established, Expanding, Extending, and Emerging units. The conceptual framework to be presented here applies at a very general level to the first three types but in only a limited fashion to the fourth, the emerging groups. It was developed primarily in reference to what we call established organizations and seems to have its greatest utility in conducting research on them.

An organization is a relatively permanent and relatively complex discernible interaction system.[38] This definition emphasizes three major elements. First, the organization is conceived of as an interaction system and hence has the characteristics commonly associated with a social system,

e.g., interdependence of parts and some type of boundary. This interaction system is relatively complex, both horizontally and vertically. It is relatively permanent in that it exists over a period of time.

When organizational incumbents are observed over a prolonged period of time, certain patterns or similarities in activity and interaction sequence can be noted.[39] These various interaction patterns, among members, as well as between incumbents and non-members, are summarized under the heading performance structure of the organization. There are, of course, many types of patterned interaction but we have chosen to focus initially on those dealing with (1) organizational tasks, (2) decision-making, (3) enactment of authority and influence, and (4) communication.

As sociologists often point out, much of the patterning which occurs in human interaction flows from a framework of social norms. The patterned interaction and activity of an organization is produced in large measure by a host of social norms which come from the general culture as well as from within the organizational system itself. The normative structure of an organization is composed of social norms which specify required and permissible interaction and activity. Social norms are ideas about how classes or categories of persons ought to act and interact in specified situations. They are not descriptions of behavior but specifications for behavior. Norms are clustered into roles and positions; thus, any position incumbent is expected to (should) behave in accordance with an entire set of norms which specify the reciprocal behaviors which are to occur between a person in his position and those in a series of other positions.[40] Since norms are both official and unofficial in origin and source of sanctioning

we make a conceptual distinction between the official normative structure and the unofficial normative structure. The stability of patterned interaction over time, even where member turnover is considerable, suggests that the normative structure has a persistence that goes beyond the participation of any particular combination of persons as members.

The interpersonal structure consists of relatively stable sets of person-to-person orientations and understandings that develop over time among the specific organizational members. In contrast to norms which are categorical in nature, these understandings emerge as persons respond to each other as unique individuals. Note, however, that we are not referring to individual characteristics as such, but rather to types of relationships which emerge and exist between particular organizational members, independent of the positions they enact.

The internal and external resources of an organization also have a shaping and constraining influence on the patterned interaction and activity which can be observed. The ecological distribution of offices and equipment is but one example. Such resources are of three general types: 1) equipment, materials and buildings, 2) information and records, and 3) personnel.[41] This notion includes physical objects, their location in space and perhaps most significantly sets of ideas about their appropriate and potential utilization. Also included would be the skills and organizational "know-how" of the members of the organization. To illustrate: following an earthquake an organization legally responsible for co-ordinating the efforts of at least a dozen other organizations was housed in a building with grossly inadequate space, especially for a staff swollen to many times its normal size. Clearly

these internal resources shaped and constrained the actions and patterned interaction which occurred. But just as obviously the performance structure was affected by external resources. The telephone system for the entire city had become almost totally inoperative but several nearby organizations had mobile radio units which could be utilized immediately and partial communication was quickly restored with those organizations whose efforts were to be co-ordinated.

But organizations are not static systems. Following a disaster the dynamic quality is more readily observed. It should be noted that on any given "typical" day organizational incumbents engage in a large number of patterned actions which, when viewed collectively, constitute the performance structure of the organization. It is also clear that in addition to the current performance structure, an organization could be engaged in a variety of other actions. That is, given its normative structure, interpersonal structure, and resources, it is capable of carrying out what is already being done, and many other things as well. Thus, organizational capability is defined as the range of possible organizational actions which an organization could perform if appropriate decisions to do so were made.

Organizational demands may emanate from a variety of sources. They may come from individual citizens; another organization such as city or state governmental units; or any other organization with which the focal organization has a relationship. Often demands are self-imposed by organizational members who, after receiving cues from the environment, proceed to act without waiting for a specific request from a non-member. The normative structure of an organization will usually include a series of "if-then"

specifications. For example, "if" a certain external change occurs (e.g., a tornado which has probably knocked down power lines), "then" a certain set of prescribed actions should take place. The broad concept, organizational demands, may thus be thought of as requests or commands for organizational action which are either received directly by some member of the organization or resulting from knowledge of demand-relevant cues. A distinction is made between "potential demands" and "legitimate demands" the latter being those which are defined by organizational incumbents as falling within the areas of responsibility of the organization.

Demands on an organization may vary somewhat from day to day and in some organizations vary considerably from season to season. Such variation may be both quantitative and/or qualitative. For example, when the state fair is in session the police may have to cope with a sharp increase in traffic congestion. A highway department may be faced with a qualitative change when a freak snowstorm hits an area which seldom has significant snowfall.

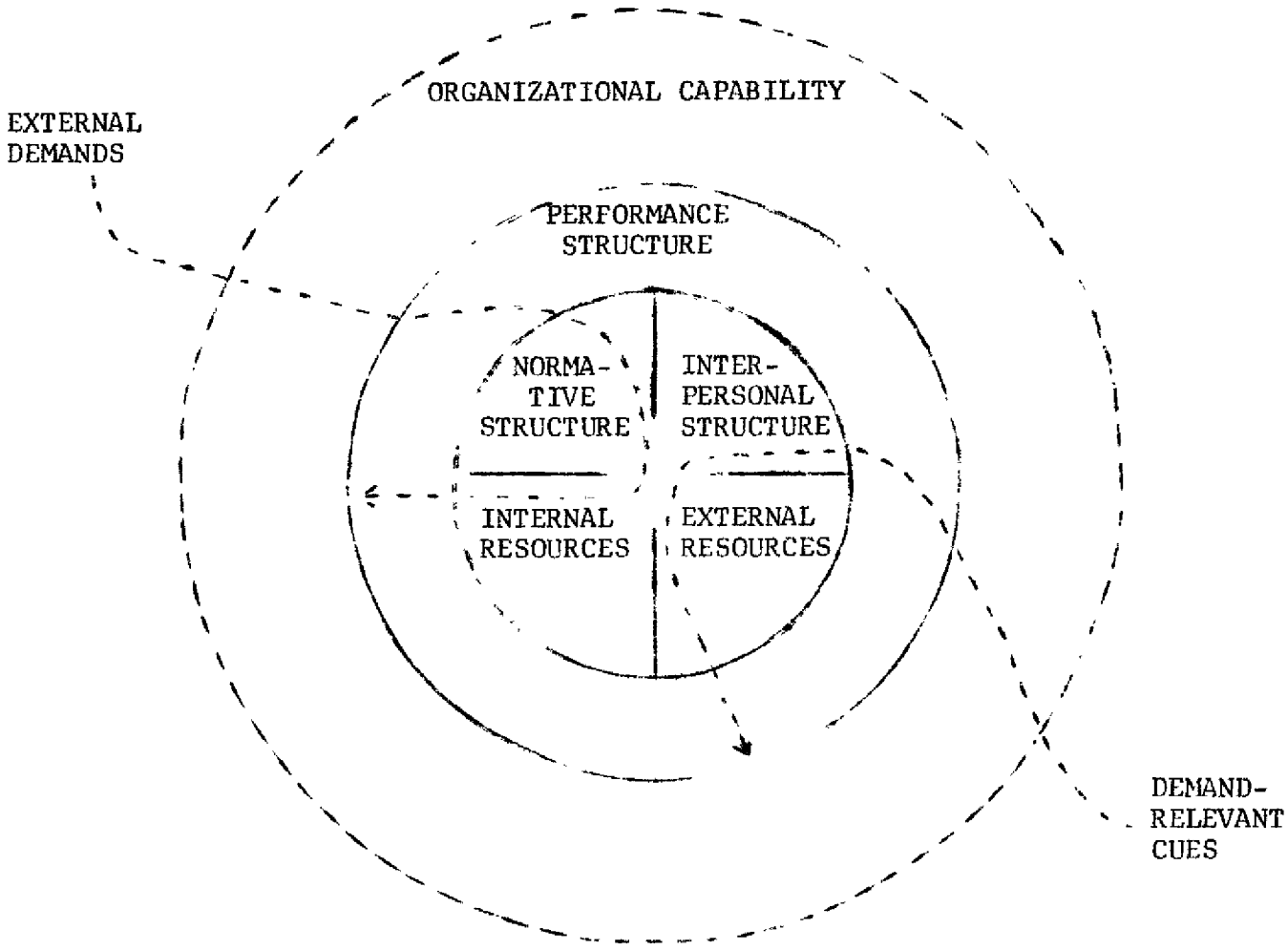
In addition to quantitative or qualitative fluctuations in demands, variations as to priorities may also occur. Certain demands, if not fulfilled, have more serious consequences, i.e., some are more important than others, for either the welfare of the organization or the total community. High priority values of the organization are threatened by some demands. Hence, a decision required by the Mayor's office to order, or not to order, evacuation of a city in light of an approaching hurricane may be the most important decision the Mayor might make while in his term of office. Closely related to the degree of seriousness attached to the demand is the

variable of time, i.e., how much time is available before organizational action is required. These two variables, considered jointly, determine the priority of the demand. Thus, organizational demands may vary along three separate axes: quantity of demands, actual qualitative changes in demands, and priorities attached to demands.

The interrelations among the variables discussed so far are crucial. Let us summarize briefly the framework thus far presented. An organization is a complex interaction system. Empirical referents which can be directly observed are the patterned interaction sequences which collectively make up the performance structure. As is illustrated in Figure 1, several concepts are used to explain why performance structures assume particular patterns. Much observed behavior of groups can be understood by the normative structure when such concepts as positions, roles, official and unofficial normative structures are used. However, certain activity will appear that will remain unexplainable unless analysts are aware of interpersonal relationships, idiosyncratic to the position incumbents. Considered jointly, these two concepts explain much interaction. However, five groups may have very similar normative and interpersonal structures, but exhibit different interaction patterns largely because of the physical design of work areas. Thus, such internal resources as ecological placement of desks or offices must be taken into account. Finally, differences in organizational behavior may result because of variation in external resources. These four concepts, viewed as highly inter-related, can account for all patterned interaction at any given point in time. It should be clear that the concepts are empirically overlapping, i.e., interaction is guided by all four factors simultaneously. Conceptually,

FIGURE 1

INTERRELATIONSHIPS OF BASIC CONCEPTS[a]



[a] The paths of the arrows through the four elements are drawn for illustrative purposes only; no theoretical route is intended to be implied other than to point out that all of the four elements play a part in determining the effect of a demand on the performance structure.

however, they are four distinct analytical tools.

These four elements are also related to the concepts of organizational demands and capability. The normative structure, which suggests how and when internal and external resources ought to be utilized, appears to occupy a central position in limiting organizational capability. Organizational demands are viewed as constantly entering an organization at a variety of points. Certain demand-relevant cues from outside the organization may also enter the system through the performance structure. However, response to such cues, as well as specific external demands, cannot be anticipated except through an awareness of the four basic elements, as the very acceptance or rejection of potential demands is determined by a composite of the four elements. Thus, a demand may enter an organization through an incumbent who may evaluate it not to be a legitimate concern of the organization on the basis of the normative structure, i.e., the demand is not something the organization ought to fulfill. Such demands may be returned to the sender or just ignored.

Usually demands enter organizations at normatively prescribed entry points and are processed through similarly prescribed channels. It is obvious, however, that demands are not processed only on the basis of the normative structure, as frequently a demand will be rerouted so as to arrive at a position incumbent not prescribed by the normative structure. Such an incumbent may have been selected because of his perceived competence for dealing with this particular demand or because the sender just happened to like or dislike him. At any rate, the demand did not follow the channel prescribed by the normative structure, and explanations for such deviations may be found in the