

THE ORGANIZATION OF DISASTER RESPONSE
CORE CONCEPTS AND PROCESSES*

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A theory of the structure and process of organization is being developed from archival data which describe the activities of established and emergent groups and organizations following disasters. The theory points to four necessary and sufficient elements of organization--domain, tasks, human and material resources, and activities--while making no assumption about their patterning in time and space. It is argued that 24 logically possible patterns of initiating, maintaining, and suspending organization reflect an underlying continuum of Weberian formal rationality to more elemental forms of collective behavior. Documented patterns for 423 instances of organization from 15 events, the disaster demands to which they were directed, and the focal organizations who performed them are presented. Implications of the evolving theory for disaster research and general sociology are discussed.

Introduction

The following is one of 423 instances of organization that I refer to

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in this paper. It is not atypical, but it does illustrate what I will characterize as deviation from Weberian formal rationality, in this case by an emergent group.

A warning issuance group is set up immediately prior to major flooding and continues to operate until flood waters recede. The response develops as follows: A state coordinator of natural resources is part of the executive office of the governor and has only a small staff of his own (not relevant to the response). However, an office of state engineers and several other state units are responsible to the governor through the state coordinator of natural resources. The routine function of the office of state engineers is to administer water diversion programs for the state. Some 40 regional administrators (state engineers) are in the field during the pre-flood period. Several call the state water commission looking for something to do. Hearing of the impending flooding and the availability of the state engineers, the state coordinator of natural resources suggests that the engineers begin gauging water and monitoring flows on all major streams in their areas. He also informs them that he will set up an ad hoc headquarters at the state highway patrol office at the capital city and that they should provide him real time assessment data on a continuing basis. It is not clear how many state engineers are involved in warning issuance activities, but a majority are said to be. The state coordinator then asks the highway patrol to disseminate this warning information to state and local enforcement agencies through its state-wide network. The highway patrol complies with this request. It is not clear when in the chain of events the highway patrol agrees to this arrangement, but it appears certain that the governor's disaster coordination unit, the state office of civil defense, is not aware of and does not endorse this action until the response is well underway. Later, some state and local officials question both the validity of the warning information provided by this ad hoc group and whether it should have been doing this kind of thing in the first place.

I judge the process of organization in this instance to be human and material resources initiated (R), followed by the development of a task structure (T), the performance of activities relevant to that task structure (A), and, finally, the establishment of a domain (D) which legitimized the response.

What is organization? Is it a thing or a process? In either case, what is rational about organization? What are the types of organization? What distinguishes organization from other types of social action? These questions have long perplexed students of disasters from all of the social and management sciences. We are not alone in our bewilderment because they are fundamental to all fields represented in the specialty. Speaking as a sociologist, I think it is a good idea for disaster studies and general sociology to be linked closely rather than isolated. Simply put, I work toward the development of knowledge about human organization generally by studying social

responses to disasters and emergencies. The data being used are the archives of the Disaster Research Center at the Ohio State University which cover a large number of disasters, only some of which are referenced in my current work.

The major premise of this paper, and the ongoing study from which it comes, is that sociological theories of organization remain an important need of disaster research and sociology. By sociological theory I mean one that is directed to defining and explaining organization in terms of its structural rather than individual properties (Mayhew, 1980 and 1981). Working from the specialty of disaster research, I am developing a formal theory of organization and disaster that first, can be applied usefully to disaster preparedness and mitigation programs (Dynes, Quarantelli and Kreps, 1972; Burton, Kates and White, 1978); second, informs a more adequate understanding of disaster as physical and social event (Fritz, 1961; Barton, 1969; Dynes, 1970); and third, makes a contribution to what loosely has been referred to as "structuralism" in sociology (Hawley, 1950; Hannan and Freeman, 1977; Lincoln, 1979; Fuguitt and Kasarda, 1981; Blau and Merton, 1981; and many others).

I assume that instances of organization are observable things (Warriner, 1956 and 1970); that these things are boundary spanning yet open systems of action (Bertalanffy, 1968; Dubin, 1978); and that they are important instances of the structure of human populations. Structure is represented by aggregate, distributional, and emergent (relational) properties of social positions, activities, and units (Mayhew, 1980; Aldrich, 1979; Blau, 1977; Barton, 1961). I also assume that material and nonmaterial (subjective) properties of structure are analytically separable. I will suggest below that collective representations have material content (Coenen, 1981) and can be interpreted usefully as emergent structural properties. This interpretation of structure therefore draws heavily from Simmel and Durkheim. Equally important, I see organization as structure and process and think that both must be taken into account by any structuralist theory. I emphasize process also because it is central to the phenomena I study.

I will refer to focal organizations (Evan, 1966) who engage in disaster relevant activities. Indeed, organizations such as public bureaucracies, voluntary agencies, firms, and emergent groups have been the units of analysis in most organizational studies of disasters (Mileti, Drabek and Haas, 1975; Mileti, 1980). This same tendency characterizes the complex organizations literature generally, where the existence of organization is simply assumed (Hall, 1982; Perrow, 1979). But the unit of analysis is **not** the focal organization in the present study and, even though measurable features of focal organizations (e.g., size, complexity) are theoretically relevant, "organization" itself is not defined in terms of them. In keeping with the emphasis on process, the **organized response** is the unit of analysis and the major data production problem is to distinguish those human

responses to disasters which reflect "organization" from those that do not. This strategy is not one simply of personal preference. It is necessary because the existence of organization cannot be assumed unquestionably in the disaster context, and its supposed absence is defined repeatedly (by many disaster researchers and hazards managers) as a problem. So, in the disaster context (and I suspect many others) "organization" is best defined not as an entity but as **a process of initiating, maintaining, and suspending instances of disaster relevant structure of human populations.** So defined, organization is a "summative" analytical unit (Dubin, 1978); one (like system) that globally represents but does not specify the elements and processes of the thing called organization.

In the sections that follow I will define the elements and processes of organization; discuss my methodological approach to documenting them from the archives and present some preliminary findings; and, finally, note some possible implications for disaster research and sociology.

The Elements and Processes of Organization

The process of organization has four fundamental elements: (1) domain, (2) tasks, (3) human and material resources, and (4) activities. I assume that these elements capture the essence of organization but they are logically and empirically independent. Thus, the four elements are individually necessary and collectively sufficient for organization to exist and, as is argued and empirically supported below, no single pattern in their relationship can be assumed. In Dubin's (1978) terms, the elements are "enumerative" analytical units of organization because their presence characterizes any organized disaster response, regardless of their particular patterning in time and space. Drawing from Durkheim's classic notion of social facts (Durkheim, 1938; Lukes, 1972; Ritzer and Bell, 1981), domain and tasks will be interpreted as collective representations of organized activities. While I do not deny that these collective representations have intra- and intersubjective meanings (Hedberg, 1981; Weick, 1981), I focus only on their material content in the form of information about social actions (communications, organizational vocabularies, formal mandates, laws).¹ Human and material resources and activities are the remaining material properties of organization.

I For some time I have been intrigued by the notion of "bounded rationality" and its variant, the so-called "garbage can" model of organization (Cohen, March and Olsen, 1972; March and Olsen, 1976). The idea of bounded rationality has guided much research on hazard mitigation (Kunreuther, 1978; Burton, Kates and White, 1978; Mileti, 1980) as well as some recent work on warning response (Perry, Lindell

Domain

Domain is a collective representation of a community (broader system) function of an organized response (Wenger, 1978). Domains are recognized by direct participants **and** relevant others (individuals, groups, organizations), and evidenced by formal and informal communications. By collective representation I mean generalized (external to given individuals) information which indicates what is taking place and facilitates time and energy use in the performance of organized activities. As system property, domain therefore has normative import, specifying both internal and external legitimations (via the content of information) of what a response will and will not do (Thompson, 1967; Haas and Drabek, 1973). A processual view of domain is centrally important. It suggests that in some cases the domain of response may be clearly evidenced before the event, while in others it is an emergent social construction of the emergency period.

Tasks

Tasks are collective representations of how a domain is accomplished. Although tasks for a given domain may range from few to many--and this is an important property of the complexity of organization (Perrow, 1967; 1979)--the logical independence of tasks from domain is essential to the notion that organization is a boundary spanning yet open system. As defined above, domain very clearly presents open system dynamics for its existence is predicated upon both internal and external communications. Tasks, however, evidence more clearly the boundary spanning or closed system information used in the structuring of human and material resources and activities (Thompson, 1967). Recognizing the independence of tasks and domains is essential to a process model of organization as well. Thus tasks may be present following or prior to domains; and, in either case, they may be pre-established or emerge as the crisis develops. Even where domains and tasks are replanned, the emergent

and Green, 1981). In both cases the focus is on individual decision-making. In the end, the bounded rationality approach is somewhat limited for structuralist theory because it is intentionally reductionistic. In a very real sense organization is no more or less a container than the garbage can metaphor. A sociological conception of organization (i.e., the can) seldom gets articulated. Interestingly, March and Simon (1958) originally implied that what is uniquely sociological about decision-making is represented by "organizational vocabularies" (goals, rules, and procedures articulated in formal and informal communications). These vocabularies have material content and are to some extent anonymous to all participants (Perrow, 1979). From Simon and March to March and Olsen, much of the discussion or organizational vocabularies is unwittingly but strikingly similar to Durkheim's notion of collective representations.

character of both is documented by the often reported inability to anticipate all the demands generated by disasters (Stallings, 1970; Brouillette and Quarantelli, 1971; Haas and Drabek, 1973).

Human and Material Resources

People and their many capabilities, commodities, and equipment are, in effect, the "raw materials" of any organized disaster response. Human and material resources may be controlled internally by the response--further describing the system boundary of organization--or accessible through facilitating relationships. In either case, they represent disaster relevant capabilities that ultimately conjoin with the other elements. Any response becomes tenuous when resources are lacking or inadequate and the relevance of these resources is socially determined. They may be mobilized before or after impact, and they can be present prior to or following domains and tasks in the process of organization.

Activities

Activities are the interdependent actions of individuals, groups, and organizations which articulate the raw materials of organization (human and material resources) with collective representations (domains and tasks) of what is happening. The logical independence of activities from the remaining elements is critical to a process view of organization. Obviously people perform activities, suggesting that activities and resources are not completely irreducible. However, the performance of activities can clearly precede or follow not only domains and tasks, but the major mobilization of response related human and material resources. Responses initiated by activities reflect perhaps the most elemental form of organization--what is often referred to as collective behavior (Barton, 1969; Weller, 1969; Dynes, 1970; Weller and Quarantelli, 1973; Gillespie and Perry, 1976).

The Patterns of Relationships Among The Elements of Organization

As stated earlier, I argue that this set of four elements is necessary and sufficient for organization but that no single pattern in their relationship can be assumed. A Weberian interpretation of formal rationality (Kalberg, 1980) suggests the dominance of domain patterns, with perhaps the following being the most typical:

Domain Tasks Human and Material Resources Activities

Here there is the "rational" development of domain (perhaps established by law or formal charter) leading to the creation of tasks (perhaps specified by planning), which then results in the identification and mobilization of relevant human and material resources and, finally, the performance of activities more or less consistent with domain and task definitions (and implied judgments about effectiveness). Such a pattern depicts quite well some of the actions some of

the time--e.g., hospitals engaged in medical care--but it is grossly deficient for characterizing a great deal of organized social action. For example, organized debris clearance may begin with the chance location of equipment and personnel. Organized search and rescue groups may emerge from the parallel activities of individuals. An organization with well-defined task definitions may take on actions that are not legitimated (domain consensus) until after the actions are started. Even organizations like police departments, who have predefined domains and tasks in disasters, engage in a variety of demonstrably nonroutine activities during the emergency period.

Although not usually expressed in terms of these concepts, past research supports the idea that each element may be critical at a given time for initiation, maintenance, or suspension of the others and therefore determine the process of organization. Given four elements, the number of possible patterns is large but limited by logic. Table 1 illustrates possible patterns of initiation in terms of a basic factorial design. In Dubin's (1978) terms, the patterns reflect

Table 1: Patterns of Initiation of Organized Disaster Response

Domain Dominates Initiation	Human and Material Resources Dominate Initiation
1. D T R A ^a	1. R A D T
2. D T A R	2. R A T D
3. D R A T	3. R D T A
4. D R T A	4. R D A T
5. D A T R	5. R T D A
6. D A R T	6. R T A D

Tasks Dominate Initiation	Activities Dominate Initiation
1. T R A D	1. A D T R
2. T R D A	2. A D R T
3. T A D R	3. A T D R
4. T A R D	4. A T R D
5. T D R A	5. A R D T
6. T D A R	6. A R T D

^a D = Domain

T = Tasks

R = Human and Material Resources

A = Activities

the system state of initiating organization. In Simmelian terms, the patterns suggest one typology of the "forms of association," with a pointed separation of form from content in addressing organization. My approach is to document pattern types from the archives and, in so doing, address the question of what organization is and therefore what is to be explained by sociological theory.

Note that maintenance and suspension are also system states and the same 24 possibilities attend to restructuring and termination of organization. The key notion of a system state (Dublin, 1978) is that the system as a whole (organization) has some distinctive feature (initiation, maintenance, suspension) which is specified by measurable values of its analytical units (unit outcomes of the four elements). Initiation and suspension are characterized by **attribute** values (presence-absence) and temporal ordering of the four elements. Organization is initiated (system state ended) when the last element is in place. Therefore, the transition from initiation to maintenance is one of logical necessity, regardless of how long initiation takes. Organization is terminated when any element is absent; however, the loss of the remaining three elements remains important because of the possibility of a recurrence of organization. The system state of maintenance is characterized by **variable** values of the elements (presence in degree). The process of restructuring is as follows: An element related contingency arises (e.g., a piece of equipment is damaged). If resolved, the response continues until the need is met or some new contingency appears. If not resolved, the relevant element sets off the process of suspension. Such oscillations are critical for understanding the process of organization. Although pattern types are fixed logically, it is important to note that both initiation and suspension involve only one iteration among the elements (onset or termination), while maintenance may involve many. Thus traditional functionalist notions of reciprocal causation or feedback among the elements seems germane only to the maintenance state (Stinchcome, 1968).

In brief, I seek a structuralist-systems theory that is oriented to the material properties of process and structure. By organization (system) I mean an assemblage of defined parts (the four elements) whose interactions in time and space (the patterns of relationships among the four elements) make it possible to characterize the system as a whole. By implication, the "whole is more than the sum of its parts" because the parts in isolation tell us very little about the system. But if we know the **total** of parts and the relationships among them, then the actions of the system are derived from the actions of the parts (von Bertalanffy, 1968; Dubin, 1978). Once having defined what organization is in more precise fashion, we begin to get a better feel for what is social but not organization. Most social networks of individuals, groups, and organizations do not meet the defining criteria of organization. This in no way diminishes their importance

for documenting interdependencies of human populations (White et al., 1978; Aldrich, 1979; Drabek et al., 1981; Leik et al., 1981). Moreover, it is at least arguable that the presence of any 1-3 elements is necessary and sufficient for other forms of association defined (summatively) as social networks. Although not the focus of the present paper, logically possible social network patterns suggest an additional 40 forms of association, for a total of 64 patterns among the elements of organization.

Note that I am not trying to accommodate an "action theory" with "systems theory," and stay only at the structural level. Yet, I do not think it follows that the approach is sociologically reductionist (DiTomaso, 1982) for at least a couple of reasons. First, the fact that activities are logically independent in process from the remaining three elements indicates that not all social phenomena are a part of organization. The relevance of social networks is apropos of the same point, even though I clearly do not think that the social network, willy nilly, is the more fundamental social reality. Such a stance finesses rather than confronts the concept of organization. Second, I do not assume that the internalization of domains and tasks is the explanation for their structural effects on individuals. I agree with Wrong and others that a more reasonable assumption is that simple habit formation occurs when collective representations are pre-established and that trial and error learning takes place when they are emergent (Wrong, 1961; Weick, 1981; DiTomaso, 1982). Stated another way, I can comfortably assume "voluntaristic" individual decision-making (Parsons, 1951) because the limits of structural effects are highlighted by the patterns of relationships among the elements of organization and the fluidity of disaster situations. However, I question whether individual choice dynamics are central to a sociological theory of organization. Quite the contrary, I feel our preoccupation with them may be counterproductive.

System theorists argue that no system can be understood without taking the environment into account. I certainly agree. The social environment of organization consists of more or less encompassing systems. Keeping with the wholes-parts distinction outlined above, the relationships among systems are defined by the interaction of their analytical units, in this case the four elements of organization. In the disaster context, organized responses are systemically linked by domain legitimation, by the exchange of human and material resources, and by the interdependence of tasks and activities. The process perspective taken also points to the link between a systems perspective and nonteleological functionalism. The concept of domain, in particular, relates any response to some community function which is tied to the demands of disasters. But the patterns of initiation suggest that social purpose may follow as well as precede social action. In effect, whether functions are manifest or latent (Merton, 1957; Campbell, 1982) depends on the temporal patterning of collective representations in the process of organization. Finally,

it is suggested that there is an important analytical distinction between purposes and consequences of social action. One important consequence is the persistence of organization in terms of its impact on disaster demands and control over events related to its broader social network.

Methodological Strategy and Preliminary Findings

The developing theory and findings reported here are based on studies by the Disaster Research Center (DRC of the Ohio State University) of social action in local communities during the emergency period of selected natural disasters. The resulting several thousands of transcribed interviews and documents are located in DRC's well-maintained archives. The initial DRC studies (1963-70) are particularly relevant for my purposes because data were collected on a wide range of activities in an effort to document what happened during the emergency period. Generally stated, data production requirements of the theory are (1) to document empirical patterns of initiation, maintenance, and suspension of organized disaster response (the unit of analysis) and (2) to measure other variables of the response, event, and community to help interpret organizational patterns.

Sampling of Events, Interviews and Organized Responses

Table 2 lists the purposive samples of events, interviews (transcribed), and organized responses that I have produced thus far. I have also reviewed hundreds of documents related to these events such as after-action reports, meeting minutes, reports from direct observations by DRC staff, and newspaper accounts of event. But the primary foundation of theory building was the interviews with participants. My criteria for selecting events from the archives were (1) that they could yield interpretable data on organized responses; (2) that data production would continue until an N of 300-400 organized responses was achieved; and (3) a sufficient number of events would be studied so that event and community differences could be explored. I stopped data production with samples of 15 events, 1062 interviews, and 423 responses. Simply put, the data are **not** useful for testing anything and that is not my intent. Rather the archives are reasonably well-suited for theory building--in this instance for revealing what active organizations are doing, the processes related to organized action, and the various contexts in which action takes place (Kreps, 1981).

The limits of the data gathering effort are considerable. I clearly do not know what the population parameters of organized responses are for the events studied, and for some events I have data on but a few responses. Some of the events were studied with greater intensity than others by DRC, and the interviews and documents vary widely

in depth and quality. None of the data were collected with the theory in mind. Thus, in working with the interviews one never knows where

Table 2: Samples of Events, Interviews, and Organized Responses

Events	Number of Interviews	Number of Responses
1. Alaska Earthquake 1964	250	92
2. Hurricane Betsy (New Orleans) 1965	128	36
3. St. Paul, Minn. Floods 1965	50	6
4. Minneapolis, Minn. Tornadoes 1965	30	7
5. Central South Colorado Floods 1965	58	33
6. Mankato, Minn. Flood 1965	22	4
7. Topeka, Kansas Tornado 1966	143	64
8. Belmond, Iowa Tornado 1966	13	7
9. Jackson, Miss. Tornado 1966	50	8
10. Fairbanks, Alaska Flood 1967	98	56
11. Oak Lawn Chicago, Ill. Tornado 1967	59	18
12. Jonesboro, Ark. Tornado 1968	35	22
13. Hurricane Camille, Gulf Coast 1969	70	36
14. Minot, North Dakota Flood 1969	37	16
15. Fargo, North Dakota Flood 1969	19	18
Totals	1062	423
1 earthquake	250	92
2 hurricanes	198	72
6 tornadoes	330	126
6 floods	284	133

or even if useful information can be found. Large numbers of interviews go on for 50-100 pages and many others are longer than that. With the chronic difficulties of studying process and with the immense problems of studying disasters in the first place (Drabek, 1970), the possibilities of measurement error are numerous and major. As implied by the case description which began this paper, I have tried to increase face validity by recording descriptions of each response.

Measurement of Organized Disaster Responses, Disaster Demands, and Focal Organizations

The core measurement problem of the study was to document the patterns of organization (Table 1) and, in so doing, identify both the disaster demands to which they were directed (i.e., types of domains) and the focal organizations who performed them. Table 3 classifies organized responses by disaster demands and Table 4 arrays the distribution of responses in terms of the focal organizations who performed them. The majority of responses were directed to emergency demands and this was expected, given the focus of the original data collection effort. Such demands are compelling and those focal organizations performing them can be identified. Note the percentages of responses on Table 4 (50.8 percent) by emergency relevant public bureaucracies (e.g., police, fire, hospitals, departments of public works). Such organizations were well-studied by the Center and they should have been. At the same time, Table 4 shows that data are available on a variety of other established and emergent groups.

It must be recognized that many disaster demands are "up for grabs" and quite often more than one organization is doing the same thing.² That is to say, boundary specification is an important methodological concern in disaster research because several focal organizations can have the same domain and there is often considerable overlap of response patterns. Focal organizations were identified in three ways in this study: First, and primarily, participants usually named their responses or associated them with established organizations. Second, there were noticeable breaks in the control of human and material resources. Third, there were points of discontinuity in the interdependence of activities.

² Note also that a given focal organization may have been simultaneously or sequentially engaged in more than one organized response. It was represented as such in the sample of 423 responses. For example, the 148 responses from the Alaska earthquake and Fairbanks flood were engaged in by 108 focal organizations. Thus, documenting instances of organization is critically tied to the identification of demands (functions), which then translate as domains of organization. It cannot be gainsaid that important taxonomy problems

My research strategy involved a "mini-case study" approach in which I (1) identified the organized responses from the archives, the demands to which they were directed, and the focal organizations who performed them; (2) recorded qualitative descriptions of what took place; and (3) selected the logically possible pattern which most closely approximated the described instances of organization. It became evident very early--indeed my frustrations with the archives over the years had anticipated it--that I could only judge patterns of initiation with any confidence for most of the events studied by DRC. In effect, I made observer judgments about the "forms" of initiating organization that were based on descriptions of the "content" of what happened. I was therefore oriented to validity through case description.³

The distributions on Table 5 provide some very interesting information with which to work. Twenty of the 24 logical possibilities are

attend to the identification of disaster demands. In effect, I developed a classification of generic functions by time phases. These time phases allow for the isolation of disaster demands in a kind of life history approach to the description (and possible comparison) of disaster events. I recognize that neither time phases nor demands have precise boundaries. On the other hand, it must be remembered that domains are analytically treated in the theory (and communicated by participants as well) as generic. It was therefore appropriate to develop a generic list such as that presented in Table 3. Yet I remain sensitive to and plagued by the fact that a definitive taxonomy of disaster demands has yet to be invented. Problems of classifying focal organizations are less difficult and less important if one assumes (as I do) that the pivotal need is to develop a complete enumeration of more abstract forms of association.

³ I have not addressed reliability of "form" judgments except in the following fashion. I first judged the patterns of initiation for about 75 responses from three events by selecting 100+ interviews. I filed these judgments and started over. After going over all of the interviews and documents from the three events, and writing up the case descriptions, I then compared my first and second judgments. Consistency of judgments was about 60 per cent, suggesting considerable measurement error, with most of the errors relating to misidentification of domain initiation patterns as something else. However, the initial judgment were usually based on one interview while the majority of responses were described in several. I believe that I became more accurate as I retrieved more information. That is, the second judgments were more valid than the first and therefore more reliable. Sensitized by this experience, the bias that I have been most concerned about is misidentification of DTRA, in particular, because of its relationship to traditional conceptions of formal rationality. The result, I suspect, is that measurement error is slanted conservatively toward over-representing DTRA.

documented at least once. Even though the interviews (and original studies) were slanted toward the actions of disaster relevant public bureaucracies, note that only 39 per cent of the responses are DTRA. The DRTA (12.5 per cent) and DRAT (6.6 per cent) point to the improvised nature of task performance, even where domain is established first. The RDTA (15.6 per cent) and other resources initiated patterns document Thompson and Hawkes' (1962) assertion that the coexistence of need and available resources can initiate organization,

Table 3: Type of Disaster Demand of Organized Response

Disaster Demand (Function)	Frequency	Percent
Hazard-vulnerability analysis	3	.7
Standby human and material resources	6	1.4
Disaster prep., planning, training	11	2.6
Public education	0	0.0
Hazard mitigation-structural	0	0.0
Hazard mitigation-nonstructural	0	0.0
Insurance	0	0.0
Issuance of predictions and warnings	11	2.6
Dissemination of predictions and warnings	15	3.5
Evacuation	24	5.7
Protective action	17	4.0
Mobilization of personnel and resources	70	16.5
Search and rescue	29	6.9
Medical care	24	5.7
Care of fatalities	5	1.2
Providing basic needs	50	11.8
Damage and needs assesment	14	3.3
Damage control	33	7.8
Restoration of essential services	21	5.0
Public information	20	4.7
Traffic control	31	7.3
Law enforcement	3	.7
Local govenance	1	.2
Coordination and control	21	5.0
Reconstruction of physical structures	6	1.4
Reestablishment of economic functioning	2	.5
Resumption of other social institutions	2	.5
Determining liability for the event	0	0.0
Reconstruction planning	5	1.2
Totals	423	100.0

here in the absence of a legitimated domain. They also illustrate Thompson's (1967) and Perrow's (1967) arguments that administrative and technical rationality are not the same thing. All of the non-DTRA patterns, as a group (61 per cent), highlight the inherent flexibility of social organization. Finally, domain initiated patterns of all types, while obviously important, do not overwhelm the others nor does it appear that they necessarily should. Disaster stricken communities face problems in which rapid and extensive departures from many of their social routines are required. Such changes assure that the range of patterns of organized activity are substantial. And one cannot assume that domain initiated patterns are more rational or effective.

I suggest that there is an underlying **continuum of routine to non-routine structuring and restructuring processes in the interrelationships among the elements of organization** (Kreps, 1978; Perrow, 1967; Stinchcombe, 1968; Gerwin, 1981). The routine end is represented by DTRA, depicting the "ideal type" bureaucracy coined by Weber. A non-routine process is specified in varying degrees by patterns that are different from DTRA. In all cases, attention focuses on the direction of the causal flow between collective representations of action (domains and tasks) and other material properties of the response (human and material resources and activities). The non-routine end of the continuum is represented by the ARTD process as the most elemental pattern of collective behavior. Here discrete but parallel activities of individuals, groups, and organizations become interdependent. This is followed by the mobilization of collective resources directed to these activities. Tasks and domains of action emerge from rather than antecede activities. Though also an "ideal

Table 4: Type of Focal Organization of Organized Response

Focal Organization Type	Frequency	Percent
Emergency relevant public bureaucracy	215	50.8
Other public bureaucracy	22	5.2
Emergency relevant voluntary agency	40	9.5
Special interest group	27	6.4
Private firm	9	2.1
Emergent group of individuals	28	6.6
Emergent group of other groups and organizations	24	5.7
Military unit	37	8.7
Mass media	21	5.0
Totals	211	100.0

type," there is no reason to assume that ARTD is any less rational than DTRA. In effect, the theory suggests the basis for a taxonomy which might provide common ground for organizational and collective behavior perspectives.

It should also be recognized that to be routine at initiation does not necessarily predict routineness at maintenance or suspension. I would also suggest that the specification of the continuum itself varies by system state. Thus routine patterns of maintenance are arguably activities related (e.g., activity performance or resource contingencies); while nonroutine patterns are domain related (e.g., confusion about domains or tasks). Similarly, routine patterns of suspending organization are activities related (i.e., as the demand is met

Table 5: Pattern of Initiation of Organized Response

Pattern of Initiation	Frequency	Percent
D T R A	165	39.0
D T A R	6	1.4
D R A T	28	6.6
D R T A	53	12.5
D A T R	2	.5
D A R T	1	.2
T R A D	22	5.2
T R D A	4	.9
T A D R	0	0.0
T A R D	0	0.0
T D R A	1	.2
T D A R	0	0.0
R A D T	16	3.8
R A T D	11	2.6
R D T A	66	15.6
R D A T	12	2.8
R T D A	6	1.4
R T A D	12	2.8
A D T R	2	.5
A D R T	0	0.0
A T D R	2	.5
A T R D	4	.9
A R D T	6	1.4
A R T D	4	.9
Totals	423	100.0

activities decrease until some threshold of suspension takes over); while nonroutine suspension is domain related (i.e., there is absorption of the domain, tasks, and perhaps resources and activities by another entity). In point of fact, the distributions on Table 5 grossly under-represent activities dominated processes of structuring, re-structuring, and terminating organizations.

Measurement of Other Properties of the Response, Event, and Community

The research deals only with patterns of initiation directly, but the archives also provide some information on the maintenance and suspension of organized responses. Table 6, for example, suggests that once initiated, a response tends to persist until the demand is met (57.9 per cent). Although only a minority of responses were suspended because of a loss of one of the defining elements (17.5 per cent), the unresolved question is what happened to those that had not been terminated at the time of the interviews.

I am collecting data also on several other variables that I hope will help interpret response patterns. First, I am recording any descriptions of domain, tasks, resources, and activities contingencies faced by the response. Second, I am attempting to measure both the complexity of organization and the social network relevant to it. Third, I am able to estimate crudely disaster preparedness of focal organizations and disaster experience of the community as a whole. Fourth, the 15 events listed in Table 2 can be compared, at the very least, in terms of magnitude of impact, scope of impact, and length of forewarning. Finally, some data are available on contextual properties of the surrounding communities. The resulting data base is a combination of qualitative descriptions and machine readable data, the latter coded at the nominal and ordinal level.

Table 6: Reason for Suspension of Organized Responses

Reason for Suspension	Frequency	Percent
Demand met, activities terminated	245	57.9
Loss or depletion of human and material resources	17	4.0
Absorption of domain and tasks by another entity	57	13.5
Not suspended at time of interviews	93	22.0
Uncertain	11	2.6
Totals	423	100.0

Projected Work

Both content analysis and the use of a variety of statistical techniques are being undertaken. I have presented simple distributions for but a few key variables in this paper because of space limitations. The next step is to model the organization of disaster response in terms of disaster event, focal organization, and community characteristics (Kreps, 1983). This will be followed by the development of a formal (deductive) theory of organization and social network that hopefully can be applied to a variety of social contexts where questions about organization (or the lack of it) are important. A thorough treatment of the implications of the model and theory for developing emergency management principles will culminate the first phase of the research. In all cases the effort will be to ground ideas with data.

Implications for Disaster Research and General Sociology

Two highly respected disaster researchers noted recently that "in the main, there have been no startling theoretical breakthroughs in the empirical studies, even in the accelerated research in the last decade or so, indicating that not enough necessary spadework has been done" (Quarantelli and Dynes, 1977:42). My research is directed to the need for spadework and basic theory. In addressing that need, I do not rely on individual conceptions of bounded rationality (the Simon-March tradition in the management sciences), valuable though they are for studies of decision-making. Rather, I draw heavily from the structural insights of Simmel and Durkheim and I recast Weber's notion of formal rationality to capture nonroutine social action. I am intrigued by the possibility of a structuralist-systems perspective which defines and explains the process of organization on its own terms.

Implications for Disaster Research

Although disaster research is quite appropriately an interdisciplinary field, the evolving theory suggests a possible framework for more detailed studies of the specific response functions listed on Table 3. There is much to learn about all of them regardless of whether they evoke notions of societal adjustment to hazards or organized responses to disaster events. Frankly, I do not think we have been reflective enough about the key questions and therefore we do not agree about what is to be studied. Hopefully the approach presented here will provide some guideposts and its further use might render some fresh insights about what is "rational" social action. A more informed perspective on management effectiveness is only the beginning. The ultimate applied goal is to define the essence of emergency management and what reasonably it can be expected to accomplish in

normal (the hazards research tradition) and emergency (the disaster research tradition) situations.

In that regard, while the data examined are directed largely to the emergency period, the approach can be used just as well (and probably more easily from the standpoint of data collection) to "steady state" functions such as preparedness, hazard analysis, structural and nonstructural mitigation, and reconstruction planning (Burton, Kates, and White, 1978; Mileti, 1980). Context is probably critical for interpreting patterns of organization and their management implications. For example, past research and considerable sociological theory indicate that disasters are characterized by "mechanical solidarity" and normal periods by "organic solidarity" (Turner, 1967; Fritz, 1961; Durkheim, 1947). The many nonroutine and urgent demands of disasters, combined with the "informal mass assault" (Barton, 1969; Fritz and Mathewson, 1957), suggest that domain initiated patterns will not dominate all others during the emergency period. It follows logically that "management" can be flexible about domains (these problems will tend to resolve themselves), but it should consider carefully the relationship between demands, human and material resources, and tasks. On the other hand, domain issues are critical during normal periods. Here "management" can more readily assume the articulation of tasks with human and material resources, but must be highly sensitive to creating and maintaining viable domains in what amounts to an indifferent or even hostile environment (Wright et al., 1980).

Taking this one more step, suppose that future research shows that patterns of organizing for respective functions varies significantly by type of hazard. The next step will be to identify explanatory properties of events. In effect, the field will have to consider what it has generally avoided--namely, defining what a hazard or a disaster is as physical and social condition (Quarantelli and Dynes, 1977). The problem is taxonomic, very difficult, but solvable. Such an effort would have direct implications for emergency management. For example, the U.S. Federal Emergency Management Administration (FEMA) is involved in a variety of functions for both nonnuclear and nuclear hazards, emergencies, and disasters--including nuclear war. I suspect that emergency managers (and I trust, political officials) from various parts of the world would welcome guidance about the applicability and limits of emergency management principles (Perry, 1982).

Implications for Sociology

Implicating studies from an interdisciplinary specialty to any single discipline benefits both specialty and discipline. The need to merge "collective behavior" and "organizational perspectives," for example, seems a critical but neglected objective for both disaster research and sociology (Weller and Quarantelli, 1973; Quarantelli and Dynes, 1977; Perry, Lindell and Green, 1981). The routine-nonroutine

continuum proposed here is one way to capture these perspectives within a single framework--reflecting the structural dynamics of organization and the processual dynamics of collective behavior that attend to alternative forms of association. Questions about organization are important regardless of whether the topic is disaster, the production of goods and services, social class, community, the development of scientific knowledge, foreign relations, and a host of other things social (Turner, 1967; Marx and Wood, 1975). Elemental social to more formally organized activities are part and parcel to the same underlying processes of organization, whose elements and patterns can be grasped.

Certainly much needs to be and will be said in subsequent papers about such key concepts as conflict and power. I have not discussed conflict, in part, because much of the work on this topic reduces organization to the sentiments and behaviors of individuals (Hall, 1982; Perrow, 1979). More important, while conflict certainly exists (Benson, 1977a), it is but one expression (there are many) of social action that may be variously related to organizational dynamics. In any event, I find strange the practice of assuming organization in order to examine conflict within or between organizations. Stated another way, where conflict is treated in individualist terms, or where the existence of organization is simply assumed, conflict is oversold as a dynamic process because its consideration invokes such a static view of organization. Power has not been discussed thus far, except by implication (Benson, 1977b). I suggest that power within organization (control) is defined by its very presence. That is, activities and resources are a part of organization when they are undertaken with reference to the domains and tasks of some identifiable social unit. Power of organization is defined by the consequences of the organization's activities (control over events) for more encompassing systems of which it is a part. Both of these interpretations of power are consistent with Weberian, Durkheimian, and functionalist perspectives on organization. My intent is to develop a cybernetic interpretation of power which equates it with the quantity and generality of nonrandom information produced or received by an organization (Stinchcombe, 1968).

One final thought. Many have asserted that if social science is to advance, ways of integrating "micro to macro" levels of analysis and "subjective to objective" methods of analysis must be discovered. Blalock (1979) in sociology, for example, defines the problem largely as one of measurement and statistical aggregation and disaggregation; while Ritzer (1981) points to the necessity of an integrated paradigm. Yet it is possible that the problem is not one of integrating levels of analysis, but of keeping their respective boundaries well-defined. In that regard, a more coherent structuralist epistemology and perhaps ontology is needed (Grafstein, 1982; Mayhew, 1982). That won't happen until many more "exemplars" of structuralism are advanced (Blau and Merton, 1981). Hazards and disaster research

provides an excellent opportunity to develop some. As that happens, both specialty and social science will benefit.

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