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Disaster and the Restructuring of Organization

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DISASTER AND THE RESTRUCTURING

// OF ORGANIZATION

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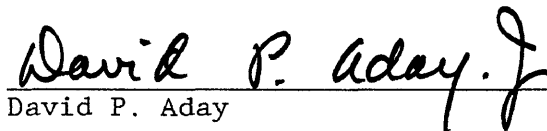
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DEDICATION

To Rev. DeWayne K. Kolbo

To strive, to seek and not to yield.

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ABSTRACT

     The unit of analysis for this thesis is the restructuring of
organization. Restructuring is examined with respect to a structural
theory and taxonomy of forms of human association in disaster. The
taxonomy points to four elements as discrete dimensions of structure.
Domains(D) and tasks(T) are interpreted as ends of organization: their
restructuring empirically grounds substantive rationality. Resources(R)
and activities(A) are interpreted as means of organization: their
restructuring empirically grounds administrative rationality. Case
materials on emergency responses following a tornado describe 57
restructurings by 22 social units over an 18 month period. A logical
metric describes the form of restructuring as falling on a continuum of
administrative to substantive rationality. The thesis also emphasizes
the analytical importance and distinctiveness of temporal and spatial
characteristics of restructuring.
     The findings indicate that there are alternative but not an
unlimited number of ways in which restructuring can take place. The
findings also suggest that there is a paradoxical relationship between
administrative and substantive rationality. Each is telling strength
and weakness of organization. A balance between them enhances
efficiency and effectiveness of response. Finally, the findings show
that the order, timing, location, and dispersion of multiple
restructurings by the same unit are related in numerous ways that can be
calibrated.

DISASTER AND THE RESTRUCTURING

OF ORGANIZATION

INTRODUCTION

> Structure itself is revealed in society's becoming and one can
> only illuminate it on condition of not losing sight of this
> process of becoming. It (social structure) is constantly
> becoming and changing (forming and breaking down); it is life
> having crystallized to a degree; and to distinguish it from
> the life from which it derives or the life that determines it
> amounts to dissociating inseparable things. (Durkheim, 1900
> in Wilson, 1981, pp 1060)

The analytical status of social structure prompts one of the most

venerable debates within sociology (Grafstein, 1982: Mayhew, 1982).

For those who assume it, structure defies simple interpretation. At the

same time its reality is, in the Durkheimian sense, a matter of

"becoming and changing" (Wilson, 1981:1060). The focus of this thesis

is not specifically on the process of becoming, but rather on the

dynamics of changing or restructuring. Despite the often heated debates

about the existence of structure, the matter of its restructuring is as

complex as the idea of structure itself.

If structure exists, is it a thing or process? In either case, how

does structure change? Is restructuring a form of collective behavior

or does it reflect formal rationality? Is restructuring driven by the

human actor, or is the actor constrained by the unit in which

restructuring takes place? Precisely how does restructuring occur? Can

restructuring be spatially or temporally bounded? All of these

questions are relevant to this thesis. The major task is to capture the

dynamics of restructuring at the empirical level. This is done by

extending Kreps' organizational theory (1978;1983;

1984;1985a;1985b;1986) through reanalyses of archival data on the

delivery of mental health services following a tornado. Just as with Kreps' earlier work on some 15 natural disasters in the United States, the archival data on this event was developed from earlier studies by the Disaster Research Center (Taylor, Ross, and Quarantelli, 1976).

A SUBSTANTIVE BASE: KREPS' THEORY AND TAXONOMY

Kreps focuses on structure and process at the same time in his theory of organization and disaster. His work pays close attention to the classical writers in sociology and their puzzling about the dynamic and static aspects of collective life (Kreps, 1986). The result is a precise definition and empirical grounding of organizing patterns within a broader taxonomy of the forms of human association.

Kreps' theory isolates four structural elements as individually necessary and collectively sufficient for organization to exist: domains (D), tasks (T), resources (R), and activities (A). Domains and tasks are interpreted as _ends_ of organizations; resources and activities as its _means_. The elements are defined as follows:

> 1) _Domains_ are collective representations of bounded units and their reasons for being. Expressed in and legitimated by the communications of direct participants _and_ others interacting with them, the existence of a domain evidences social structure as _open system_ of human action (Levine and White, 1961; Thompson, 1967; Haas and Drabek, 1973).

> 2) _Tasks_ are collective representations of a division of labor for the enactment of human activities. Tasks _independently_ define the unit quality of human action by pointing to a _closed system_ that is structured from within. Tasks are expressed in and legitimated by the communications of those enacting them.

3) <u>Resources</u> are the material technologies and subjective attributes of human populations. Resources are both static and dynamic. They are static because, as part of structure, their relevance is conditioned by the reality of domains and tasks. They are dynamic because domains and tasks are social constructions of human beings.

4) <u>Activities</u> are the conjoined actions of human populations which at once establish and are conditioned by social structure. Analytically distinct from all other elements, activities relate symmetrically with structure and its interpretation as unit and process.

It must be emphasized that each of the four elements is <u>uniquely</u> important for a processual approach to structure. Thus, neither ends (D, T) nor means (R, A) has analytical primacy. Certainly D, T, R, and A are all grounded in the human actor, as reality and creator of social structure. However, each element is grounded equally in the social unit, as reality and constraining force. While the elements need not be arranged in any particular sequence, their <u>mutual co-presence, as organization</u>, enhances the possibility for consideration of its <u>restructuring</u>. In developing a precise definition of organization as ongoing process, Kreps provides new directions for empirical studies of organizing.

Central to his approach, Kreps (1985) highlights three system states of organization (Dubin, 1978): <u>origins</u>, <u>maintenance</u>, and <u>suspension</u>. In defining origins, the crescive nature of organization is emphasized. Organization is in a state of becoming. Specifically, each element comes into play individually as one of four stages of origins (1, 2, 3, and 4 elements present; e.g., A, A-R, A-R-D, A-R-D-T). Table 1 presents all logically possible arrangements among the four elements of organization. As entity, organization is represented <u>by the mutual</u>

Table 1: Taxonomy of the 64
Forms of Association

One Element Forms	Two Element Forms	Three Element Forms	Four Element Forms
D	D-T	D-T-R	D-T-R-A
T	D-R	D-T-A	D-T-A-R
R	D-A	D-R-A	D-R-A-T
A	T-R	D-R-T	D-R-T-A
	T-A	D-A-T	D-A-T-R
	T-D	D-A-R	D-A-R-T
	R-A	T-R-A	T-R-A-D
	R-D	T-R-D	T-R-D-A
	R-T	T-A-D	T-A-D-R
	A-D	T-A-R	T-A-R-D
	A-T	T-D-R	T-D-R-A
	A-R	T-D-A	T-D-A-R
		R-A-D	R-A-D-T
		R-A-T	R-A-T-D
		R-D-T	R-D-T-A
		R-D-A	R-D-A-T
		R-T-D	R-T-D-A
		R-T-A	R-T-A-D
		A-D-T	A-D-T-R
		A-D-R	A-D-R-T
		A-T-D	A-T-D-R
		A-T-R	A-T-R-D
		A-R-D	A-R-D-T
		A-R-T	A-R-T-D
4	12	24	24

Total Forms of Association = 64

co-presence of all four elements. Thus, it is only by specifying

patterns of emergence of the elements that origins can be revealed.

In his earlier work, Kreps (1985) concentrates on the origins of

organization, using the disaster event as catalyst for describing how

organization comes into being. The following are illustrations of the

process that is described. They are two of 423 instances of

organization from 15 natural disasters (earthquakes, floods, tornados,

hurricanes) that Kreps has located from the archives of the Disaster

Research Center (DRC).

Four Element Form: A-R-D-T

Flood waters rise over a period of days in the community
and are monitored. Flooding eventually covers much of an
urban area and virtually the entire downtown of its major
city. There are few deaths or injuries but extensive property
damage. Major flood conditions prevail for over a week. The
police department initially is involved in traffic control
during the emergency period, but that action terminates with
the complete inundation of central city streets. Several
citizens with boats docked in the downtown area conjointly
begin evacuating people from buildings. Their preliminary
actions are independent of anything being done by the police
department. In fact, police officials note that, at this
point, they are looking for something to do. There has been
no preplanning for what follows. Having a few boats of their
own, the police coordinate their evacuation actions with those
of private citizens (A). The need to evacuate the entire
downtown area quickly becomes apparent. A large number of
boats from other private owners, the bureau of land
management, the fire department, and the military are
provided. The latter public bureaucracies also offer
personnel to drive some of the boats, and some citizen
volunteers respond to the same need. By now, the majority of
police personnel have become involved because they are
available, in close proximity, and know where to take evacuees
(R). The following morning, local government leaders declare
the downtown evacuation as the responsibility of the police
department (D). This is questioned briefly but then accepted
by fire department officials and is further legitimated by
state and military officials. The police then quickly develop
a rather complex task structure -- one that involves locating,
notifying, dispatching, and refueling of boats, assigning of

police personnel to all boats, and coordinating of water and ground transportation to move evacuees to shelters (T). About 5000 people are evacuated during the next 3-4 days. The operation is maintained by the police department until the demand is met (1985:10).

Four Element Form: D-R-A-T

A temporary morgue is set up after a tornado. The county coroner is not a doctor but a local funeral director. He has no coroner's office, no staff, and no morgue. Normally, he simply signs autopsies after they are completed by hospital pathologists. After the tornado, spokesmen for the only hospital say their staff cannot handle those killed by the event. A discussion by the coroner and two pathologists at the hospital leads to a decision to set up a temporary morgue. The coroner requests use of the local YMCA for the morgue. The YMCA director accedes to the request (D). The coroner, the two pathologists, a licensed embalmer, and a marine recruiter go to the YMCA. The YMCA provides several rooms and a couple of staff (R). Concurrently, ambulances start bringing bodies to the morgue; people come to the morgue concerned about the missing; bodies start to be identified (no autopsies are done and none is intended); and ministers who stop by or come with concerned residents start attending to the needs of the bereaved (A). The need for "organization" is expressed by the key participants. The identified and unidentified dead are physically seperated, with the two pathologists attending to them. The licensed embalmer and marine recruiter take on paper work tasks. The coroner maintains liaison with the hospital, funeral homes, and next of kin. Two ministers are asked to remain and attend to the needs of the bereaved at another location in the building (T). The morgue closes about 24-30 hours after it opens (1985:11).

In the above illustrations, the emergence of organization is captured: from one (A or D), to two (A-R or D-R) to three (A-R-D or D-R-A), and finally to four element (A-R-D-T or D-R-A-T) forms of association. In the first case, notice that an existing social unit (police department) improvises in this particular instance: the activities (A) of individuals are pivotal initially, with major resources (R) being mobilized next. Legitimation is then given to the social action (D) and this is followed by a clearer delineation of tasks

(T). The illustration indicates that an _established unit_ enacts a _new domain_. But in fact, some established organizations do not act at all for a time following the event. And there are other instances of organization--such as the second example of an emergency morgue--where there is no predisaster unit. While the morgue exhibits the entity status of organization just as well as the police department, its form of origins is very different.

Once again, using the disaster event as catalyst, Kreps documents each element as it relates to the origins of organization. Individually necssary and collectively sufficient conditions of organization are met when the last element is in place [in these examples, tasks (T)]. Only then does organization move to the second system state, which is termed the maintenance of organization. Anything that subsequently occurs, with respect to an instance of organizing, involves _restructuring of the four elements until such time as organization is suspended_ (the absence of one of the elements). Referencing the above case descriptions, changes in the operations of the police over the next 3-4 days of the emergency response, or changes in the operations of the emergency morgue over a matter of hours can be represented as the restructuring of the elements.

The foci of this thesis are forms of association enacted during the _maintenance state of organization_. Where Kreps does not assume the existence of organization, _here the existence of enacting units is taken as given for purposes of describing restructuring of the elements_. In other words, what takes place following the event is described in this thesis as a continuing process of restructuring of elements with respect

to each other. Thus in contrast to Kreps' earlier work, we do not describe the origins of the enacting units. Rather we have assumed that the transition from origins to maintenance is one of logical necessity. From this standpoint, it makes no difference how long it takes to reach this system state (maintenance), nor is there a concern with the arrangement of the four elements prior to it. Rather, organization now exists and is in the process of restructuring. Capturing that restructuring requires (1) documenting changes in domains (D), tasks (T), resources (R), or activities (A) and (2) describing their patterning as alternative forms of association (1-4 elements present).

INSTANCE OF RESTRUCTURING AS UNIT OF ANALYSIS

As implied above, the unit of analysis for the thesis is the instance of restructuring: one that is spatially and temporally bounded. Restructuring can be characterized as the variable presence of the four elements during some measurable period of time. Variable presence simply means that the elements exist but are changing in various ways. For example, the circumstances of disaster point to organizational contingencies or problems. Thus one or all of the elements may be restructured because new circumstances demand adaptation. If the contingency is resolved, organization continues until a new contingency arises or the final stage of organization (suspension) is reached. A successful ending of organization can be termed need met, response terminated.

Kreps (1985b:28) characterizes restructuring in this way:

An element related contingency arises. For example,
transportation is disrupted because a bridge washes out
(activities related). A piece of important equipment is
damaged or destroyed, or participants quit because of
exhaustion or role conflict (resources related). Plans become
confused and it is not clear what will be done next (tasks
related). Objectives are challenged by participants or those
on the outside (domain related). If the contingency is
resolved through restructuring of the elements, organization
is sustained until the end state is reached....or some new
contingency appears.

Administrative and Substantive Rationality

Regardless of the catalyst for change, any restructuring of domains

(D) and tasks (T) provides an indication of what Kreps terms substantive

rationality. Restructuring related to resources (R) and activities (A)

is an indicator of what he terms administrative rationality.

Substantive rationality suggests that participants are preoccupied with

the ends of organization. That is to say, domains (D) and tasks (T),

are being questioned or redefined as a result of social action.

Conversely, administrative rationality suggests that participants are

preoccupied with the means of organization. In other words, resources

(R) and activities (A) are being restructured to meet the requirements

of relatively fixed domains (D) and tasks (T).

While both administrative and substantive rationality are critical

to the viability of organization, their relationship is a paradox. The

strength of administrative rationality (e.g., a regularly updated

disaster plan which formalizes a unit's response) is that things get

done. Still, too much of it thwarts improvisation and the latter is

essential when circumstances are difficult to control. The presence of

improvisation points to substantive rationality. However, too much

questioning of what is being done, and how, may exacerbate the physical

harm and social disruption resulting from the event. It also may undermine the credibility of the responding unit. Thus, focusing on either ends (substantive rationality) or means (administrative rationality) without involving the other, may inhibit effective performance in the face of altered or changing conditions. Stated another way, both administrative and substantive rationality are essential to the viability of organization and at the same time threaten it.

Substantive rationality points to the human actor as prime mover of social structure (ends oriented, actor dominated). Administrative rationality expresses social structure as the dynamic force which constrains the individual and maintains the unit (means oriented, unit dominated). Their relationship during maintenance is very difficult to capture empirically. With measurement much less precise than will be developed here, Kreps earlier found that the two are positively related. This suggests that ends (D, T) and means (R, A) based restructuring are part and parcel of the viability of any organization. Where the unit (ends) dominates what is happening, restructuring tends to be confined to organizational means. Action takes place but the actor is object of structure. Conversely, where the actor (means) dominates, ends are being questioned and possibly altered. Order is maintained, but the actor is subject of structure. The implied goal for emergency management is complementarity between constraining unit and administrative rationality on the one hand; and accomplished actor and substantive rationality on the other. In effect, complementarity is the successful integration of the ends and means of social structure.[1]

Spatial and Temporal Dynamics of Restructuring

Restructuring can also be articulated with respect to time and space. As Wallace (1983:134) suggests, "certain social phenomena may be observed virtually everywhere but only at certain times....whereas other social phenomena may be observed virtually everywhen but only at certain places." His point is that spatial and temporal dimensions are unique and vital for describing any social phenomenon (Collins, 1981; Wallace, 1983). Because disasters can reasonably be demarcated as bounded events, they provide strategic research sites for describing the temporal and spatial properties of restructuring.

Wallace provides several (he deems them parallel) properties of time and space which will be used in describing restructuring of domains, tasks, resources, and activities. The relevant temporal dimensions are termed (1) order, (2) timing, (3) rhythm, and (4) periodicity of restructuring. The relevant spatial dimensions are termed (1) location, (2) dispersion, (3) pattern, and (4) uniformity of restructuring.[2] The first and second properties in each set will be used to describe all instances of restructuring. The third and fourth properties in each set will be used to describe the patterning of multiple instances of restructuring by the same unit. Each of these properties is briefly defined below.

With regard to temporal properties, order involves the empirical determination of which elements (1-4) change in any instance of restructuring and their sequence (see Table 1). Temporal timing is the elapsed time from an identified catalyst to change in the first appearing element, and to change in any subsequent element restructured

(first to second, second to third, and third to fourth). Temporal rhythm is then evidenced by regularity in the order of the elements across multiple instances of restructuring by the same unit. Similarly, periodicity is then evidenced by any regularity in the timing of elements across multiple instances of restructuring. It is important to distinguish between rhythm and periodicity. Thus a sequence of several restructurings (e.g., A-R, A-R, A-R and administrative rationality) could involve the same ordering of the elements (rhythm), while the time lags between appearance of elements could be very different (periodicity).

With regard to spatial properties, location is the geographic locus of the unit's action (in this case local or county) during any instance of restructuring. Spatial dispersion is evidenced by the number of activity sites of the unit's action during any instance of restructuring. Spatial pattern is then evidenced by regularity in the location of the unit's action across multiple instances of restructuring. Similarly, uniformity is then evidenced by regularity in dispersion of the unit's action across multiple instances of restructuring.

DISASTER EVENT AS CATALYST

Disasters are useful catalysts for examining the restructuring of organization (Dubin, 1978). They can readily be viewed as non-routine events in which a community and its sub-units are faced with unusual and severe circumstances. When a disaster strikes, the normal condition of

the community can no longer be assumed. For example, the impact of the disaster might be such that many existing organizations undertake different activities from their pre-disaster routines. In the Durkheimian sense, the units can be considered as becoming something else. But that becoming is as much derivative as it is emergent. Such transformations are interpreted as instances of restructuring. They are documented in this study by responses of mental health units following a tornado which struck a mid-western community.

The Event

The tornado which struck the site of the original DRC research was part of a regional disaster. As stated by the authors of the original study,

> At least 148 tornadoes gouged paths through more than 200 counties in 13 states. The tornado that struck the community thrust it into the limelight as one of the single worst community disasters in the history of the United States. The tornado wreaked physical damage and ripped the very fabric of social life....at the interpersonal level, there were serious strains. (Taylor, Ross, Quarantelli, 1976:60)

Familial, community, business, and religious life, as well as other aspects of human interaction, were severely disrupted. Very few households in the community were left untouched, with the result that social bonds were profoundly affected. It was from this set of circumstances that the ostensible need for disaster related mental health services was determined. But as the process of determining the mental health needs of the victims of the tornado began, there was no clear-cut perception of what those needs might be. Indeed, there was general confusion among the various professionals and laypersons

involved about what to do. Were they dealing with problems of living or mental health trauma? In either case, would needs of victims be of short or long term duration? Over time a consensus was reached that mental health problems resulting from the disaster would arise most significantly in the long run.

The Original Study

The focus of the original study was on the delivery of mental health services over an 18 month period following the tornado. The initial reactions at the local level were somewhat mixed: from inaction, to reaction, to action and change. That is, the first response of the established local mental health units (some 10 units providing psychological or psychiatric services) was inaction. Federal agencies suggested (strongly) that this was inappropriate. As a result, these and some 19 other local units (e.g., churches, hospitals, social service agencies) moved to develop a program. For all intents and purposes, their first attempt to provide disaster services related to mental health was a failure. The failure then led to the establishment of a new program. The new program emphasized a broad range of victim needs, only some of which related to traditional mental health models.[3]

Implementation of the new program improved upon the initial attempt. The new system provided more timely services related to the disaster. It established a more identifiable area of operations and a different set of interactive components. What amounted to a new system enabled units providing services to expedite their efforts on behalf of disaster victims. The authors of the original study concluded that the established mental health system was unable to adapt to the new

situation while the _emergent_ system was able to develop a more coherent framework within which to work. They argued that the effectiveness of the new system surpassed the abilities of its predecessor.

Structural Observations

While the final report from the original study provides many interesting observations and conclusions about the established and emergent mental health systems, there is an important omission from the standpoint of a structural perspective on organizing. Simply put, the existence of the old system was assumed in the original study and the effort was to characterize its transformation. Thus, attention was directed to _the system as a whole_ rather than the manner in which units within it were restructured for purposes of meeting disaster demands. The focus of the present research is _restructuring of the member units_. By using Kreps' core species concept of organizing (patterns of transformation of D, T, R, and A), we hope to describe how the restructuring of member units took place. Particular attention will be given to measurement of (1) administrative and substantive rationality, (2) time and space dimensions of organizing, and (3) characteristics of enacting units that shed further light on the process of restructuring.

A METHODOLOGICAL APPROACH TO RESTRUCTURING

The data used for this research are archival material maintained by the Disaster Research Center (DRC) at the University of Delaware. While the original research was not done with Kreps' theory and this extension of it in mind, it does provide useful data on instances of restructuring

over an 18 month period following the event. Indeed, our review of the interviews and related case materials from the study reveals some fascinating accounts of what occurred as a result of the disaster.

The Data Base

The thesis focuses on 123 interviews and supporting documents earlier derived by DRC for the disaster event. The interviewees were direct participants in the established and emergent systems. The documents relate to unit accounts of what took place. Using this archival material to construct a new data file, a sample of 57 instances of restructuring has been developed. The 57 cases located were enacted by 22 social units. In all cases the description of the restructuring is tied to one of the 64 logical possibilities in Kreps' earlier taxonomy (see Table 1: 1-4 elements of organization restructured). This allows for a determination of the extent to which restructuring reflects administrative (means-based) to substantive (ends-based) rationality. Moreover, the various dimensions of time and space developed above from Wallace's work (1983) are grounded empirically. All of this informs our attempt to describe restructuring as process. Finally, a variety of other structural properties of the enacting unit are measured as they inform description of the 57 cases.

The methodology used is both qualitative and quantitative. That is, measurement of restructuring is captured initially through qualitative descriptions of what happened, then patterning of the elements relevant to each restructuring is expressed quantitatively. The strategy employed is as follows: First, a description of what occurred at each stage of restructuring is developed from the data, with

particular attention paid to its formal, spatial, and temporal

characteristics. Second, this allows (a) a determination of the extent

to which the restructuring reflected administrative and substantive

rationality; (b) the measurement of basic temporal (order, timing) and

spatial (location, dispersion) variables for all cases of restructuring;

and (c) the measurement of derived temporal (rhythm, periodicity) and

spatial (pattern, uniformity) variables when an enacting unit had two or

more sequential instances of restructuring. Third, other structural

variables of the enacting units that might have influenced the process

of restructuring are measured for purposes of enhancing description. A

more specific detailing of the major variables follows.

Administrative and Substantive Rationality

The logical measurement (base metric) found on Table 2 expands on

Kreps' metric of the 24 organizational forms (Kreps, 1985a) by

incorporating the remaining 40 forms of association in the taxonomy.

While Kreps' earlier metric was applied to the origins of organization,

that employed in the present study is intended to capture the system

state of maintenance. Each of the 64 forms listed on Table 1 are

represented in this study as discrete instances of restructuring:

represented as one, two, three or four element forms of association. As

ends of organization, changes in domains (D) and tasks (T) reference

substantive rationality. As means of organization, changes in resources

(R) and activities (A) reference administrative rationality.

For each case of restructuring located, a change of D or T (or

both) is indicated by plus (+) signs. A change of R or A (or both) is

Table 2: Basic Metric
Means-Ends Restructuring

+2	+1		0		-1		-2
DT	D	T	DR	RD	R	A	RA
TD			DA	RT			AR
			TR	AD			
			TA	AT			
	DTR	TRD	DTRA	DRAT	DRA	RDA	
	DTA	TAD	DTAR	DART	DAR	RTA	
	DRT	RDT	DRTA	TRAD	TRA	ADR	
	DAT	RTD	DATR	TARD	TAR	ATR	
	TDR	ADT	TRDA	RADT	RAD	ARD	
	TDA	ATD	TADR	RATD	RAT	ART	
			TDRA	RDAT			
			TDAR	RTAD			
			RDTA	ADRT			
			RTDA	ATDR			
			ADTR	ATRD			
			ARTD	ARDT			
Scores **+2**	**+1**		**0**		**-1**		**-2**

indicated by minus (-) signs. The resulting scoring runs from a +2 (ends predominate) to -2 (means predominate) with a mid-point of 0 (balance or tension). For example, a T-D-R form of restructuring is represented by two pluses (for D and T) and one minus (for R). The aggregate score is +1 indicating the predominance of ends in the restructuring process. Conversely, an R-D-A form of restructuring receives two minuses (for R and A) and one plus (for D). The aggregate score is -1 indicating the predominance of means in this instance of restructuring. As an exercise in logic, then, note that all four element forms must yield scores of 0 (various combinations of two pluses and two minuses); all three element forms are either +1 (two ends and one means implicated) or -1 (two means and one end implicated); two element forms yield scores of +2 (ends only), -2 (means only), or 0 (one of each); and one element forms have scores of +1 or -1 (one end or one means). The result is a normal distribution of the 64 forms in Kreps' taxonomy.

The base metric presented on Table 2 only captures the relative presence of ends and means in each instance of restructuring. It is not sensitive to the actual number of elements implicated, nor does it capture their ordering (e.g., D-A versus A-D). The derived metric found on Table 3 builds these dimensions directly into the scoring: by weighting the value of earliest appearing elements; and decreasing that weighting as each additional element comes into play. Specifically, the plus or minus sign for the first appearing element in any instance of restructuring is weighted by four times. Thus a D or T receives a score of +4 as first appearing element; and an A or R receives a score of -4

as first appearing element. The second appearing end (+) or mean (-) is
weighted by 3 times (+3 or -3); the third appearing element by two
times (+2 or -2); and the fourth appearing element is not weighted at
all (+1 or -1).

As shown on Table 3, the result is a distribution of scores which
reflects pure types of administrative (R-A and A-R) and substantive (D-T
and T-D) rationality at the extremes of the distribution (+7 and -7);
mixed types which reflect a balancing of the two forms of rationality at
the midpoint (0); and mixed types which reflect gravitation toward
either pole of an underlying continuum between them. Either end of that
continuum points to the paradox of accomplished actor and dynamic unit
in social structure. Just as with Kreps' earlier work, the metric is
designed to merge qualitative description of the content of social
structure, with quantitative depiction of its formal properties.

Spatial and Temporal Dynamics of Restructuring

The previously discussed temporal properties of restructuring are
captured in the following manner. The temporal order of each case
involves judgments (through descriptions of what happened) of which
elements of organization were restructured (dichotomous choices) and in
what sequence (what changed first and so on if additional elements came
into play). Using the onset of the tornado as the starting point,
timing is measured in days and hours with respect to when those elements
restructured were changed. For one-element forms of restructuring,
timing is represented by the lag between the event and the
restructuring. If additional elements came into play, timing is

Table 3 – Derived Metric:
Administrative versus Substantive Rationality

+7	+6	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5	-6	-7
DT	D	DTR	DTRA	DRT	DRTA	DR	DRAT	RD	RDAT	RDA	RADT	RAD	R	RA
	T	DTA	DTAR	DAT	DATR	DA	DART	RT	RTAD	RTA	RATD	RAT	A	
		TDR	TDRA	TRD	TRDA	TR	TRAD	AD	ADRT	ADR	ARDT	ARD		
TD		TDA	TDAR	TAD	TADR	TA	TARD	AT	ATRD	ATR	ARTD	ART		AR
						RDT	RDTA	DRA						
						RTD	RTDA	DAR						
						ADT	ADTR	TRA						
						ATD	ATDR	TAR						

measured by the lag between the appearance of each one (second, third, or fourth). A derived <u>total time of restructuring</u> is the lag between the onset of the event and the end-state of the restructuring.

For some units in the file there is sufficient data to capture multiple instances of restructuring. The problem here is to determine points of discontinuity between restructurings, such that organization is said (analytically) to be at rest during the interim. Points of temporal discontinuity and the appearance of additional catalysts for change provide the empirical foundation for these determinations. Such additional catalysts in this study are represented by a diverse range of subsequent contingencies (such as competitive or cooperative relationships with other units) and proactive changes by the enacting unit (such as an attempt to expand a domain).

Once multiple instances of restructuring are documented, the presence or absence of temporal <u>rhythm</u> is then determined by comparing the derived metric scores (see Table 3) across the two or more cases. Similarly, the presence or absence of <u>periodicity</u> is determined by comparing the time lags between catalysts and appearance of elements. A final temporal measurement represents the total time the enacting unit was engaged in disaster related action. Involvement begins at the point of the unit's initial commitment to disaster related activities. It ends with the last documented action by the enacting unit. Just as with instances of restructuring, total time of involvement is measured in days and hours.

The previously discussed spatial properties are measured in the following way. <u>Location</u> refers to the geographic locus of the unit

during the restructuring: in this study within the political boundaries of the locality, county, or state. Dispersion is a measure of the number of specific sites of a unit's action during a restructuring: in this study one site, two to four sites, or five or more sites. Where there were multiple instances of restructuring, pattern then measures the consistency or inconsistency of location across multiple cases. In like derived fashion, uniformity measures the similarity or dissimilarity of dispersion across multiple cases.

Enacting Unit Chacteristics

Five variables reflect closed system characteristics of the enacting units. First, because those units providing services to disaster victims were both mental health and non-mental health related, the former is distinguished from the latter. Second, the size of the enacting unit is measured as an ordinal scale: 9 or fewer members; 10-20 members; 21-50 members; 51-100 members; and more than 100 members. An ordinal scale is used because finer distinctions could not be made from archival data for many units in the study. Third, the number of subunits is a general measure of the structural complexity of the enacting unit. Fourth, the number of tasks (during the disaster) is a general measure of the formalization of the enacting unit. Fifth, the presence of conflict (overt disagreement) within the enacting unit about what it was doing at any point during its response is represented as presence or absence (yes or no).

Four variables reflect open system characteristics of the enacting units. First, those cases where the motivation to restructure came from other units are distinguished from those where the restructuring was

internally generated. Second, the complexity of the social environment of the enacting unit is measured as the number of units in its social network during restructuring. Note that such linkages involved various combinations of local, state, and national organizations. Note also that the total number of linkages could vary across multiple instances of restructuring by the same unit. Third, the presence of conflict (overt disagreement) between the enacting unit and at least one other unit about what it was doing at any point during its response is represented by a dummy variable (yes or no). Fourth, a determination of whether the response was beneficial for the enacting unit was measured by status enhancement. Specifically, if the restructuring resulted in an increase in status--as communicated by units in its broader social network of the enacting unit--it was so designated.

DESCRIPTIVE FINDINGS

A total OF 57 cases of restructuring (enacted by 22 social units) have been reconstructed from archival descriptions of the delivery of mental health services to victims following the tornado. Table 4 arrays the 57 cases by form type (see Table 1) and derived metric score (see Table 3). Note that 28 percent (18/64) of the logically possible forms of restructuring have been located at least once. This includes 3 of 4 one-element forms, 6 of 12 two-element forms, 3 of 24 three-element forms and 6 of 24 four element forms. The marginal distributions indicate that over two-thirds of the cases are one- (N=25 or 44 percent) or two- (N=13 or 23 percent) element forms of restructuring. Three-element forms represent 12 percent (N=7) of the cases and

Table 4: Distribution of the 64
Forms of Restructuring

Form	Freq	Metric Score
D	--	+4
T	1	+4
R	27	-4
A	3	-4
4	31	

Form	Freq	Metric Score
DT	-	+7
DR	1	+1
DA	-	+1
TR	1	+1
TA	1	+1
TD	-	+7
RA	6	-7
RD	-	-1
RT	-	-1
AD	-	-1
AT	1	-1
AR	3	-7
12	13	

Form	Freq	Metric Score
DTR	-	+5
DTA	-	+5
DRA	-	-1
DRT	-	+3
DAT	-	+3
DAR	-	-1
TRA	3	-1
TRD	-	+3
TAD	-	+3
TAR	-	-1
TDR	-	+5
TDA	-	+5
RAD	-	-5
RAT	-	-5
RDT	-	+1
RDA	-	-3
RTD	-	+1
RTA	3	-3
ADT	-	+1
ADR	-	-3
ATD	-	+1
ATR	1	-3
ARD	-	-5
ART	-	-5
24	7	

Form	Freq	Metric Score
DTRA	7	+4
DTAR	-	+4
DRAT	1	0
DRTA	1	+2
DATR	-	+2
DART	1	0
TRAD	-	0
TRDA	-	+2
TADR	-	+2
TARD	-	0
TDRA	-	+4
TDAR	-	+4
RADT	-	-4
RATD	-	-4
RDTA	1	0
RDAT	-	-2
RTDA	-	0
RTAD	-	-2
ADTR	-	0
ADRT	-	-2
ATDR	-	0
ATRD	1	-2
ARDT	-	-4
ARTD	-	-4
24	12	

Mean Metric Score
Median Metric Score

3 of 4 One-Element Forms: N=31 (49.0%)
6 of 12 Two-Element Forms: N=13 (21.0%)
3 of 24 Three-Element Forms: N= 7 (11.0%)
6 of 24 Four-Element Forms: N=12 (19.0%)

four-element forms represent 21 percent (N=12) of the cases. It is
evident from the table that the order or patterning of the elements
points to administrative rationality when 1-3 elements are involved (41
of 45 cases have negative scores on the derived metric); and to
substantive rationality when all 4 elements are involved (8 of 12 cases
have positive signs on the derived metric). Recall that pure balance
between substantive and administrative rationality (a score of 0 on the
derived metric) is possible only at the four-element level of form.
Three of 12 cases reflect pure balance as defined by the metric.
Overall, administrative rationality prevails in this sample of 57 cases.
This is evidenced, in part, by the tendency toward fewer elements
restructured and the mean and median scores on the derived metric (mean
of -3.5 and median of -4). But one must be careful not to overstate the
implications of this finding. Many of the cases show both means- and
ends-based restructuring taking place. This strain toward balancing of
administrative and substantive rationality is evidenced also by lower
(positive or negative) scores on the derived metric. And as will be
shown below, much of the means-based restructuring which occurred was
based on emergent rather than established ends.

With respect to the timing of restructuring, the elapsed times
between catalysts and appearing elements are as follows: The mean time
lag between catalyst and first appearing element is 6 days-7 hours,
while the median score is 1 day-5 hours (range of 1 hour to 63 days).
The distribution therefore points to a considerable degree of positive
skewness, with the bulk of the cases (42) piling up below the mean.
Where two to four elements are restructured, the mean time lag between

first and second element (N=32) is 4 days-3 hours, (median of 1 day and a range of 1 hour to 37 days); from second to third element (N=19) is 4 days-16 hours (median of 8 hours and a range of 1 hour to 70 days); and from third to fourth element (N=12) is 7 hours (median of 1 day-12 hours and a range of 1 hour to 17 days. The average total time of restructuring (N=57) is 10 days-19 hours (median of 4 days-10 hours and range of 8 hours to 81 days-12 hours). The average total time of involvement in disaster related activities by the 22 identified units was 162 days-17 hours (with a median of 63 days-12 hours and a range of 4 days-12 hours to 548 days). An overall indication of positive skewness is therefore reflected in the data, with much restructuring taking place within the relatively narrow time window of the immediate emergency period.

With respect to the two basic spatial dynamics of form, location and dispersion, 51 percent (N=29) of the instances of restructuring were enacted by units located in the impacted community and 49 percent (N=28) were enacted by units located at the county level (location). Fourteen percent of the restructurings (N=8) were confined to a single site, 18 percent (N=10) involved 2-4 sites, and 68 percent (N=39) involved 5 or more sites (dispersion).

What does the data on restructuring mean in summary form? Consistent with much contemporary research on organizing in non-disaster settings, the data suggest that restructuring following disaster tends to take place within the constraints of antecedent ends. As will be illustrated below, these ends may be either established prior to the event or emergent. When ends are established and relatively fixed,

administrative rationality prevails. Means-based restructuring implies considerable clarity about what the organization is trying to do and how. We conclude that organizational routines serve the unit well in everday as well as unusual circumstances by enhancing predictability about what is going on. But when ends are emergent--and the data suggests that this is a frequent occurrence--a more thoroughgoing restructuring of means and ends is undertaken. Here the actor innovates to enhance the performance of the unit. Perhaps a problem is being anticipated. Or maybe a problem is sufficiently telling that it can no longer be overlooked (Starbuck, 1983). In either case, the evidence indicates that often previously fixed ends are altered early in the process of restructuring. In this circumstance substantive rationality is evidenced; perhaps there is less collective clarity about what the organization is doing; but the result may be greater adaptiveness to changing circumstances.

In addition to the dynamics of administrative and substantive rationality, the timing of element changes during restructuring is an analytically distinct characteristic of form. The data indicate that, on the average, time lags between catalysts and element changes tend to decrease as more elements come into play. This means that with 2-4 element restructurings, the appearance of change in the first element is more tentative than what comes later. Note that the units in this presumed mental health delivery system had little or no disaster experience. This lack of experience implies that the people involved were uncertain about the proper courses of action. Consistent with collective behavior theory (e.g., Turner and Killian, 1972), the

resulting timing of element changes points to symbolic milling when routines are disrupted and collective attempts to reduce ambiguity. But whether it is existing or emergent ends that reduce uncertainty, once restructuring is underway a kind of structural momentum is created. This momentum is important following disaster because there is, indeed, pressure to get things done. In summary form at least, the timing of restructuring evidences that pressure. What takes place points to the relevance of both innovativeness and structural inertia.

With respect to spatial dynamics of form, the data on location conform to the historical pattern in the United States that disasters are community events and treated as such. Thus social units in close proximity to impacted areas respond quickly to local needs because there is a clear expectation that they will do so. This expectation is enhanced here by the fact that, although highly destructive, tornadoes tend to have a relatively narrow scope of impact (Dynes, 1970). On the other hand, the data on dispersion suggest that within a relatively circumscribed community response, victim services tended to be provided at multiple rather than single locations. The evidence points to an outreach approach to perceived victim needs.

The dynamics of administrative and substantive rationality, time, and space will now be illustrated by several case descriptions from the data file of 57 cases. Four examples involving 1, 2, 3, and 4 element forms of restructuring will be described and discussed. This will be followed by a description and discussion of one example of multiple restructurings by a single unit. In developing the latter example, two additional summary tables (Tables 5 and 6) which distinguish single from

multiple restructurings will be presented and their implications highlighted with respect to the derived temporal (rhythm, periodicity) and spatial (pattern, uniformity) characteristics of restructuring.

One-, Two-, Three-, and Four-Element Forms of Restructuring

Restructuring: One-Element Form - (A)
Enacting Unit: Multiple County Mental Health Agency

Case Description

The catalyst for this instance of restructuring was the tornado. Response to the event was initiated by the director of a mental health unit. The unit had extensive contacts prior to the disaster with six local organizations, some mental health related and some not. The enacting unit was not physically located in the impacted area, but in an adjoining county. It maintained a small professional staff (10-15) and over 100 regular volunteers. The unit's multiple county domain was implemented by three core sub-units: one representing each associated county. The unit's task structure was comprised of educational services, direct volunteer services, community mental health, advocacy, advisory services, and administrative services. Even as it responded to the event, the unit maintained its routine activities. During restructuring, the enacting unit was linked with six other units. These relationships had been established prior to the disaster and no new contacts were made as a result of the event.

The restructuring which occurred is judged to be an A form in Kreps' taxonomy (see Table 1). Its score on the derived metric is -4, pointing to administrative rationality. The restructuring began the morning following the disaster, some 14 hours post-impact. The total

time of restructuring was another 14 hours and was enacted from one
location. The total time of involvement of the unit in disaster related
activities was 13 days-2 hours. Further details on the restructuring
are as follows.

The director believed that his agency should offer assistance to
those groups and organizations in the impacted community with which it
maintained contacts on a routine basis. In contacting these units, his
professional staff found that they had been unable to develop plans for
dealing with the consequences of the event. Accordingly, the staff felt
that they could assist in this situation by establishing contacts, times
and places for planning meetings. Such actions were a part of the
normal functioning of the agency, but now redirected specifically to the
tornado event. Activities (A) were being restructured by the next
morning, while the remaining elements of organization remained fixed.
Over a period of about 14 hours contacts were made, and times and
locations for possible meetings involving member organizations were
arranged. The ostensible purpose of the meetings was to develop plans
for responding to the needs of victims. By arranging these meetings,
the staff felt that they were responding in an appropriate manner and,
in so doing, taking some of the pressure off local units in the impacted
area. The initial meeting was set up for the Monday following the
disaster. At that time, the professional staff turned over all
information they had on the event and meeting arrangements that they had
been involved in. Subsequent meetings were carried out in various
locations, with the focal unit continuing to assist in their
arrangement. After about 13 days, the focal unit ceased disaster

related activities altogether. At least in part, this was a function of opposition to the enacting unit's disaster related activities.

Specifically, conflict arose over the agency's role in arranging the meetings. The conflict was of an overt nature and came from the local groups and organizations that were being assisted. Many members of these latter units expressed the idea that it was not the place of an outside agency to impinge on their areas of responsibility. Many felt that the meetings were not developed with their interests in mind and that they were not properly consulted in the arrangements of meetings. The end result of this opposition was that the director of the agency indicated that his staff would stop making arrangements unless specific requests were forthcoming. In the absence of such requests, the unit ceased all disaster related activities shortly thereafter. The professional staff expressed the thought that what they were doing was worthwhile. While local groups and organizations lacked consensus on the usefulness of arrangement activities, representatives of several county, state, and federal agencies agreed that the actions of the multiple county mental health agency were beneficial. They stated that the speed with which the unit responded was central in the establishment of victim services.

Case Discussion

As described, the above case description points to a one-element form of restructuring involving activities (A). There is a strain toward administrative rationality and this is reflected by (1) the logic of the metric score (-4), (2) the rapid involvement of the agency, (3) the fact that the restructuring was a simple extension of organizational

routines, and (4) the expeditious manner in which efforts led to early results. At the same time, however, what amounted to a very efficient response led to overt opposition from the groups and organizations ostensibly being assisted. Alternative courses of action--including doing nothing for a time--appeared not to be considered. And certainly the opposition that ensued was not anticipated by the professional staff. Responding to opposition only after it became overt, the result was the suspension of a coordination role soon after it began.

One heuristic and potentially practical value of the taxonomy is that it provides a way of characterizing alternatives to what actually took place. In other words, the restructuring could have been enacted in a different way and the taxonomy shows how. For example, the manner in which meetings were arranged (T) might have been altered to accommodate the massive disruption of the early emergency period. One benefit might have been a greater <u>balance</u> of administrative and substantive rationality. But one cost might have been that the process of getting something going was unnecessarily delayed in the face of pressing victim needs. An implied disaster management objective appears to be as follows: seek a balance between administrative and substantively rationality while avoiding any trade-off in meeting victim needs in a timely manner.

<u>Restructuring: Two Element Form - (A-R)</u>
<u>Enacting Unit: Religious Social Services Organization</u>

<u>Case Description</u>

The catalyst for restructuring was the disaster event. Response by the unit began much later than that presented in the previous case

description. The delayed response was, in part, a function of the
unit's distance from the impacted area. The unit was not located within
the immediate three county area; and while it had previous contacts
with the impacted community and surrounding county because they were a
part of its formal service area, these contacts were not sustained on a
regular basis. The precise size of the unit was not indicated in the
archives, but its broad range of routine activities included marriage
counseling, family counseling, child welfare, foster care, adoption, and
parish services. These activities were performed by both paid
professionals and large numbers of volunteers. During the course of its
response to the disaster, the organization maintained links with two
units in the impacted county and one unit in the impacted community.

The restructuring which occurred is judged to be an A-R form in
Kreps' taxonomy. Its score on the the derived metric is -7, pointing to
administrative rationality. The restructuring began about 21 days
following the disaster, with the total time of restructuring being about
58 days. The total time of involvement for this unit was 548 days.
Elapsed time from first to second element was 37 days. This means that
the unit was still functioning in the impacted community at the time of
the completion of the study by DRC. The activities of the unit were
dispersed over more than five sites. As described in the archives, the
restructuring occurred in the following way.

On the twenty-second day following impact a paid professional staff
member--one who had experience working with disaster victims--was sent
to the impacted area with instructions to assist disaster victims in any
manner deemed appropriate by local authorities. The organization's

activities (A) were therefore being restructured, albeit slightly because of the disaster, and within routine guidelines of providing service where there was need. Indeed, prior to sending the professional to the impacted area, there was a formal determination that the organization would not overstep specific requests for help by local authorities. Because those requests were forthcoming, the staff member was then advised to select a permanant facility for the unit's activities. A permanant office for the unit was established some 30 days after the staff member had entered the community (R). This is judged to be a modest restructuring of resources, yielding an A-R form from Kreps' taxonomy. The data suggest that a major problem in this regard was a shortage of physical space. But once the office was set up, the professional staff person used it as base of operations for providing the organization's traditional services. The services were implemented at local parishes, schools, and the Red Cross. They continued over a period of DRC's 18 month study and were formally funded for a minimum of another 7 months.

Case Discussion

In effect, the enacting organization made a commitment to provide services, but within the constraints of a previously defined domain and tasks. Thus the ends of organization were not restructured in any way and the restructuring of means was modest. The enactment also evidences a formal decision that local prerogatives would not be overstepped. In contrast to the previous case description, one result of this decision was that no opposition developed over what the unit was doing. The involvement of the unit in disaster related activities was characterized

by others as helpful and in no way detrimental.

The means-based restructuring which took place falls at the extremes of administrative rationality (metric score of -7). The case shows that administrative rationality does not necessarily equate with speed--certainly many of the unit's services could have been provided much earlier--but also with caution and the perceived neccessity of fitting in. The restructuring was a smooth but not necessarily a timely and sufficient one. On the positive side, the unit's activities were sustained and valued by others. On the minus side, the pragmatism was arguably inefficient. Not only did the unit respond rather late, but it then took several weeks to find an office because of the limited number of physical locations available.

By the logic of the derived metric, substantive rationality was not relevant to this restructuring. This lends support to the conclusion that structural inertia is not necessarily maladaptive. But once again, Kreps' taxonomy provides ways of characterizing not only what did happen but what might have been. For example, because of the substantial resources it could draw on, the unit's response could have begun much sooner and been more elaborate than it was. But to do either would undoubtedly have involved a greater restructuring of organizational routines as well as the manner in which services were delivered on site. In that event, tasks (T) would have been restructured, and perhaps very early in the process, thus pointing to substantive rationality. In considering the proper and longer-term goals of the unit, its members did not consider short term goals of disaster victims. Yet given the nature of disaster response in the United States--and the apparent

knowledge of it by the social unit--a case can be made that the course of action taken was a suitable one.

Restructuring: Three Element Form - (A-T-R)
Enacting Unit: Counseling-Intervention Agency

Case Description

The catalyst for this instance of restructuring was the tornado. Response to the event was initiated by members of the enacting unit. The unit was physically located in the heart of the impact area and its pre-disaster domain was related to mental health. The unit had five full-time professionals and at least 45 registered volunteers. While the archives provide no indication of a breakdown of the organization into specific subunits, the agency's formally stated tasks included advocacy programs, drug education, drug treatment, suicide prevention, dating guidance, family intervention, individual intervention, V.D. counseling, birth control counseling, abortion counseling, and volunteer counseling. The unit also maintained a hot-line service. The hotline service operated on a small scale and was not defined as a major function of the unit. As a mental health agency, the unit maintained a large number of linkages with other groups and organizations prior to the disaster. Most were at the local level (18), but there were several at state (3) or national (3) levels as well.

The restructuring which occurred is judged to be an A-T-R form in Kreps' taxonomy. Its score on the derived metric is -3, suggesting the greater relevance of means as opposed to ends-based adaptation. The restructuring began 1 hour following impact, and the total time of restructuring was 13 hours. Elapsed time from first to second element

was 4 hours, and from second to third was 8 hours. While the unit's pre-disaster location was the locus of activities during and after the restructuring, the activities were dispersed over many sites (damage areas and other responding units) during the immediate emergency period as well as later. The total time of involvement of the unit in disaster related activites was over 217 days. This initial restructuring was one of several enacted by the unit (the rest will be described later as parts of a multiple restructuring example). It was enacted as follows.

The unit began responding to disaster related information needs shortly after impact (1 hour). By chance, it was one of the few units in the immediate impact area that maintained telecommunications. That, combined with public knowledge of its hotline service, resulted in the staff receiving phone calls related to the disaster (A). The volume of calls was quite high and there was initial uncertainty about what do about them. The result was a decision to suspend all routine activities and to develop a new division of labor related to monitoring calls, referring requests or offers of assistance to the proper authorities, and transmitting information by phone or by messenger (T). The focus of the initial message service related to maintaining linkages among mental health agencies. Members of the unit then recruited additional volunteers because they were needed to provide the expanded service (R). The development of what amounted to small scale message center and referral service during the emergency period took less than one full day. The service remained in operation for about two weeks, at which time most of local telecommunications had been restored.

<u>Case Discussion</u>

The above example again reveals a strain toward administrative rationality (-3 on the metric), the speed of the response was a function of a perceived need, the closeness of the unit to areas of damage, and the fact that the actions taken were an extension from organizational routines. But there is also evidence of ends-based restructuring playing a key <u>intervening</u> role. Thus routines were suspended, a new divison of labor was created, and this division of labor required a restructuring of resources. What took place is a good example of Durkheim's quotation at the beginning of this paper: the continuity and discontinuity of human action in social structure. And the greater balance between substantive and administrative rationality evidenced appeared to enhance both the efficiency and effectiveness of the unit. The restructuring of ends led to a focused information service. But the constraint of both old and new ends provided the knowledge and logic needed for using resources in an appropriate and timely manner.

Interestingly, prior to the disaster the counseling-intervention agency had been involved in a debate over the adequacy of its staff and volunteers for implementing a mental health domain. This had resulted in some opposition to the operations of the agency, particularly by an oversight board to which the unit was responsible. Because of this opposition, the members of the enacting unit had begun negotiating for a merger with another mental health unit. The merger was to have taken place at the end of the year. As a result of a favorable response to the agency's disaster related activities by its proposed partner to the merger, a joint decision was made that the merger should be moved ahead

by six months. This initial restructuring was part of a series that enhanced the credibility and status of the enacting unit.

Restructuring: Four Element Form - (D-T-R-A)
Metropolitan Religious Association

Case Description

The disaster event was the catalyst for this instance of restructuring. The director of the association initially offered the resources of its member units to a variety of local and regional organizations. The Red Cross was the first organization to respond to his offer by requesting the development of a food service system. The central office of the association was located in an adjoining county to that of the impacted community. The association had 5 full-time professionals and several hundred volunteers from 15 member churches. Its formally defined regular tasks were as follows: campus ministry, church missions, criminal justice, cable television, political action, mental health, public education, senior citizens programs, hospital referrals, housing, chaplin services, social service programs, tax guidance, and membership advocacy. The association normally maintained numerous contacts with local, regional, and national organizations. During the restructuring and the events which followed, the association was linked with 18 local, 3 state, and 3 national organizations.

The restructuring reported here is judged to be a D-T-R-A form in Kreps' taxonomy. Its score on the derived metric is +4, suggesting that substantive rationality was at work. The restructuring began one hour following impact, with the request by the Red Cross to establish a food service system. The total time of the restructuring took 4 1/2 days

and, once implemented, the food services were provided for approximately two weeks. Elapsed time from catalyst to first element was 1 day-5 hours, from first to second element 3 days, from second to third 4 hours, and from third to fourth 1 hour. Although the food was served at a single site, tasks related to buying and preparing the food were performed at many other (more than 5) locations. This initial restructuring was one of several by the enacting unit. The unit was still involved in disaster related activities at the completion of DRC's study (18 months from the disaster event).

Almost immediately following the disaster, the director of the association told his professional staff to begin offering the assistance of the association--and without specifying any restrictions--to a number of groups and organizations in the impacted community. The following morning the Red Cross made the request for the development of a food services system under association auspices. Speaking on behalf of the association, the director agreed to take on this responsibility. Because the association had never been involved in this sphere of activity before, the formal acceptance of the responsibility involved a restructuring of the association's domain (D). Focused efforts were then made to develop a new task structure related to the planning of nutritious meals, the purchasing, preparation, and serving of food, the maintenance of proper sanitation, the location of facilities, and the mobilization of volunteers from member churches (T). Following the development of a workable set of tasks, the mobilization of the necessary resources to get started took place (R). As stated above, the system was fully operational some 4 1/2 days after the restructuring

began, and was suspended about two weeks later. The archives provide no evidence of either internal or external conflict related to the development or implementation of this food service system. The membership judged the service to be of value and consistent with the goals of the association. The association's work was judged to be of great assistance by other social units.

Case Discussion

In contrast to the second example, the enacting unit made a commitment to provide disaster related services, but not necessarily within the constraints of a previously defined domain. Thus the change of ends--and substantive rationality--was critical for what took place; and all four elements of organization were involved in the restructuring. The first element implicated was domain (D). The director and his staff were innovating, yet within a general value system that supported helping behavior. A strain toward substantive rationality continued with the restructuring of tasks (T). Once collective representations of what was to be done and how were crystalized, means based restructuring took over.

Following the restructuring of ends, the unfolding events give the appearance of inevitability that is consistent with the earlier example of fixed ends and administative rationality. But the unit might not have been able to pull off the reorganizing. For example, members of the association might have rejected the new domain or tasks. Things could have fallen apart at the level of resource mobilization. Or it could have been later determined that the service was not needed. An implied value of Kreps' taxonomy is that it provides a way of describing

failed as well as successful attempts to create (origins) or restructure organization. Moreover, it implies that in some other type of disaster, the food service system might emerge very differently while being no less organized (Kreps, 1985). In this example, the demands of efficiency and effectiveness appeared to be equally well-served. The unit improvised and in an orderly fashion. The example points to an important paradox. The actor is subject of structure just as his response is order driven. Or as Durkheim and Weber might put it, people are creating structure but are impelled by ultimate values. The values which motivate them are external as well as internal (Alexander, 1982).

Multiple Restructurings by a Single Unit

In this section an example of multiple restructurings by a single unit will be described. Following this description two additional tables (Tables 5 and 6) will be presented. The tables will be used to summarize findings on multiple restructurings and the derived temporal (rhythm, periodicity) and spatial measures of form (pattern, uniformity). Table 5 arrays the 57 instances of restructuring by enacting unit. In cases of multiple restructurings by the same unit, the forms of restructuring are arranged in chronological order. Table 6 depicts the 57 instances of restructuring with respect to time lags from catalysts to the first appearing element and any subsequent elements involved in a restructuring.

Multiple Restructuring: A-T-R, A-T-R-D, T-R, T-R-A, R, R-A, D-T-R-A
Enacting Unit: Counseling-Intervention Agency

Case Description

The enacting unit and the initial restructuring are the same as
that described earlier as an example of a three-element form of
restructuring (A-T-R). The description and interpretation of that
restructuring will not be repeated here. Rather, subsequent events will
be described as they unfolded from the completion of the initial
restructuring. Recall that the unit adapted initially by providing a
message service immediately following the event. The service continued
for about two weeks or until telecommunications were restored. The
catalyst for the second restructuring was the result of an issue that
developed very early following the initial restructuring. The resulting
second restructuring is judged to be an A-T-R-D form in the taxonomy.
Its score on the derived metric is -2, indicating a slight strain toward
administrative rationality. The catalyst appeared 20 hours after the
disaster event (6 hours from initial restructuring). The restructuring
began about 7 hours after the catalyst and took about 2 days to
complete. Just as in the case of the first restructuring, unit
activities were dispersed over more than five sites. Elapsed time from
element one to two was about 4 hours; from two to three was close to 8
hours; and from three to four was 1 day.

The catalyst is expressed in the archives as concern by the staff
and volunteers about the adequacy of the messages being transmitted and,
more importantly, their felt need for a broader scope in the agency's
emergency activities. The message service--which had taken about 14
hours to set up--was focused on linking mental health units, with this

agency playing the role of conduit. But as a function of their concerns, the members of the agency began to expand that role within hours. (Note that we are dealing with the immediate emergency period and the enacting unit was located in the heart of the impact area.) Their innovativeness led ultimately to a legitimated emergency communications and coordination domain. Rather than simply receive and transmit messages from mental health units, the staff and volunteers began actively seeking timely information from a variety of groups and organizations on the status of the emergency and pressing needs. Some members began to coordinate meetings, locations, or other activities for many responding individuals, groups, and organizations. In effect, the scope of activities expanded in size, with the unit serving firms, hospitals, public bureaucracies, and social service organizations (A). With the rapid development of these activities a new task structure quickly emerged to monitor, control (and not lose), distribute, and use the many bits of information that were being processed (T). This expanded tasks structure then called for still additional volunteers who were recruited over the next several hours (R). About a day later, the legitimation of the agency's communication and coordination activities was evidenced by the many units working with it (D). The agency maintained this domain for some 14 days (16+ days after the event and the effective end of the immediate emergency period).

The third restructuring is judged to be a T-R form in the taxonomy. Here the metric score is +1, revealing a slight strain toward substantive rationality. The catalyst was concern expressed by the professional staff about the appropriateness of volunteers for handling

the expanded responsibilities of the agency. The concern was evident

some 12 hours following the end of the second restructuring (3 1/2 days

from the disaster event). The volume and diversity of information and

requests for action were quite high (about 1200 calls per day at its

peak). It was stated that while the volunteers were doing a good job,

the staff sought greater continuity by having people who could work

longer hours and who had certified managerial skills. In effect, the

staff redefined respective roles of professional and volunteer during

the emergency--asserting the prerogatives of the former and restricting

those of the latter. The result was a redefinition of tasks to reflect

professional requirements (T). This was accomplished in about 12 hours.

The staff then recruited and hired two additional full-time

professionals (R). The length of and funding for employment were not

clear at the time of hiring. In any case, that part of the

restructuring took about one day. The total time of restructuring was 1

1/2 days (completed 5 1/2 days following impact). Unit activities

continued to be dispersed over more than 5 areas.

The fourth restructuring is judged to be a T-R-A form in the

taxonomy. The derived metric score was -1 indicating a slight strain

toward administrative rationality. The catalyst was an innovative idea

for handling the volume of communications flowing into and out of the

agency. The idea, which was circulating almost immediately following

the hiring of two new professionals (5 1/2 days post-disaster), was a

suggestion to develop a regular community information sheet. Elapsed

time from catalyst to the first appearing element was 12 hours; from

first to second one hour; and from second to third one hour. The total

time of restructuring was therefore 14 hours (some 6 1/2+ days following impact).

The staff had been using volunteers as runners to gather and distribute information materials. Someone (it is not clear who) suggested that it would be helpful if a regular information sheet was developed for the community. The sheet could include information related to community needs and resources. For example, the sheet developed later included the names of stores, other business, and churches that were open, disaster relief sites, emergency loan sites, and mental health assistance sites. The restructuring began with a determination of what would be included on the sheet as well as various job assignments related to its production and distribution (T). Following that, things happened very quickly: with the assignment of staff and volunteers and the purchasing of necessary materials (R); then the actual onset of work related to the community information sheets (A). The agency sustained these activities for 30 days.

The fifth restructuring is judged to be an R form from the taxonomy. Its derived metric score is -3, indicating administrative rationality. The catalyst here was the previously stated hiring of the two full-time professionals (completed some 5 1/2 days post-disaster). The archives indicate that the new employees began working without a specification of length of employment and only the expectation that money would become available. About 12 hours following the completion of the fourth restructuring (7 days post-disaster), the agency received funding authorization from the state to fund the two additional professionals (retroactively) for 30 days (R). Although the archives

are not precise about timing, sometime during the firing-authorization interim, the agency director addressed the problem of funding and negotiated the 30 days additional salaries. The monies from state mental health authorities were then received one week later.

The sixth restructuring is judged to be an R-A form in the taxonomy, thus pointing to administrative rationality on the derived metric (-7). The catalyst for the restructuring was a suggestion by federal authorities that laypersons be trained as para-professionals to assist in aiding disaster victims. The suggestion was made at a meeting 14 days after the disaster event (6 days after completion of the proceeding restructuring). Elapsed time from the catalyst to the restructuring of the first element was 1 day; and from first to second element was 1 hour. Thus the total time of restructuring was slightly more than 1 day. As with all previous restructurings, the activities of the unit were dispersed over more than 5 areas.

This instance of restructuring began when members of the counseling-intervention unit responded favorably to the suggestion by assigning 2 members of its professional staff to train and debrief para-professionals (R). The activities (A) themselves began very quickly but did not disrupt normal routines. The routines themselves were re-emerging as the immediate emergency period was waning. The training and debriefing sessions required no more than one person-day per week of staff time. Unit members were involved in this activity for about three months.

The seventh and final form of restructuring in the series is judged to be a D-T-R-A form in the taxonomy. It receives a score of +4,

indicating a strain toward substantive rationality on the derived metric. The catalyst for this restructuring was criticism of the agency by its local oversight board. Prior to the disaster the oversight board had questioned the adequacy of both the professional and volunteer staff to perform mental health activities. This criticism was sustained over a considerable period of time. While the criticism noticeably subsided following the disaster, it reappeared about 88 days after the event (74 days after the completion of the last restructuring). This time the criticism served as a catalyst for the agency's merger with another local unit--in effect, expediting a process that was already under way. While the agency was still providing services at more than five sites, such services were associated with its routine functions rather than disaster related activities.

Approximately six months prior to the disaster, the agency had begun negoitiations with another local mental health unit in the hope of merging. Some tentative plans had been made, but the proposed date of the merger was over a year away. As a result of its favorable evaluation of the agency's disaster related activities, the leadership of the proposed partner suggested that the merger should be pushed ahead by six months. A formal meeting between the partners to the merger took place one day after the catalyst. During that meeting the general framework under which the new unit would operate was determined (D). Then over a period of about 14-15 days job descriptions and assignments were negotiated and agreed upon (T). Late in the negotiations (last few hours), final agreements were reached on the location of the facility for the merger (the site of the unit being referenced here as

restructuring) and a necessary (slight) reduction of personnel (R). As depicted in the archives, the merger developed without conflict between the merged units and with acceptance of the merger by the oversight board. The new unit began operations about 17 days later. The resulting total time of restructuring was 32 days. The newly created unit was on-going at the end of the DRC study (18 months following the disaster).

<u>Multiple Restructuring Discussion</u>

There were seven restructurings in the example presented above. The sequence of metric scores is as follows: -3, -2, +1, -1, -4, -7, +4. While 5 of the 7 restructurings evidence slight to greater degrees of administrative rationality, the mean score is -1.71. This measure of central tendency is apropos of the greater balancing of administrative and substantive rationality that is revealed by what happened. The pivotal point to recognize is that much of the means-based restructuring that prevailed was impelled by improvised rather than predetermined ends. Thus substantive rationality was relevant at strategic points in a continuing process. Without attention to the details of that process (Collins, 1981; Wallace, 1983), the subtle interplay of action and order would escape detection. Such detection supports the dialectical foundation of actor and unit in structure (Alexander, 1982; Rossi, 1983).

Actor as <u>object</u> of structure was crucial at several points to the enacting unit's rapid and arguably efficient response to pressing needs. Indeed, the absence of administrative rationality could have meant the downfall of the unit. That is to say, the archives suggest that too

much reflection and questioning about either old or new ends would have been maladaptive. But at the same time, the actor as subject of structure was critical for the viability of the unit in both the short- and long-term. In the final restructuring, the unit merged with another. From the perspective of the enacting unit, the restructuring is characterized as D-T-R-A. Paradoxically, death was at the same time birth. The restructuring of the old points to substantive rationality using the metric developed here to capture the maintenance of organization. The birth of the new points to goal oriented rational action using the origins metric developed previously by Kreps (1985). Action and order are mutually constituted in structure regardless of which system state is being referenced.

With respect to derived temporal characteristics of form, the sequence of restructurings in this case (see Table 5) evidences the relative absence of rhythm as expressed by either metric scores or the sequential ordering of the elements. Note that on purely logical grounds, the metric provides for the possibility of both balance between administrative and substantive rationality and rhythm. This empirical example implies an inverse relationship between balance and rhythm. On the other hand, the example suggests that balance and periodicity are perhaps related (see Table 6). Specifically, the evidence of some periodicity in lag times between catalysts and elements in the first six restructurings is a function of the compression of administrative and substantive rationality within the narrow time window of the immediate crisis. The last restructuring (the merger) took much longer. It

Table 5 - Number and Forms of Restructuring
by Enacting Units*

Unit	Forms
1) Community Mental Health Group	R (-4)
2) Local Church	R (-4)
3) Drug Encounter Group	D-R-T-A (+2)
4) Children's Service Group	R (-4)
5) Family Mental Health Unit	R-A (-7)
6) Religious Social Services Group	A-R* (-7)
7) Children's Headstart Program	R (-4)
8) Private Psychiatric Services	A-T (-1)
9) Public School	R (-4)
10) Youth Center	R (-4)
11) Child Counseling Center	R (-4)
12) County Mental Health Association	D-T-R-A, R-A (+4, -7)
13) County Hospital	R, R (-4, -4)
14) County Mental Health Group	D-T-R-A, D-T-R-A (+4, +4)
15) Local Inter-Church Group	R, R (-4, -4)
16) Mental Health Foundation	R, D-T-R-A (-4, +4)
17) Metropolitan Hospital	R, D-R-A-T, R-A (-4, 0, -7)
18) Multiple County Mental Health	R-A, A-R, A* (-7, -7, -4)
19) Adult-Child Guidance Group	T-R-A-D, D-T-R-A, D-R, R, R, (0, +4, +1, -4, -4)
20) Counseling -Intervention Unit:	A-T-R*, A-T-R-D*, T-R*, T-R-A*, R*, R-A*, D-T-R-A* (-3, -2, +1, -1, -4, -7, +4)
21) County Mental Health Board	R, R-D-T-A, R, R, R, R (-4, 0, -4, -4, -4, -4)
22) Multi-Faith Church Group	D-T-R-A*, R-T-A, R-A, T-R-A, A-R, R-T-A, T, R, R-T-A, T-A, T-R-A (+4, -3, -7, -1, -7, -3, +4, -4, -4, -3, +1, -1)

* Indicates restructuring described in text

Table 6 - Instances of Restructuring and Timing
of Elements (Time Expressed in Days)*

Unit Type	Form	Lag 1st Element	Lag 2nd Element	Lag 3rd Element	Lag 4th Element	Total Time of Restructuring
1) Community Mental Health Group:	R	42.50				42.50
2) Local Church:	R	4.50				4.50
3) Drug Encounter Group:	DRTA	.62	.08	.87	.04	1.61
4) Children's Service Group:	R	6.50				6.50
5) Family Mental Health Unit:	RA	4.50	22.00			26.50
6) Religious Social Services Group:	AR*	21.50	37.00			58.50
7) Children's Headstart Program:	R	.67				.67
8) Private Psychiatric Services:	AT	.17	4.00			4.17
9) Public Schools:	R	4.50				4.50
10) Youth Programs:	R	4.50				4.50
11) Child Guidance Center:	R	7.00				7.00
12) County Mental Health Association:	DTRA	4.50	1.00	3.30	2.00	8.80
	RA	.50	1.50			2.00

* Indicates restructuring described in text

Table 6 - Instances of Restructuring and Timing
of Elements (Continued)

Unit Type	Form	Lag 1st Element	Lag 2nd Element	Lag 3rd Element	Lag 4th Element	Total Time of Restructuring
13) County Hospital:	R	.33				.33
	R	.50				.50
14) County Mental Health Group:	DTRA	1.42	.04	.04	2.50	4.00
	DTRA	.12	.04	.04	6.00	6.20
15) Local Inter-Church Group:	R	2.50				2.50
	R	.50				.50
16) Mental Health Foundation:	R	.50				.50
	DTRA	1.00	14.00	.08	16.92	32.00
17) Metropolitan Hospital:	R	.50				.50
	DRAT	1.50	2.42	.04	.04	4.00
	RA	2.50	13.00			15.50
18) Multiple County Mental Health:	RA	4.50	1.00			5.50
	AR	.58	.33			.91
	A*	.58				.58
19) Adult - Child Guidance Center:	TRAD	4.50	1.00	2.00	5.00	12.50
	DTRA	8.00	.50	.46	.04	9.00
	DR	13.00	1.00			14.00
	R	16.00				16.00
	R	48.00				48.00

Table 6 - Instances of Restructuring and Timing of Elements (Continued)

Unit Type	Form	Lag 1st Element	Lag 2nd Element	Lag 3rd Element	Lag 4th Element	Total Time of Restructuring
20) Counseling Intervention Unit:	ATR*	.04	.17	.33		.54
	ATRD*	.29	.16	.33	1.00	1.78
	TR*	.50	1.00			1.50
	TRA*	.50	.04	.04		.58
	R*	.50				.50
	RA*	1.00	.04			1.04
	DTRA*	1.00	14.00	.08	16.92	32.00
21) County Mental Health Board:	R	7.00				7.00
	RDTA	9.00	2.00	.17	.04	11.21
	R	13.50				13.50
	R	1.50				1.50
	R	16.00				16.00
	R	1.00				1.00
	R	63.00				63.00
22) Multiple Faith Church Group:	DTRA*	1.21	3.00	.17	.04	4.42
	RTA	.50	1.00	8.00		9.50
	RA	1.50	.04			1.54
	TRA	.50	.04	2.00		2.54
	AR	.50	.50			1.00
	RTA	.50	.04	1.00		1.54
	T	.50				.50
	R	1.00				1.00
	RTA	.50	.04	.04		.58
	TA	4.63	.04			4.67
	TRA	.50	11.00	70.00		81.50

occurred outside the time window of the immediate emergency period and at a time when routines were being re-established in a less pressured circumstance.

With respect to derived spatial characteristics of form, no summary table is needed for this or, as will be indicated below, the remaining multiple restructurings. The evidence points to both _pattern_ in location of the unit and _uniformity_ in dispersion of the sites of unit activities during restructuring. However, neither finding is a foregone conclusion in the circumstance of disaster. A unit's location can be damaged or destroyed by primary or secondary impacts. And in the case of the merger in this example, the facility of the new unit need not have been that of the counseling agency. Moreover, the ostensible uniformity in the dispersion of activities is, to some degree, a function of the limits of the archival data. In this and the remaining cases, when activities were dispersed over more than 5 sites across multiple restructurings, the data are not fine-tuned enough to determine the outside parameters of the sheer number of sites or whether the sites themselves were constant. Certainly there was a great deal of _uniformity_ from one restructuring to the next, but it was far from absolute.

In summary, the above enactment of multiple restructurings evidences a balancing of administrative and substantive rationality and, by implication, the relevance of efficiency and effectiveness criteria in emergency management. The former is grounded by speed of response. The latter is grounded by innovation in the face of changing circumstances. The case also evidences the lack of rhythm but

periodicity in the face of urgency. Finally, it evidences both pattern and uniformity, although the former was clearly at issue with the last restructuring and the latter is probably overstated because of the limits of the data.

Referring again to Table 5, it arrays all 57 cases by enacting unit and a subsample of 46 cases that were part of multiple restructurings by the same unit. The latter 46 cases are listed in chronological order and by sequence of metric scores. Units 12-16 had two restructurings, 17 and 18 had three, 19 had five, 20 (the previosuly described counseling center) and 21 had 7, and the 22nd had 11 (the 4-element form described earlier was the first of a series). Note that Table 5 does not represent the entire universe of restructurings from the event. It only represents those yielded by the archives. Thus any interpretation is constrained by the limits of the data.

Several of the shorter (3 or less) sequences evidence rhythm as depicted by element arrangment and metric scores (units 13, 14, 15, and 18). But with so few restructurings it is hard to tell what this means. Note that the longer sequences point to similar rhythm at points in the process, but only one case with more than 3 restructurings (unit 21) evidences rhythm overall. Of the five cases that show rhythm (13, 14, 15, 18, 21), all but one (14) point to a clear pattern of administrative rationality. And consistent with the earlier case description of the counseling unit, there is a noticeable absence of rhythm with a greater balance of administrative and substantive rationality. This is evidenced most pointedly by units 12 (metric mean of -1.5), 16 (metric mean of 0), 19 (metric mean of -.6), 20 (metric mean of -1.71), and 22

(metric mean of -1.82).

Table 6 arrays the same 22 enacting units by time lags between catalysts and appearing elements. Consistent with Table 5, the units are listed from single to multiple restructurings in an attempt to identify any periodicity in the multiples. The latter cases begin with unit 12 (a two restructuring sequence). Using unit 12 to illustrate the reading of the table, the time lag between catalyst and initial element is 4.5 days for the first restructuring and .5 days for the second restructuring. Reading to the right, the time lag between the first and second element is 1 day for the first restructuring and 1.5 days for the second restructuring. The element comparison stops at this point because the first restructuring involves all four elements and the second involves only two of them. The total time of restructuring was 8.8 days for the first restructuring and 2 days for the second. Note that the overall correlation between number of elements present and total time of restructuring is virtually zero (.03) for this sample of 57 cases.

What do the data on Table 6 suggest? Although periodicity is irrelevant to single element restructurings, note that 7 of 7 cases point to administrative rationality, but not necessarily to speed of response relative to the event (the initial catalyst). Moreover, two of the remaining four single restructurings also point to administrative rationality but neither speed nor periodicity. The last two cases (D-R-T-A and A-T forms) evidence balance of administrative and substantive rationality, speed in enactment of the first element, and some periodicity for the D-R-T-A case. Taken as a whole, the average

time lag between event and the first restructured element is 8.8 days

for the 11 single restructurings and the average total time of

restructuring is 14.6 days.

Now examine the multiple restructurings to see a couple of patterns

that build on the above findings. The multiple restructurings for the

remaining 11 units evidence both greater speed in the initial

restructuring (mean of 2.5 days for the initial element restructuring

and 4.4 days for the total time of initial restructuring) as well as

balance between administrative and substantive rationality. Two

tentative but important inferences about the timing of disaster response

follow: first, administrative rationality does not necessarily enhance

speed; and second, the longer it takes to restructure initially, the

less likely will there be multiple restructurings.

The other major finding from the table is equally tentative but no

less intriguing. It is highlighted most pointedly by the longer

sequences of restructuring from units 20, 21, and 22. Recall from Table

5 that units 20 and 22 evidence an inverse relationship between balance

of means-ends restructuring and rhythm. Table 6 then evidences what

appears to be a positive relationship between balance and periodicity,

at least until late in the process (as pre-disaster routines are being

re-established). On the other hand, case 21 seems to show an inverse

relationships between administrative rationality and rhythm on the one

hand, and periodicity on the other. The implied contrasts are as

follows: balance equates with speed and periodicity, but not rhythm;

administrative rationality equates with rhythm, but not speed or

periodicity.[4]

The thing to keep in mind here is that response during the immediate emergency period generally calls for speed, flexibility, and control in equal amounts. A balance between administrative and substantive rationality arguably meets this requirement. At the same time, the ways this unfolds are so contingent upon fluid circumstances that they are difficult to predicate as to their precise form from one restructuring to the next (low rhythm). Compare this to normal circumstances. Administrative rationality prevails in the absence of crisis because it increases clarity and predictability of organizational routines. Means are restructured with respect to fixed ends as contingencies come up. Because there is a certain randomness of these contingencies, routine restructurings are positively related with rhythm and inversely related with periodicity.

Multiple restructurings also inform the two derived spatial characteristics of structure. Once again, pattern refers to consistency-inconsistency of unit location across multiple restructurings. Uniformity refers to consistency-inconsistency in the dispersion of unit activities over multiple restructurings. The multiple restructurings by the 11 enacting units evidence substantial degrees of both pattern and uniformity. Only two of the units changed location and then only once. Both enacted three restructurings. These same two units also exhibited some inconsistency in the dispersion of activities. Each showed greater dispersion from first to second restructuring: with one decreasing again in its third restructuring; and the other sustaining more dispersed activities.

The location of a social unit is probably one of its most stable

features because it tends to be a fixed site and not changed without

good reason. Change in the dispersion of unit activities is more

readily accomplished. Still, neither change is particularly noticeable

for this event. In part this is a function of the fact that many of the

enacting units studied were propitiously located relative to impact,

remained relatively free from damage, and had dispersed activities in

pre- as well as post-disaster time periods. It is important to

recognize, however, that timing, location, magnitude, and scope of

impact have important contextual variables for any consideration of

pattern and uniformity. The basic and derived spatial characteristics

therefore should be pursued further because (1) modest variation was

identified in this relatively circumscribed event and (2) there are many

types of hazards that have very different characteristics of impact than

that occurring here.

CONCLUSION

Disasters are useful contexts for studying process because

catalysts for change tend to be pointed. Moreover, the time during

which change unfolds can be measured within a relatively narrow period.

The referent for change in this thesis is restructuring of organization.

Restructuring is examined by using Kreps' structural theory and taxonomy

as a framework for comparative study. The taxonomy points to four

elements as discrete dimensions of structure. Domains and tasks are

interpreted as ends of organization. Their restructuring empirically

grounds substantive rationality. Resources and activities are

interpreted as means of organization. Their restructuring empirically grounds administrative rationality. The case materials describe the content of restructuring during the maintenance state of organization. The derived metric describes the form of restructuring as falling on a continuum of administrative to substantive rationality. The thesis also emphasizes the analytical importance and distinctiveness of temporal and spatial characteristics of restructuring.

Major Findings

The theory and findings presented here suggest that there are many alternative but not an unlimited number of paths through which restructuring can occur. It should not be assumed that any one of the 64 forms is more analytically central than any other. Rather, it should be assumed that all forms are possible and that which forms appear is dependent upon the physical, temporal, and social contexts in which they occur. The majority of the cases documented here involve one (25 of 57) or two (13 of 57) elements; and only means are involved in the vast majority of these cases. This suggests that the degree of restructuring is very much constrained by either pre-existing or emergent ends--and administrative rationality. Substantive rationality is far less in evidence and seems to be associated with more complete (4-element) restructurings (12 of 57 cases). Adaptiveness is certainly evidenced by these cases and it is bounded by established or emergent means. Evidence of a balancing of substantive and administrative rationality is also quite noticeable in restructurings involving two, three, or four elements (32 of 57 cases). In sum, while strains toward either administrative or substantive rationality are documented, so too is a

strain toward a balance between them.

With respect to temporal characteristics, there is no correlation between the degree of restructuring (number of elements restructured) and length of enactment. There is evidence to suggest that the longer to takes to restructure initially, the less likely is there to be more of it. Forms of restructuring evidencing substantive rationality are the most infrequent. Accordingly, there has been reluctance to suggest even tentative interpretations of their temporal features.4 Forms evidencing administrative rationality are the most frequent, tend to show greater rhythm but less periodicity, and do not seem to be related with speed of response. Forms evidencing a balancing of substantive and administrative rationality reveal the absence of rhythm, the presence of speed, and some periodicity. The latter results, at least in part, from the fact that so much happened in a relatively short period of time.

With respect to spatial characteristics, with a few exceptions there was constancy of unit location (pattern) and dispersion of unit activities (uniformity). However, it should be emphasized that pattern is, in no small way, a function of the units selected for study in the original research and the type of event studied. And uniformity is overstated because there was imprecision about the number and specific sites of unit activities. It is felt that there are many insights about basic and derived spatial characteristics of structure waiting to be discovered. It is unfortunate, therefore, that far less progress has been made here in measurement of space as opposed to time.

Final Comments

The emergency period of disaster demands improvised and rapid response with no trade-off between efficiency and effectiveness. The findings suggest that a balancing of administrative and substantive rationality increases the chance for this to occur. Too much administrative rationality and the unit suffers for lack of adaptiveness. Too much substantive rationality and the unit suffers for lack of clarity. The findings suggest also that it is difficult to predict how restructuring occurs because administrative rationality, substantive rationality, order, rhythm, timing, and periodicity are not simply related. The attempt here is to develop detailed descriptions about how these concepts relate, then derive interpretations that can later serve as testable hypotheses.

It must be kept in mind that this study is an initial attempt to capture the dynamics of restructuring with a theory that is itself in a preliminary stage of development. Thus, all findings must be viewed as tentative in nature. But even though the original DRC research was not done with this theory in mind, the archives provide the kind of data base that is essential for theory building. Simply put, little can be done without the details provided by the archives. What is needed at this point is primary data collection on the process of restructuring in different types of disasters. Certainly a much larger sample of multiple restructurings will be needed. And certainly the data production problems for studying process are major. But with the kind of focused design that is now possible, many of these problems can be overcome.

Continuing work with the theory is important for both theoretical and practical reasons. On the applied side, a balancing of administrative and substantive rationality is appropriately viewed as a goal toward which emergency management must strive. Concepts like efficiency and effectiveness will remain elusive. However, this study provides important insights about how they relate. Efficiency seems nicely wedded with a pattern of administrative rationality and rhythm. At the same time there is lack of periodicity because means change only as contingecies appear; and the latter occur in somewhat random fashion. There also may be loss of speed because of structural inertia. Perhaps catalysts do not generate response until they are re-defined with respect to fixed ends. In pure form, administrative rationality arguably threatens the unit. Although more speculative, effectiveness seems nicely wedded with substantive rationality because of higher sensitivity to catalysts for change. The flexibility that is implied seems the perfect antidote to unbridled concerns with efficiency. But in its pure form, the unit arguably lapses into incoherence with substantive rationality.

A balance of administrative and substantive rationality seems the best of all possible worlds. Efficiency as well as effectiveness are enhanced and there is less trade-off between them. The quest for such a balance is a venerable nostrum in the management sciences. But as this theory and research shows, there are costs. In pure form, a balance of administrative and substantive rationality points to a complete transformation--and possibly the demise of the unit. But in that transformation or demise there is continuity between the old and the

new. Research on routine contexts suggests that administrative rationality prevails until such time as a crisis can no longer be overlooked (Starbuck, 1983). Research on disaster contexts--where crises are focused--suggests that the balance between administrative and substantive rationality is fleeting. The paradox of organization in either context is its strength and flimsiness (Collins, 1985). Studies of its basic processes brings this out.

There is an important lesson for applied management strategies. Restructuring cannot be forced into particular forms or patterns. It is a part of a process that has a natural momentum of its own: one that can be explained; but one that is difficult to predict or control. Previous research has shown repeatedly that rapid prosocial action is characteristic of disaster (Quarantelli and Dynes, 1977; Kreps, 1984). What may appear as social disruption is better termed elemental forms of organizing to meet unusual demands. Thus emergency management planning must aim for flexibility. Trying to place restructuring within the confines of too rigid limits may well sacrifice efficiency and effectiveness, and lead to failure.

On the theoretical side, the dialectic of action and order is revealed by what Durkheim might call the becoming of organization. Thus, substantive rationality prevails in the context of established means. Administrative rationality prevails in the context of emergent ends. The actor is both object and subject of structure. The unit is both constraining thing and constructed process. The theoretical goal is to make this dialectic fundamental to both description and explanation of structure. To do so requires an appeal to both

qualitative content and quantitative form of human events. Such a goal is not newly stated here. What is newly stated is an explicit theoretical framework and research strategy for studying structure and process at the same time. Kreps (1985) earlier provided a theoretical framework. This thesis provides a research strategy for putting it to work.

ENDNOTES

1) The distinction between types of rationality informs traditional concerns in the management sciences about efficiency and effectiveness (e.g., Starbuck, 1983). A preoccupation with administrative rationality suggests that things get done more efficiently. Yet, overemphasizing the means of accomplishing defined ends might undermine the unit because of too rigid adherence to domains and tasks as inflexible givens. On the other hand, preoccupation with substantive rationality increases the chance of effective performance if there is a consensus among those who are enacting organization. However, when effectiveness becomes the sole focus of participants, domains and tasks are constantly being assessed and reassessed to the detriment of the unit. Thus as Kreps (1985b) suggests, the trade-off between efficiency and effectiveness must not be allowed to become a zero sum game.

2) The nomenclature of time and space developed here revises somewhat Wallace's (1983) earlier distinctions in order to enhance clarity in presentation of findings from this study. There is no question, however, that his time and space measures are well-represented in the research.

3) For a more detailed description of that program see Taylor, Ross, and Quarantelli, 1976.

4) Maybe an important exception here is that D-T-R-A forms tend to take longer than the remaining 4-element forms of restructuring (mean of 13.7 days for 7 D-T-R-A forms and 6.2 days for 5 remaining 4-element forms). The latter forms evidence a greater balancing of substantive and administrative rationality. In the absence of disaster experience--and in the face of a need for a complete restructuring--perhaps there are modest costs in time with pure forms of substantive rationality. Note also that there is one case of a sequence of two restructurings where both are D-T-R-A (unit 14 on Table 6). The pattern here is one of both rhythm and some periodicity.

APPENDIX

CODE BOOK

<u>ITEM: Variable label</u>   <u>COLUMNS</u>

<u>Case indentification: CASEID</u>   3   (1-3)___

<u>Event number: EVENTN</u>   2   (4-5)___

<u>Event type: EVENTTP</u>   1   (6)___
            1 = earthquake
            2 = tornado
            3 = flood
            4 = hurricane

<u>Type of enacting organization:</u>
<u>ORG-TYP</u>   1   (7)___
            1 = emergency relevant public bureaucracy
            2 = other public bureaucracy
            3 = emergency relevant volunteer agency
            4 = special interest group
            5 = private firms
            6 = emergent groups of individuals
            7 = emergent groups of other groups
                 and organizations
            8 = local military
            9 = religious group
            0 = uncertain
Description:_____

_____
_____
_____

<u>Organization activity type:</u>
<u>ACTN</u>   2   (8-9)___
            1 = hazard-vulnerability analysis
            2 = maintenance of standby human and
                 material resources
            3 = disaster preparedness, planning,
                 and training
            4 = public education
            5 = hazard mitigation-structural
            6 = hazard mitigation- nonstructural
            7 = insurance
            8 = issuance of predictions and
                 warnings
            9 = dissemination of predictions and
                 warnings
           10 = evacuation

```
11 = mobilization of emergency personnel
12 = protective action
13 = search and rescue
14 = medical care
15 = providing victim basic needs
     (problems in living)
16 = damage and needs assessments and
     inventory of available resources
17 = damage control
18 = restoration of essential public
     services
19 = public information
20 = traffic control
21 = law enforcement
22 = local governance
23 = coordination and control (organization
     of emergency personnel and resources)
24 = reconstruction of physical structures
25 = re-establishment of production,
     distribution, and consumption activities
     (economic functioning)
26 = resumption of other social institutions
27 = determination of responsibility and
     legal liability for the event
28 = meeting victim basic needs
29 = other
99 = uncertain
```

Description:_____

_____

_____

_____

Specialized domain type: SDOM1   2 (10-11)___

```
 1 = public education
 2 = mental health delivery
     service
 3 = medical health care
 4 = alcohol abuse services
 5 = drug abuse services
 6 = state hospital aftercare
     programs
 7 = day care service programs
 8 = religious health care
     programs
 9 = child guidance center
10 = suicide crisis center
11 = institutional advocacy
     services
12 = state and county
     hospitals
13 = head start programs
14 = churches
```

```
            15 = health and welfare
                 agencies
            16 = senior citizens groups
            17 = other
            99 = uncertain
```

Tasks description:_____

_____
_____
_____
_____

Resources description:_____

_____
_____
_____
_____

Activities description:_____

_____
_____
_____
_____

Domain implicated: DOMI   1   (12)___

```
        1  = yes
        2  = no
        9  = uncertain
```

Description:_____

_____
_____
_____

Tasks implicated: TASI   1   (13)___

```
        1  = yes
        2  = no
        9  = uncertain
```

Description_____

_____
_____
_____

Resources implicated: RESI   (14)___

```
        1  = yes
        2  = no
        9  = uncertain
```

Description:_____

_____
_____
_____

<u>Activities implicated: ACTI</u>   1 (15)___
   1 = yes
   2 = no
   9 = uncertain
Description:_____

_____
_____
_____

<u>Elapsed time from initiation to</u>
<u>restructuring of element 1: ETR-E1</u>   5 (16-20)___
      number of days-hours
      88888 = non-used element
      99999 = uncertain
Description:_____

_____
_____
_____

<u>Elapsed time of restructuring from element</u>
<u>1 to element 2: ETR-E2</u>   5 (21-25)___
      number of days-hours
      88888 = non-used element
      99999 = uncertain
Description:_____

_____
_____
_____

<u>Elapsed time of restructuring from element</u>
<u>2 to element 3: ETR-E3</u>   5 (26-30)___
      number of days-hours
      88888 = non-used element
      99999 = uncertain
Description:_____

_____
_____
_____

<u>Elapsed time of restructuring from element</u>
<u>3 to element 4: ETR-E4</u>   5 (31-35)___
      number of days-hours
      88888 = non-used element
      99999 = uncertain
Description:_____

_____
_____
_____

<u>Total time of restructuring E1 to end:</u>
<u>TOT-RES</u>   5 (36-40)___
          number of days-hours
          88888 = non-used
          99999 = uncertain
Description:_____

_____
_____
_____

<u>Form of restructuring:</u>
<u>FOR-RES</u>   2 (41-42)___
      1 = d
      2 = t
      3 = r
      4 = a
      5 = dt
      6 = dr
      7 = da
      8 = td
      9 = tr
     10 = ta
     11 = rd
     12 = rt
     13 = ra
     14 = ad
     15 = at
     16 = ar
     17 = dat
     18 = dar
     19 = dtr
     20 = dta
     21 = drt
     22 = dra
     23 = trd
     24 = tra
     25 = tda
     26 = tdr
     27 = tar
     28 = tad
     29 = rda
     30 = rdt
     31 = rat
     32 = rad
     33 = rtd
     34 = rta
     35 = atr
     36 = atd
     37 = art
     38 = ard
     39 = adr
     40 = adt

```
41  = dtra
42  = dtar
43  = drat
44  = drta
45  = datr
46  = dart
47  = trad
48  = trda
49  = tadr
50  = tard
51  = tdra
52  = tdar
53  = radt
54  = ratd
55  = rdta
56  = rdat
57  = rtda
58  = rtad
59  = adtr
60  = adrt
61  = atdr
62  = atrd
63  = ardt
64  = artd
```

Description:_____

_____

_____

_____

_____

Number of social links during
restructuring: SOC-LK   2 (43-44)___
        number of links
        99 = uncertain
Description:_____

_____

_____

_____

Number of social linkages - local:
LLINKS   2 (45-46)___
        number of links
        99 = uncertain
Description:_____

_____

_____

_____

Number of social linkages - county:
CLINKS   2 (47-48)____
               number of links
               99 = uncertain
Description:_____
_____
_____
_____

Number of social linkages - state:
SLINKS   2 (49-50)____
               number of links
               99 = uncertain
Description:_____
_____
_____
_____

Number of social linkages - national:
NLINKS   1   (51)____
               number of links
               9 = uncertain
Description:_____
_____
_____
_____

Size of organization: ORGSZ   (52)____
        1 = 9 or less members
        2 = 10-20 members
        3 = 21-50 members
        4 = 51-100 members
        5 = 101 or more members
        9 = uncertain

Description:_____
_____
_____
_____

Number of subunits in predisaster
organization: PRE-SUB   2 (53-54)____
               number of subunits
               99 = uncertain

Description:_____
_____
_____
_____

<u>Number of ranks in formal hierarchy:</u>
<u>NUM-RKS</u>   1   (55)___

       1 = 3 or fewer ranks in authority
          structure
       2 = 4 or more ranks in authority
          structure
       3 = not applicable
       9 = uncertain

Description:_____

_____
_____
_____

<u>Unit task structure:</u>
<u>UNT-STR</u>   2 (56-57)___

          number of tasks
          99 = uncertain
Description:_____

_____
_____
_____

<u>Unit proximity to impacted area:</u>
<u>UNT-PRO</u>   1   (58)___

       1 = local
       2 = county
       3 = state
       4 = national
       5 = not relevent - emergent unit
       9 = uncertain
Description_____

_____
_____
_____

<u>Locus of pre-disaster activities: LOC-PDA</u>   1   (59)___

       1 = local
       2 = county
       3 = state
       4 = national
       5 = not relevent - emergent unit
       9 = uncertain
Description:_____

_____
_____
_____

Extent of unit disaster experience:
UNT-EXP   1   (60)___
        1 = no experience
        2 = limited experience
        3 = moderate experience
        4 = extensive experience
        9 = uncertain
Description:_____

_____
_____
_____

Unit pre-planning: UNT-PLN   1   (61)___
        1 = written program - regularly
            updated
        2 = written plan - filed
        3 = no written plan
        9 = uncertain
Description:_____

_____
_____
_____

Dispersion of focal unit activities-
pre-disaster: DIS-PRE   1   (62)___
        1 = concentrated in one area
        2 = 2 to 4 areas
        3 = 5 or more areas
        9 = uncertain
Description:_____

_____
_____
_____

Dispersion of focal unit activities-
post-disaster: DIS-POS   1   (63)___
        1 = concentrated in one area
        2 = 2 to 4 areas
        3 = 5 or more areas
        9 = uncertain
Description:_____

_____
_____
_____

Initiation of unit disaster response:
UNT-IDR   1   (64)___
        1 = self-contained
        2 = boundary spanning local
        3 = boundary spanning state
        4 = boundary spanning national
        5 = boundary spanning (mixed state

and local)
6 = boundary spanning (mixed local
    and national)
7 = boundary spanning (mixed state
    and national)
8 = boundary spanning (mixed local,
    state, and national)
9 = uncertain

Description:_____

_____

_____

_____

<u>Focus of domain</u>   (65)___
<u>at restructuring</u>: DIS-LOC
        1 = municipality proper
        2 = county proper
        3 = mixed municipality and
            county
        9 = uncertain
Description:_____

_____

_____

_____

<u>Reason for suspension of disaster relevent</u>
<u>activity</u>: REA-SUS   1   (66)___
        1 = demand met, activities terminated
        2 = loss or depletion of human or material
            resources
        3 = absorbtion of domain and tasks by
            another entity
        4 = task structure breaks down
        9 = uncertain
Description_____

_____

_____

_____

<u>Total time of disaster response</u>: TTRES   5 (67-71)___
            number of days-hours
            88888 = non-used
            99999 = uncertain
Description:_____

_____

_____

_____

Response continuing at point of final
interview: RES-CON   1   (72)___
       1 = yes
       2 = no
       9 = uncertain
Description:_____
_____
_____
_____

Restructuring beneficial to focal unit:
RES-BEN   (73)___
       1 = yes
       2 = no
       9 = uncertain
Description:_____
_____
_____
_____

Restructuring related to focal units
specialized domain: RES-REL   1   (74)___
       1 = related
       2 = unrelated
       3 = partially related
       9 = uncertain
Description:_____
_____
_____
_____

Unit identification: UNID   2 (75-76)___
       1 = Health Foundation
       2 = County United Health Foundation
       3 = Child Counseling Center
       4 = Metropolitan Hospital
       5 = Drug Encounter Group
       6 = County Mental Health Clinic
       7 = Board of Education
       8 = Community Mental Health Group
       9 = County Welfare Department
      10 = Local Church
      11 = Public School
      12 = Multiple County Mental Health
          Association

```
13 = Children's Head Start Program
14 = County Health Department
15 = County Hospital
16 = County Mental Health Group
17 = Multi-faith Church Group
18 = Adult-Child Guidance Center
19 = County Health Commission
20 = County Health And Welfare
     Planning Council
21 = College Health Care Center,
22 = Children's Service Group
23 = Community Mental Health Center
24 = Religious Social Services
     Group
25 = Family Mental Health Unit
26 = County Mental Health
     Association
27 = County Hospital
28 = Senior Citizens Group
29 = County Welfare Department
30 = Senior Citizens Council
31 = State Hospital
32 = Counseling-Intervention Unit
33 = County Mental Health Board
34 = Local Inter-Church Group
35 = Disaster Outreach Group
40 = Other
```
Description:_____

_____
_____
_____

<u>Elements symmetrically related: ELE-SYM</u>   2   (77)___

```
          1 = No - one element form
          2 = Yes - two element symmetrical
          3 = No - two element non-symmetrical
          4 = No - three element non-tendency
          5 = Yes - symmetrical tendency
          6 = Yes - four element symmetrical
          7 = No - four element non-symmetrical
          9 = Uncertain
```
Description:_____

_____
_____
_____

Logical metric - weighted first element:

BMET   2 (78-79)___

        1 = -5
        2 = -4
        3 = -3
        4 = -2
        5 = -1
        6 = 0
        7 = +1
        8 = +2
        9 = +3
       10 = +4
       11 = +5

Description:_____

_____

_____

_____

Logical metric - non weighted first element:

JMET   (80)___

        1 = -2
        2 = -1
        3 = 0
        4 = +1
        5 = +2

Description:_____

_____

_____

_____

Logical metric - origins:

GMET   1   (81)___

        1 = -3
        2 = -2
        3 = -1
        4 = 0
        5 = +1
        6 = +2
        7 = +3

Description:_____

_____

_____

_____

Conflict within focal unit:
CONFIN   1   (82)___
         0 = benign
         1 = conflictual
         9 = uncertain
Description:_____

_____
_____
_____

Conflict outside focal unit:
CONFOUT   (83)___
         0 = benign
         1 = conflictual
         9 = uncertain
Description:_____

_____
_____
_____

Total time of focal units involvment
in disaster related activities: TTINVO   5 (84-85)___
         number of days-hours
         88888 = non-used
         99999 = uncertain
Description:_____

_____
_____
_____

Agent for restructuring of focal unit:
AGENT   1 (86)___
         1 = internal
         2 = external
         9 = uncertain
Description:_____

_____
_____
_____

Source for restructuring: SOURCE   1 (87)___
         1 = collective
         2 = individual
         9 = uncertain
Description:_____

_____
_____
_____

Derived logical metric: METRIC   2 (88-89)___

       1 = -7
       2 = -6
       3 = -5
       4 = -4
       5 = -3
       6 = -2
       7 = -1
       8 = 0
       9 = +1
      10 = +2
      11 = +3
      12 = +4
      13 = +5
      14 = +6
      15 = +7

Description:_____

_____
_____
_____

Catalyst for restructuring: CATA   1 (90)___

      1 = element related contingency
      2 = disaster event
      3 = competition
      4 = cooperation
      9 = uncetain

Description:_____

_____
_____
_____

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