# Social Structure

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# Disaster and the Social Order

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How are disaster and social structure related? This question is the theoretical challenge facing students of disaster (Quarantelli and Dynes 1977; Kreps 1984b). Easily stated, it is not simply answered or even considered. In what follows I try to be precise about what is involved with this question, offer some guidelines for dealing with it, and suggest some answers. Problems of taxonomy are central. While definitions of things are arbitrary, taxonomies must yield both conception *and* measurement. This chapter, and much of the research reported in this book, emphasizes the need for taxonomies that link properties of social structure and disaster.

There has been much debate about when historical happenings are disasters (Wright and Rossi 1981a). Still, no one denies that they do take place. Building on past efforts to define and compare disasters (Fritz 1961; Barton 1969; Dynes 1970; Perry 1982; Kreps 1984b), the chapter proceeds by proposing four core properties. Disasters are events that can be designated in time and space. These events have impacts on social units. The social units enact responses that are related to these impacts. With the intent of describing and explaining social structure—or the forms of human association (Wolff 1950 on Simmel)—sociologists emphasize study of social units and responses. But in so doing we must be sensitive to major issues of classifying the events chosen for research. These issues, and guidelines for comparing events, are discussed next in terms of physical and temporal dimensions of impact.

The major thrust of the chapter then follows. Problems of defining and classifying social units and responses are highlighted and a strategy for solving them is offered. Building what amounts to a core species concept of social structure (McKelvey 1982),[1] and drawing on Weber's distinction between individual and general ideal types (Weber 1968; Kalberg 1980; Col-

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lins 1980; Saunders 1981; Levine 1981; S. Turner 1983; Alexander 1983),[2] the specific solution proposed is a sixty-four-cell taxonomy of the responses of social units to the threat or occurrence of disaster. The taxonomy highlights a dialectical relationship between social action and social order as each is represented by the process of organization (Giddens 1979, 1982; Alexander 1982a). This dialectical relationship is expressed by a metric that merges qualitative descriptions of the content of social structure with quantitative depictions of its forms. Brief comments on remaining classification problems and broader epistemological issues confronting studies of social structure conclude the chapter.

## The Phenomenon of Disaster

Just like social structure, disaster is a vague term that has defied simple interpretation. Most social scientists refer to actual or possible disasters (hazards) in terms of physical impacts of or problems caused by unplanned and socially disruptive events (Fritz 1961; Barton 1969; Dynes 1970). Their most visible features are that they do physical and social harm, that they strike suddenly (or at least are ultimately represented as acute), and that something can be done about them either before or after they happen (Perrow 1984). Depending on the hazard selected (the list is large and increasing) and the social unit defined as threatened (literally from the single household to the entire planet), the very survival of that unit may be important (Erikson 1976; Burton, Kates, and White 1978; Perry 1982). So studying disasters, or trying to do something about them, involves examining social structure as both cause and effect of events that threaten human populations.

A modest revision of Fritz's earlier (1961) definition points to the mutual relationship between disaster and social structure. Thus, disasters are *events in which societies or their larger subunits (e.g., communities, regions) incur physical damages and losses and/or disruption of their routine functioning. Both the causes and effects of these events are related to the social structures and processes of societies or their subunits.* So defined, the term *disaster* serves as a sensitizing concept (Dubin 1978)—one, like social structure and many other global concepts used in science, that calls attention to some "thing" while being less than precise about what it is. The value of such concepts depends on whether implied properties can be isolated and examined.

The argument here is that the above definition points to four core properties. Disasters are (1) events that can be observed in time and space. These events have (2) impacts on (3) social units. The social units enact (4) responses that are related to these impacts. The events include a long list of

natural, technological, ...
circumstances. The impacts ...
curred by a social unit and the disruption of ... functioning. While the social unit can be as small as a household, individual and social impacts are expressed at higher levels of aggregation. The responses are related to the new demands created by an actual or possible event and its impacts, and the continuing requirements of sustaining a viable social system.[3]

The taxonomy problem facing disaster research relates to the above four properties. While the identification and measurement of property spaces are not obvious, they may be specified as physical, temporal, or social. For example, events can be characterized by their energy release (physical), their periodicity (temporal), or their formal declaration as a disaster (social). Impacts can be distinguished in terms of their damage to the natural or man-made environment (physical), duration (temporal), and degree of disruption (social). Social units may vary by location (physical), time of origin relative to the occurrence of the event (temporal), and societal level (social). Responses may involve structural engineering (physical), be relevant before, during, or after the impacts are felt (temporal), and, as will be shown below, result from a variety of forms of human association (social).

With four basic properties and three general dimensions for locating property spaces, the classification problems are enormous but not overwhelming. Social scientists emphasize research on social units and responses. This chapter offers a taxonomic strategy for doing so. But there are equally important problems of classifying the very events that are selected for study. I will try to show below that much closure in classifying social units and responses can be achieved within a necessarily open-ended approach to classifying events. The events themselves can be compared with reference to physical and temporal dimensions of their impacts.

## The Classification of Events and Impacts

Exhaustiveness in classifying disasters is unattainable, yet that is not very important. It is also unlikely that mutual exclusiveness of events will ever be achieved in narrow physical terms—e.g., floods in terms of maximum height reached by rivers and streams, droughts in terms of moisture deficiency, earthquakes in terms of level on the Richter scale, tornadoes in terms of swath length and wind velocity, or nuclear detonations in terms of energy release and altitude. Although destructive potential is high for all of these hazards, the preconditions and results of these physical happenings are the important matters to the social scientist. Comparisons of any

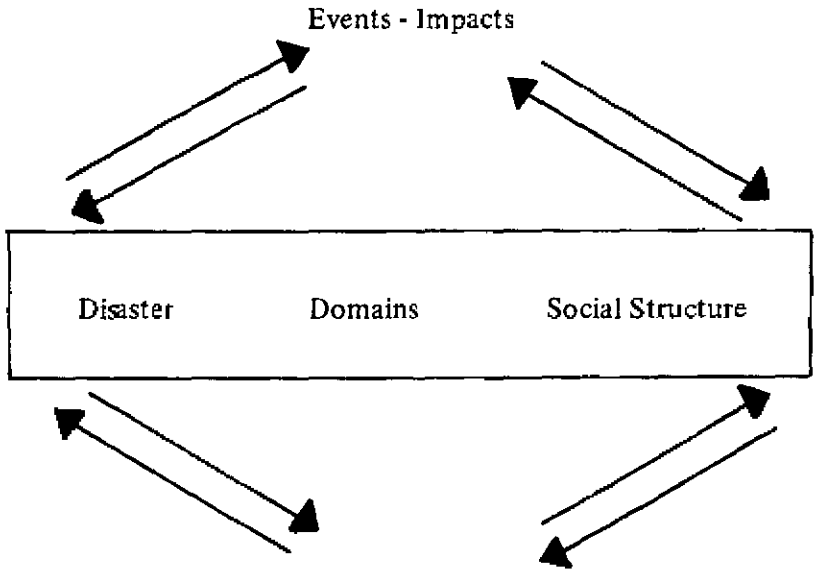
selected hazards can be made in terms of their physical and temporal features and how both are translated as socially constructed disaster events.

Current and past disaster studies have focused primarily on natural and to some extent technological hazards. There also has been at last some attention to civil strife and war (Fritz 1961; Mileti, Drabek, and Haas 1975; Quarantelli and Dynes 1977; Burton, Kates, and White 1978; Mileti 1980; Kreps 1984b). The property spaces relevant to an interpretation of impacts for such hazards include at least the following: (1) magnitude of impact, (2) scope of impact, (3) length of forewarning, and (4) duration of impact. As noted above, each has physical, temporal, and social dimensions that can serve as either independent or dependent variables.[4] For taxonomic purposes, I suggest that social scientists focus on physical and temporal similarities and differences of impacts in comparing whatever events are of interest. This is because their social dimensions are better captured by taxonomies of social units and responses.

As expressed graphically in figure 1.1, an important bridging concept in

Figure 1.1

Relationship between
Social Structure and Disaster



this regard is domain. Defined with greater precision below, domains represent actual or threatened physical and temporal impacts as legitimated spheres of collective action. For example, floods have greater scope of impact than tornadoes, while the latter have less forewarning. The two types of events can be compared in terms of these characteristics of impacts. At the same time, domains such as damage control or warning translate these physical and temporal features as the responses of social units. The enclosed rectangle on figure 1.1 depicts the relationship of social structure and disaster through domain performance. The continuous arrows reflect the fact that disaster and social structure are at once antecedent and consequent of each other. Pre- and postimpact domains capture the life history of disaster as historical happening. As presented below, responses to disasters reflect alternative forms of association. These forms are enacted by different types of social units. Taxonomies that capture forms of association, domains, and enacting units are therefore needed. The work reported on in the next section of this chapter has addressed the first of these needs most thoroughly via a search for instances of organization. As defined and observed, social structure is both thing (unit) and process (response).

## The Classification of Social Units and Responses

I take as given the fact that the basic subject matter of sociology is social structure, or the forms of human association (Wolff 1950 on Simmel). To speak of social structure is to assume that these forms exist (Mayhew 1980, 1981, 1982). To define social structure is to identify what they are and to locate them empirically. The crux of our work with archival materials on mostly postimpact responses of social units involves, in effect, a search for social structure. What is a response? What is a social unit? When do the responses of social units reflect organization? What distinguishes organization from other types of social structure? The following example from our work with disaster archives reveals some of the subtleties involved in addressing these basic questions. It is but one of 423 instances of organization from fifteen disaster events (earthquakes, floods, hurricanes, tornadoes) that we have found thus far. As defined below, the parenthetical letters depict four basic structural elements of organization: activities ($A$), human and material resources ($R$), tasks ($T$), and domains ($D$). We argue that the four elements are individually necessary and collectively sufficient for organization to exist. This means that each one represents a unique expression of social structure; that their mutual copresence points to the existence of organization; and that no specific pattern of their origins is necessarily more frequent, important, or effective. Simply put, the four elements and their sequencing are the foundation of a theory of disaster,

social structure, and organization. Their interpretation will be developed gradually, using this and two other examples from an expanding data file.

*Four-Element Form: A, A-R, A-R-T, A-R-T-D*

> An organization of search and rescue emerges following an earthquake. The event takes place without forewarning, is regional in scope, destructive in magnitude, and its prompt and secondary physical impacts are over within minutes to several hours. The central business district and a large residential area of a major city are seriously damaged. Immediately following impact, many individuals who happen to be in or near these areas engage in joint actions related to search and rescue of victims (*A*ctivities). A few of these early responders have search-and-rescue training. Within an hour many search-and-rescue teams converge on the impacted areas. Both formal and informal, they come from city agencies, other municipalities, the military, and several voluntary search-and-rescue groups (*A*ctivities-*R*esources). A task structure emerges among some of these disparate groups within several hours after impact, with prominent roles played by members of a mountain rescue group and members of an improvised "damage control" group (*A*ctivities-*R*esources-*T*asks). The legitimacy of an integrated search-and-rescue operation is not officially recognized by city government officials until about twelve hours after impact (*A*ctivities-*R*esources-*T*asks-*D*omain). By then it is operating, now formally, out of the city's public safety building. Formal search and rescue actions continue for another twenty-four to thirty hours.

This description suggests an origins of organization where activities (*A*) are followed by the mobilization of key resources (*A-R*), which then leads to the establishment of a set of tasks (*A-R-T*), and finally to the declaration of a domain that is recognized and legitimated within the impacted community (*A-R-T-D*). The enactment of search and rescue involves four different forms of association (one, two, three, and four elements present), only the last of which is organization. As described, social structure appears as action-driven because things happen before there are collective representations of what is going on. However, the search and rescue could have been accomplished in a different way. The direct obverse would be a pattern where domain declaration and definition of tasks precede resources and activities, revealing a pattern of *D*, *D-T*, *D-T-R*, and *D-T-R-A*. The search and rescue would then appear as order-driven because collective representations of what is to occur would constrain social action.

There are also many other possible patterns falling between *D-T-R-A* and *A-R-T-D*. Consider two other examples from our data file. Once

again, each indicates when a particular element of social structure is judged to have been established. Notice how the patterning of the elements vary in the two examples. The first instance of organization (evacuation domain) points to improvisation by an existing social unit. The second (care of fatalities domain), just like the earlier search-and-rescue example, depicts what is sometimes termed collective behavior or emergent organization (R. Turner 1964; Turner and Killian 1972; Weller and Quarantelli 1973; Marx and Wood 1975; Jenkins 1983). In reviewing the approach, the reader must keep in mind that even though most (all but fifty-two) of the 423 instances of organization found were enacted by established social units of various types (they existed prior to the event), presence is not assumed for purposes of studying the process of organization.[5]

*Four-Element Form: A, A-R, A-R-D, A-R-D-T*

Flood waters rise over a period of several days in the impacted 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 police department activity. 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*ctivities). 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 citizens volunteer to do so as well. By now, the majority of police personnel have become involved because they are available, in close proximity, and know where to take evacuees (*A*ctivities-*R*esources). The following morning local government leaders declare the downtown evacuation the responsibility of the police department (*A*ctivities-*R*esources-*D*omain). 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 that involves location, notification, dispatching and refueling of boats, assignment of police personnel to all boats, and coordination of water and ground transportation to move evacuees to shelters

(*Activities-Resources-Domain-Tasks*). About five thousand people are evacuated during the next three to four days. The operation is maintained by the police department until the demand is met.

*Four-Element Form: D, D-R, D-R-A, 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. He usually simply signs autopsies after they are completed by hospital pathologists. After the tornado, representatives for the only local 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 Young Men's Christian Association for the morgue. The YMCA director accedes to the request (*Domain*). 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 (*Domain-Resources*). 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 (*Domain-Resources-Activities*). The need for "organization" is expressed by the key participants. The identified and unidentified dead are physically separated, with the two pathologists attending to them. The licensed embalmer and marine recruiter take on paperwork 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 (*Domain-Resources-Activities-Tasks*). The morgue closes about twenty-four to thirty hours after it opens.

By reconstructing what is happening through sustained spadework with the archives, equally interesting but different forms of association have been found for a variety of disaster-relevant domains. Our strategy is to address organization as thing (unit) and process (response). By thing we mean an entity with identifiable properties, which are the above four structural elements. By process we mean a patterning of these elements as they individually and collectively represent the origins of organization. For ease of communication, the parenthetical letters serve as a structural code. Domains (*D*) and tasks (*T*) are the ends of organization, while resources (*R*) and activities (*A*) are its means (Merton 1957a). Further details on these elements follow:

*Domains (D)*

*Domains are bounded spheres of human activity that point to the existence of a unit and what it does.* As things, domains are collectively represented in the communications of those included in these spheres of activity and those who interact with them at the boundaries of the unit (Levine and White 1961; Thompson 1967; Haas and Drabek 1973). Domains are objective (external) and in the Durkheimian sense real and constraining. They are also subjective (internal) and in the Weberian sense individually created and legitimated (Durkheim 1938; Weber 1968; Giddens 1976, 1979; Alexander 1982a, 1982b, 1983). A unit specification does not imply anything else about the existence of organization. As an individually necessary condition, then, domain points to a form of association that is distinct from all others. Its establishment may take place at any point in the origins of organization.

*Tasks (T)*

*Tasks are specifications of a division of labor for the enactment of human activity.* As things, they independently define the unit quality of social action. While domain represents social structure as open system that is legitimated internally *and* externally, tasks point to it as closed system that is structured from within (Thompson 1967; Perrow 1967). As part of a process, tasks are a unique expression of structure. They may come to exist at any point in the origins of organization.

*Human and Material Resources (R)*

*Resources are the material technologies and subjective attributes of human populations.* Their presence in a process as things comes to be defined with reference to the unit quality of social structure, but they may be mobilized before or following the emergence of domains and tasks. Resources are both static and dynamic: they are static because their relevance as a part of organization is conditioned by the external reality of domains and tasks; they are dynamic because domains and tasks are the social constructions of human beings.

*Activities (A)*

*Activities are the interdependent actions of human populations that at once establish and are conditioned by social structure.* As things, activities are the remaining social means of organization that, although analytically dis-

tinct relate symmetrically with its interpretation as thing (unit) and process (response). Activities are no more or less conceptually important than the remaining three elements. Certainly *D*, *T*, *R*, and *A* all are grounded in the actor, as reality and creator of the unit. However, each is equally grounded in the unit, as reality and constraining force (Warriner 1956, 1979; Giddens 1979; Alexander 1982a). In other words, the fact that people enact activities, are themselves resources, and communicate (formally and informally) domains and tasks does not mean that structure reduces to action as opposed to order. Quite the contrary, it is equally feasible to predicate structure in terms of an order referent (Warriner 1956; Rossi 1983).

Assuming that structure exists and can be defined, perhaps the two most basic questions of structural inquiry are how is social structure created and how is it maintained. The former implies a concern with social action and the latter with social order. Human responses to disaster highlight the idea that social action and social order are dialectically related. By that we mean that they are both autonomous but can be reduced to one another. A venerable argument in sociology, this pivotal point will become spelled out as a matter of both logic and evidence in this and the remaining chapters of Part 1. As the discussion unfolds, the reader should remain sensitive to the fact that what is sought is an explicandum (structure) that is neither psychologically nor sociologically reductionist (DiTomaso 1982).

Consider again the above three examples. Interpreted as action, what is evidenced are people making choices and, in effect, creating social structure when routines are disrupted. However, the critical importance of already existing structure for what is happening cannot be denied (e.g., for the police personnel, hospital pathologists, funeral directors, ministers, search-and-rescue teams). The people involved are not only making social roles, they are ritualizing ones already in place (R. Turner 1978; Stryker 1980; Collins 1981a). That is to say, social action is both cause and effect of social order. Interpreted as social order, what is evidenced are social units of various types. Some exist prior to the event, and their involvement in it is expected, while others are new. In either case, these social units can be characterized on their own terms (Mayhew 1980, 1981, 1982) and what they do, in effect, involves maintaining social structure when it is threatened. But although these units can be seen as fixed entities or things, they are undeniably transforming as the result of the actions of human beings. That is to say, social order is both cause and effect of social action.

Such is the dialectic of social structure. The quest must be to exploit it as a tool of substantive research. How? The initial and key question becomes as follows: if action (and the actor) and order (and the unit) are autonomous yet related, what then is being observed in descriptions of collective life? The answer here is that the paradox of creating and maintaining collective life compels a methodology in which structure is conceived and per-

ceived as spatially and temporally bounded events (Bhaskar 1979; Collins 1981a). These events reflect alternative forms of association (Wolff 1950 on Simmel). It is these forms that are observed and must be explained. They are chosen for analysis because social structure should not be reduced to either social action or social order when defining it. Once these forms have been identified and located, however, action and order perspectives can be used additively in trying to explain them (Dubin 1978).

By specifying what organization is as a matter of presence and absence of the above elements, it becomes possible to distinguish between it and other types of social structure. To repeat, it is argued that the four elements are individually necessary and collectively sufficient for organization to exist. Three important ideas about the forms of association in disaster can be derived logically and each is represented in table 1.1. First, a total of sixty-four forms of association depicting one, two, three, and four structural

Table 1.1
Taxonomy of Forms of Association

| Organizational Form | Marginal | Three-Element Forms | Two-Element Forms | One-Element Forms |
|---|---|---|---|---|
| D-T-R-A | 167 | D-T-R | D-T | D |
| D-T-A-R | 5 | D-T-A | D-R | T |
| D-R-A-T | 27 | D-R-A | D-A | R |
| D-R-T-A | 53 | D-R-T | T-R | A |
| D-A-T-R | 2 | D-A-T | *T-A | |
| D-A-R-T | 1 | D-A-R | T-D | |
| T-R-A-D | 21 | T-R-A | R-A | |
| T-R-D-A | 4 | T-R-D | R-D | |
| T-A-D-R | * | *T-A-D | R-T | |
| T-A-R-D | * | *T-A-R | A-D | |
| T-D-R-A | 1 | T-D-R | A-T | |
| T-D-A-R | * | *T-D-A | A-R | |
| R-A-D-T | 15 | R-A-D | | |
| R-A-T-D | 13 | R-A-T | | |
| R-D-T-A | 67 | R-D-T | | |
| R-D-A-T | 12 | R-D-A | | |
| R-T-D-A | 4 | R-T-D | | |
| R-T-A-D | 13 | R-T-A | | |
| A-D-T-R | 1 | A-D-T | | |
| A-D-R-T | 1 | A-D-R | | |
| A-T-D-R | 2 | A-T-D | | |
| A-T-R-D | 4 | A-T-R | | |
| A-R-D-T | 5 | A-R-D | | |
| A-R-T-D | 5 | A-R-T | | |
| Total | 423 | | | |

*Indicates forms not located with reference to origins of organization

Table 1.3
Social Order-Social Action Metric for Total Sample

| Organizational Form | Logical Metric | Number of Forms | Number of Units: Total Sample |
|---|---|---|---|
| D-T-R-A | 6 (+3) | (1) | 167 (167) |
| D-T-A-R | 5 (+2) | (3) | 5 |
| D-R-T-A | | | 53 (59) |
| T-D-R-A | | | 1 |
| D-R-A-T | 4 (+1) | (5) | 27 |
| D-A-T-R | | | 2 |
| T-R-D-A | | | 4 (100) |
| T-D-A-R | | | – |
| R-D-T-A | | | 67 |
| D-A-R-T | 3 (0) | (6) | 1 |
| T-R-A-D | | | 21 |
| T-A-D-R | | | – (39) |
| R-D-A-T | | | 12 |
| R-T-D-A | | | 4 |
| A-D-T-R | | | 1 |
| T-A-R-D | 2 (−1) | (5) | – |
| R-A-D-T | | | 15 |
| R-T-A-D | | | 13 (31) |
| A-D-R-T | | | 1 |
| A-T-D-R | | | 2 |
| R-A-T-D | 1 (−2) | (3) | 13 |
| A-T-R-D | | | 4 (22) |
| A-R-D-T | | | 5 |
| A-R-T-D | 0 (−3) | (1) | 5 (5) |
| Total | | (24) | 423 (423) |

This can be done in the following way. At the social order end of the continuum, *D* precedes *T*, *R*, and *A* (3 points); *T* precedes *R* and *A* (2 points); and *R* precedes *A* (1 point). Given one point for each conforming transitivity (3 + 2 + 1), *D-T-R-A* receives a score of six and *A-R-T-D* receives a score of zero. Beginning at the social action end would simply reverse the scores, but not change the distribution in any way. Thus *D-R-T-A*, for example, receives a score of five when starting from the social order end and one when starting from social action. With *D-T-R-A*, social ends predicate social means. With *A-R-T-D*, the obverse is the case. The twenty-two forms between *D-T-R-A* and *A-R-T-D*, and the remaining forty nonorganizational forms subsumed by them, suggest varying degrees of continuity and discontinuity between the ends and means of collective life (Merton 1957a).

Only the six forms at the midpoint of the distribution have the same score regardless of whether the referent is social order or social action. A midpoint form such as *R-T-D-A*, for example, receives a score of 3: from the social order end of the continuum because *R* precedes *A* (1 point), *T* precedes *A* (1 point), and *D* precedes *A* (1 point); and from the social action end of the continuum because *R* precedes *T* (1 point), *R* precedes *D* (1 point), and *T* precedes *D* (1 point). The score is 3 because no other transitivity is consistent with "perfect" social order or "perfect" social action. By subtracting a constant 3 from each derived level of social order or social action, the resulting metric is +3 to −3 with a 0 midpoint. This simply highlights where the tension or perhaps balance between social order and social action is greatest. In sum, the metric is the bridge between Weber's two notions of ideal types. It is also a logical and empirical expression of the autonomy and unity of social action and social order.

The twenty-four forms are arrayed on tables 1.2 and 1.3 as discrete types and as they are converted to the above metric. Notice in particular the spread of the cases over the entire range of the continuum. The distribution suggests that neither order nor action dominates at the origins of organization. Recall also that, given the dialectic of social structure, actor and unit perspectives are equally relevant to both ends of the continuum. Thus there is no reason to argue that a unit referent is more important at the *D-T-R-A* end and an actor referent more important at the *A-R-T-D* end. The above three examples, and a host of others, do not support such a conclusion. By not assuming organization and by examining social process the mutual shaping of the ends and means of collective life is more sharply revealed.

The four elements, the forms of association derived from them, the case materials that locate these forms, and the metric that represents the dialectic of social structure are parts of a strategy that defines organization as what is to be explained. In working with qualitative data, quantitative thresholds for the existence (presence-absence) of each element are not yet established. It is uncertain what these thresholds are. We suspect that every threshold that is actor-based will ultimately reduce to a unit threshold, and vice versa. In our judgment, such symmetry is compelled by the necessary (indeed inevitable) balancing of psychological and sociological reductionism. For now, we rely on case materials to communicate to the reader judgments about the existence of forms of association that are, in the Weberian sense, plausible (S. Turner 1983).

## Related Problems of Classifying Domains and Social Units

This section is brief but important. It is brief because only modest headway has been made in considering related problems of classifying domains and enacting units and important because resolving these problems can lead to

better explanations of disasters. As noted earlier, analysis of disaster and social structure suggests that actual or threatened impacts translate as domains of collective action that are enacted as alternative forms of association. This translation is part and parcel of the social construction of a set of historical circumstances as hazard or disaster event. Relatively little is known about the enactment, or lack thereof, of preimpact domains. Most postdisaster domains, such as those reported on here, are impelled by physical impacts and social disruption.

In either case, locating instances of organization is critically tied to the identification of domains. We show the 423 cases in terms of a classification of such domains in table 1.4. The majority relate to the emergency period, which is dictated by the original data collection strategy of the Disaster

Table 1.4
Types of Disaster Domains of Enacting Units

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

Research Center. Whether before or after impact, it must be remembered that many domains are not predesignated and quite often more than one unit is independently engaged in the same domain. Thus, boundary specification is a continuing methodological concern because discrete instances of organization are linked to broader networks of social units, some of which are doing the same thing.

Although beyond the scope of this research, it is possible that there is a hierarchy of units involved in the performance of any domain and that this hierarchy can be represented as forms of association. That is to say, where social units are engaged in the same domain, perhaps the systemic character of ecological organization is being revealed by relationships among them (Hawley 1950). With reliance on Darwinian theory, the object of inquiry in human ecology is the population of social units rather than individual members (McKelvey 1982; Carrol 1984). The idea of population reflects species similarity and survivorship in an environment of competing populations of social units. But regardless of whether the object of inquiry is the population or single member, the separation of similar from dissimilar types is analytically critical. As employed here, domain relates nicely to the ecological concept of niche. Although it is difficult to know whether domain boundaries are obvious or subtle (narrow or wide niches), I suggest that sociologists look for populations of social units that carve out the same or related domains and examine and compare domain enactments as alternative forms of association.

In any case, what has been developed here amounts to a classification of domains by time phases of disaster (before, during, and after), which relates to the identification of discrete responses and enacting units. The enacting units are treated as single members rather than populations or purposes of analysis. Neither time phases nor impacts have precise boundaries. On the other hand, domains are treated in the theory–and communicated by those involved in disaster responses–as general rather than specific representations of spheres of activity. It was quite appropriate, therefore, to develop the kind of broad list of domains presented in table 1.4. Still, we remain very sensitive to the fact that a definitive taxonomy of disaster domains has not been developed.

Notwithstanding the intricacies of classifying domains, the enacting units can be identified and compared in various other ways. Depending on the characteristics of events and impacts, the location and relevance of these units may be local, regional, national, or international. Hence classifications of instances of organization by form of association, domain, and other characteristics of the enacting units are all relevant analytically. In table 1.5 is a classification of the social units that enacted the 423 responses, one that is consistent with conventional categories of organizations. The predominance of disaster-relevant bureaucracies (police and fire

Table 1.5
Types of Enacting Units

| Enacting Unit Type | Frequency | Percentage |
|---|---|---|
| Emergency relevant public bureaucracy | 215 | 50.8 |
| Other public bureaucracy | 22 | 5.2 |
| Emergency relevant voluntary agency | 40 | 9.5 |
| Special interest group | 27 | 6.4 |
| Private firm | 9 | 2.1 |
| Emergent unit of individuals | 28 | 6.6 |
| Emergent unit of groups and organizations | 24 | 5.7 |
| Military unit | 37 | 8.7 |
| Mass media | 21 | 5.0 |
| Total | 423 | 100.0 |

departments, hospitals, departments of public works) and voluntary agencies points, once again, to the emphasis of the original studies. There is no question of a resulting gross under representation of most of the remaining types of social units.

The classification of social units in table 1.5 is not elaborate. However, a definitive taxonomy does not exist and there has been little impetus for its construction and some disagreement about whether taxonomy is even relevant for studies of organization (Carrol 1984). We hope that the core species concept presented here can inform numerical taxonomies of social units. The variables that heretofore have been used in taxonomic work can readily be interpreted as properties of domains, tasks, resources, or activities (McKelvey 1982; Stapleton, Aday, and Ito 1982). Still, the more pivotal need is a taxonomy that is at once structural and processual. That is what we have attempted with a taxonomy of forms of association.

## Discussion

Perhaps the most difficult aspect of the approach is the establishment of the existence and patterning of the four elements through qualitative research. The threshold judgments for the existence of the elements are pointed. However, the criteria that underlie them are, at best, implicit except to say that dichotomous choices (presence-absence) are being made. The built-in counterfactuals in the taxonomy are therefore crucial because they provide the basis of any future work on reliability But as implied earlier, questions about measurement error must be placed in a broader epistemological context (Tudor 1982; Halfpenny 1982).

Reliability would be enhanced through use of the theory by a community of scholars. We hope that happens. For now, some quantitative sociolo-

gists may bemoan the seemingly imprecise measurement of what is to be explained. At the same time, we suspect it will be difficult for them to deny the relevance of the research for defining collective life, how it is created, and how it is maintained. With regard to defining structure, many of the implied variables subsumed by $D$, $T$, $R$, and $A$ (e.g., size, complexity, formalization) are measured repeatedly in, for example, the organizational literature (Nystrom and Starbuck 1981a, 1981b; Hall 1982). More often than not, related studies focus on the static side of social units and structure is measured with an apparent assumption of face validity. While that assumption is suspect, we can foresee use of this core species concept as a taxonomic tool that enhances mainstream structuralism (Blau 1975; Blau and Merton 1981).[6]

Such work is important and should be encouraged in every possible way. However, the greater need is studies of process. Here the proposed taxonomy and metric can serve as explicanda for the life history of organization (Gamson 1975; Skocpol 1979; Kimberly and Miles 1980; Starbuck 1983; Faia 1986). The potential power of the theory is its dialectical expression of subject matter—one that opens the door to both structuralist (order) and individualist (action) paradigms (Mayhew 1980, 1981). In other words, one can examine organization (or any other form of association) from either paradigm with the full recognition that the paradox of each is the conduit to the other.

It might be argued by structuralists and individualists alike that validity will necessarily be fleeting in this effort because form of association (as opposed to actor or unit) is chosen as the object of inquiry. That is to say, once both psychological and sociological reductionism have been rejected, social science is reduced to a search for transcendental reality (Bhaskar 1979). That is true if the issue is to be couched only in metatheoretical terms. However, we think the matter is better termed as working at the margins of substantive knowledge about social structure. In that regard, sociologists can take comfort from studies of physical structure. The search for essences and conditions in natural science reduces structure to thought experiments and a pure mathematics of form. Part and parcel to the search, however, is an appeal to rules. These rules predicate an observable and link observer with observed.

Whether physical or social structure, the appeal to rules of observation and measurement is central. The predicated observable here is the form of association. The sixty-four forms that have been identified are grounded in the content of historical events. The social order-social action metric provides rules that link form with content. What remains is the problem of figuring out how the observer mediates formal reality and observed action and order (Giddens 1976; Rossi 1983). It is in this epistemological context that we approach problems of reliability and validity of measurement.

What is offered, then, is but a modest step toward a disaster sociology that is in keeping with the requirements of science.

The first requirement of science is a framework that is descriptive of events (Wallace 1971; Collins 1981a; Alexander 1982a; Wallace 1983). Description inevitably leads to classification and the problem of taxonomy. The forms of association outlined above, and the case materials that empirically locate them, are parts of a classification strategy. The second requirement is a framework that is explanatory. The metric presented in this chapter is one possible link between the taxonomy, which is content based and qualitative and theoretical models, which are form based and quantitative. The development of such models is emphasized in other chapters of part 1. The modeling is in every important sense dependent on the conception of social structure and disaster presented here.

## Notes

1. Working from evolutionary theory in biology, McKelvey (1982) argues for the necessity of a core species concept in studies of human collectivities. By core species concept he means a basic unit of analysis. Although the approach presented here is developmental rather than evolutionary (Carrol 1984), a core species concept is relevant for both approaches to social structure. Of the several criteria for a species concept that McKelvey proposes, the most important for our purposes is the requirement of sharp discontinuities among the objects being classified. However, such discontinuities do not preclude polythetic types that are based on properties of the core species concept (Bailey 1973).

2. In Weberian methodology, individual ideal types are historical and grounded in numerous empirical instances. General ideal types are transhistorical and establish the elements from which individual ideal types are composed. Weberian examples of the former are bureaucracy and capitalism; and of the latter are the four modes of social action (traditional, affectual, instrumentally rational, and value-rational).

3. In effect, disaster and social structure have been defined in terms of each other. The scientific challenge is to break out of this intentional tautology by making choices in given studies and theoretical models about which of the four properties are to be independent and dependent variables. In the present study, the events serve as catalysts, impacts are independent variables in subsequent modeling (not reported here), and the responses of social units represent what is to be explained.

4. Length of forewarning, for example, refers to the amount of time between the identification of hazardous conditions and the actual onset of effect in particular locations. To some extent the warning period is a function of the effectiveness of warning systems. At the same time it is clear that hazards differ in terms of the extent to which they permit warning. Similarly, the magnitude, scope, and duration of impact are represented by physical effects and social disruption but, in so doing, give expression to how social units and processes increase or decrease vulnerability to hazardous conditions in the first place.

5. It must be remembered that disasters are not routine events for local com-

those directly im-
the event. Thus we decided to use the event as a social catalyst. The rationale is similar to that found in chemistry. In other words, disaster is a catalyst whose presence can be used to examine the process of organization. The importance of

. structure can be developed by increas-
. of elements included The result here was four because we felt that together they efficiently capture organization in its most elemental sense, imply most of the variables that social scientists associate with the concept, and relate it to conventional notions of what organization is about (Giddens 1976; McKelvey 1982).