PRELIMINARY PAPER #133

LESSONS LEARNED FROM RESEARCH ON
DISASTERS*

E. L. Quarantelli
Disaster Research Center
University of Delaware

1988

Historical Background

Systematic studies on disasters in the social and behavioral sciences are essentially a post World War II phenomena. It is true that the earliest scientific work in the area was a Ph.D. in sociology done at Columbia University on the social change associated with a massive explosion in Halifax harbor in 1917 (Prince, 1920), and that there were some isolated writings on the topic in the next two decades (Carr, 1932; Kutak, 1938; Sorokin, 1942). However, these undertakings did not lead to any sustained or continuous research. But in the first few years of the early 1950s, a handful of sociologists in the United States initiated field research on the reactions of people especially in the emergency time periods of community disasters generated by agents ranging from tornadoes and earthquakes to explosions and plane crashes into residential areas (for a discussion of the historical context and development, see Quarantelli, 1986a; 1988c). These few scientific pioneers from sociology had very little idea that they were setting in motion the development of a new area for study, the considerable enterprise that exists today under the label of social science disaster research.

For since those early studies, research has also been conducted especially by geographers (see e.g., Burton and Kates, 1964; White, 1974); political scientists (see e.g., Abney and Hill, 1966; Davis and Seitz, 1982); anthropologists (see e.g., Anderson, 1968; Oliver-Smith, 1977); and psychologists (see, e.g., Zarle, Hartsough and Ottinger, 1974; Janis and Mann, 1977; Zarle, Hartsough and Ottinger, 1974). However, all disciplines with interest in human and group behavior now have at least a critical mass of researchers doing work on some aspects of disasters. Every methodological tool available ranging from laboratory experiments and simulations (Drabek, 1970) to historical analyses (Barkun, 1974) has by now been used, although field work continues to be the hallmark of studies in the area (for a discussion of the range see Mileti, 1987). In time too, the other now accepted phases of disasters, namely mitigation/prevention, preparedness, and recovery became the object of attention also. There similarly has been the carrying out of studies at all social levels from individuals through households, to groups and organizations, and from communities through societies (see Mileti, Drabek and Haas, 1975; Drabek, 1986, for a presentation of research findings categorized according to these different dimensions).

Also, what was once an almost exclusive American concern is currently the focus of systematic research in at least three dozen countries around the world including developing countries such as Mexico, India, Brazil, China and Yugoslavia, and developed countries such as Australia (see e.g., Wettenhall, 1979), Italy (see e.g., Quarantelli and Pelanda, 1988), Japan (see e.g., Okabe and Hirose, 1985), Canada (see e.g., Scanlon and Padgham, 1980), and Belgium (see e.g., Lechat, 1976). There currently exists professional association of disaster researchers (e.g. the International Research Committee on Disasters; the Association of International Disaster Experts; the International Panel for Risk Reduction in Hazard Prone Areas; the Section on Emergency Management of the American Society for Public

Administration). Workers in the area hold frequent national and inter-
national meetings, and they have their own professional journals (e.g., The
International Journal of Mass Emergencies and Disasters, The Industrial
Crisis Quarterly, Disaster Management, Journal of Hazardous Materials,
Disaster Medicine, and Disasters: The Journal of Disaster Studies and
Management), newsletters (e.g., Unscheduled Events, The Natural Hazards
Observer, Disaster Preparedness in the Americas, The Hazard Monthly, The
Emergency Management Dispatch), and publication outlets (e.g., the series
put out by the Natural Hazards Information and Applications Center at the
University of Colorado; by the Disaster Research Center at the University
of Delaware; by the Mass Emergencies Program at the Institute of Inter-
national Sociology at Gorizia, Italy; by the Relief and Development
Institute in London, Great Britain; and by the Center for Research on the
Epidemiology of Disasters at the University of Louvain in Brussels,
Belgium).

By almost any criteria that could be used, research on the human and social
aspects of disasters is now a well established and institutionalized field.
In less than 35 years a substantial research enterprise has developed. The
validity of taking a social scientific perspective on disasters is present-
ly accepted without challenge. This contrasts with the situation of the
pioneer sociologists who were often uncertain if they were posing the right
questions and who frequently were surprised by the answers they obtained in
their work (see Quarantelli, 1986; for an assessment of current disaster
studies in sociology, see Dynes, DeMarchi and Pelanda, 1987).

<center>Sources Of Data</center>

Quantity and Quality of Studies Undertaken.

How much has been done and how good is it? This is a legitimate question
about any field of study. There are differences of opinion among disaster
researchers on the answer that could be given. But we have to give a
rather positive answer to the question if we are going to suggest that
there are lessons to be derived from disaster research. Since our position
is that an affirmative answer is very possible, let us explain our thinking
on this matter.

It seems to be an occupational characteristic of most areas of study for
the researchers involved to bemoan the research undertaken in their area.
This certainly seems to be true of many disaster researchers. In conferen-
ces and in publications and literature reviews, it can be safely predicted
that it will often be stated that the existing research is both quantita-
tively and qualitatively limited at best, if not poor (e.g., through the
years, see Barton, 1969:54-62; Torry, 1979; and for German criticisms in
particular see Schorr, 1987).

It is our opinion that such a judgement depends on what is being used as a
point for evaluation. Measured against some ideal standard the work done
so far in the disaster area might not be evaluated too highly. From a
quantitative point of view it could be argued that we possibly have not yet
reached the total of a thousand systematic social science studies of

<center>2</center>

different natural and technological disasters (events, not total number of studies). This certainly is a low number relative to the totality of such events which have occurred. It also might be said that on many important questions we have only a handful of studies of any kind (e.g., there are only about four studies on the handling of the dead; for the last see Blanshan and Quarantelli, 1981). Qualitatively, it might be questioned if there is any fully established proposition at all in the disaster area, let alone laws or fundamental models. In fact, even the conceptualization of disasters has recently surfaced again as a serious unresolved problem in the field (Hewitt, 1983; Kreps, 1985; Britton, 1986; Quarantelli, 1987; and Drabek, 1988).

On the other hand, and it is our position, a much more positive evaluation of what has been achieved can be reached. Three decades ago when systematic disaster research had started to develop, it was possible to cite only very few studies in the area, using the word study rather loosely. Currently, hundreds of pieces of research have been undertaken, thousands if the term research is used broadly. Present day lists of unstudied or poorly studied topics are almost always refinements of major questions which have at least been explored in some fashion; it is now all but impossible to do any work on any aspect in the disaster area that someone had not already partly examined (for the situation about a decade ago, see Taylor, 1978). If the criteria used are the number of works done in the last several decades and the range of topics looked into, then obviously we have come a very long way (for the situation even a decade ago see Quarantelli and Dynes, 1977).

Judgments of qualitative merit can be made using a variety of criteria. However, again, if we use as a basis of evaluation not some ideal norm, but a real world feature such as the quality of the research work done in non-disaster areas of study, disaster research would not rank that badly. In terms of such criteria as intellectual sophistication, theoretical frameworks, explanatory schemes and/or sets of empirical generalizations, the field of disaster research compares well with studies done in major subspecialities of the discipline with which we are most familiar, that is sociology; the two subareas we have in mind are collective behavior/ social movements (Aguirre and Quarantelli, 1983), and the sociology of mass communication (Wright, 1986).

At any rate, our point is that a case can be made for both the relative if not absolute quantity and quality of the research generally undertaken in the disaster area. Instead of glibly accepting the downplaying of what is generally known, we should ask what evaluative criteria are being used, and in particular, how disaster studies stack up to what has been done in comparable non-disaster areas. Occupational self-flagellation about poor research in a given area undoubtedly serves some psychological and social functions for the operation of professional communities, but this should not be confused with a correct assessment of the situation.

Which Kinds of Disasters in What Societies.

In talking of disasters, what is the referent? We leave aside here the earlier mentioned intellectual dispute about the concept as such. Instead what we are interested in here is what has actually been studied under the name or label of "disaster". While not everyone has proceeded in the same way, the vast majority of self designated disaster researchers have dealt with human and social aspects associated with natural hazardous agents (such as hurricanes, floods, volcanic eruptions, tornadoes, earthquakes, tsunami, and blizzards) and with risk producing technological agents (such as explosions, fires, chemical and nuclear plant accidents, electric and energy system failures, biological poisonings, and large scale transportation wrecks and structural collapses). While there are exceptions (e.g., Baum, Fleming and Davidson, 1983) most disaster researchers have not found it particularly useful for study purposes to draw a distinction between so-called Acts of God and Acts of Men and Women, a point we shall discuss later in a different context.

It is noticeable that the occasions associated with the above happenings are all relatively sudden in appearance and generally have a fairly definable locale or area of impact. Far less studied by social and behavioral scientists have been the usually more diffuse in time and space kinds of hazardous situations. Examples would be famines, droughts, health epidemics, coastal erosions and subsidence, slow chemical poisonings (for instance, by asbestos), radiation contaminations (for instance, by radon), and climatological pollutions (for instance, acid rain). Slow on-set threats pose both theoretical and methodological problems and issues not encountered in quick on-set dangers, although some such as famines, droughts and health epidemics would probably be readily accepted as "disasters" by the great majority of researchers in the area. Nonetheless, the research base and literature we draw from is primarily about sudden type disasters.
(for an inventory of disaster field studies in the social and behavioral sciences up to 1980, see Quarantelli, 1984b).

Even more excluded by those doing studies in the field are conflict types of occasions, that is, where one or more parties in the situation are consciously and deliberately trying to inflict damage, destruction and/or disruption on some of the population involved. Thus, disaster researchers on the whole have not taken as part of their immediate subject matter such situations as wars, riots and civil disturbances, terrorist attacks and hostage takings, product tampering and sabotage, and pogroms and massacres (but see Kreps, 1984, for the opposite view). We as well as others do see conflict occasions as one kind of collective stress situation (as discussed in Barton, 1970), and as such there are certain common elements shared with disasters--which are essentially consensus kinds of crises--but nevertheless the differences are far more important than the similarities (see the contrast in Quarantelli and Dynes, 1970 and Dynes and Quarantelli, 1973).

Now, not only have disaster studies generally encompassed only certain social phenomena, but they have been primarily conducted in particular places. While disaster studies are currently being undertaken in most

4

countries around the world, the majority of research findings obtained in the last three decades are drawn from a much narrower base. Most of the work has been done in highly developed and industrialized and urbanized societies, and within that the majority of the studies have been done in the United States. It is an open question about the degree to which the research results obtained in one social system are applicable to other systems, and also how findings from developed societies can be generalized to developing societies (for a discussion of this matter, see Quarantelli, 1987b).

General Themes

Out of the extensive research literature we have pulled out ten general themes--broad generalizations which are at least rooted in a minimum body of empirical findings. Three generalizations each are discussed for individual behavior, organizational behavior, and community behavior; one generalization is given about societal behavior. For heuristic purposes, within each set of the first three we look at what can be said about the behavior in the pre-impact phase, the emergency time period, and the post-impact phase of disasters.

We have deliberately chosen three different levels of behavior besides the individual one to emphasize a simple but very important point. Most Americans have a very nominalistic view of social reality, seeing it as the totality of subordinate parts. Thus, groups are sometime viewed simply as the aggregate of the activities of individual members. Many social and behavioral scientists also think in such terms. But our view is different. We take instead a standard sociological perspective that assumes social phenomena at higher levels have characteristics that are not reducible to the sum of the parts at lower levels. For example, the division of labor which exists in a crowd or its shape and duration can not be ascertained by looking only at the characteristics of individual group members or their actions. Therefore, if we are to draw lessons from disaster research, it is important to keep in mind that many of these will be beyond the level of individual behavior. Thus, some aspects of risk communication are more meaningfully approached at the organizational, community, and societal levels.

Individual behavior.

1. It is very difficult to get individuals to be self interested much less concerned about disasters before they happen.

The great majority of people are oriented to the "here and now". As such, the idea of a possible disaster in the future in which they will be directly involved is seem as so remote, unlikely and uncertain that the threat does not enter into consciousness, or if it does, is usually quickly dismissed. Human beings are very unlikely to be engaged by something they do not see as personally involving themselves (or what they value such as their family), which is not immediately present, and which is not certain to occur. The ordinary individual is preoccupied with day-to-day specific problems of living, and is not concerned with remote, abstract, rare,

5

statistical possibilities (for a review of the relevant literature see, Drabek, 1986:320-331). Of course, the actual very low probability nature of disasters for individual actors strongly reinforces this orientation; in this sense the behavior is correctly based on a common sense calculus.

Moreover, even when in certain localities there is a recognition and awareness of a potential threat (e.g., as a result of living near an earthquake fault or a hazardous waste site), citizens see disaster planning as primarily a governmental responsibility. This obligation of the state tends to be seen more in moral than legal terms. To a considerable extent, the passive attitude and expectation that public agencies ought to be taking the lead is indicated by the fact that extremely few persons undertake any kind of specific disaster preparedness in their own house- holds or at their places of work (Saarinen, 1982). Given that relatively few people take precautions against fires in their own homes, it is not surprising that even fewer take any steps with regard to preparing for a collective crisis, that is, a community disaster which may or may not involve them.

There are two major exceptions to the above. First, in localities which repeatedly experience sudden disaster threats or impacts, an agent specific disaster subculture may develop (e.g., for riverine floods or for hur- ricanes—see Moore, 1964). In such a setting, many residents will not only be aware of the danger but will have taken preparatory actions (e.g.,having built a tornado shelter) and/or will know ahead of time what to do or not to do (e.g., not running out of doors during an earthquake). Of course, not all inhabitants even in a disaster subculture area will have been socialized into taking the appropriate behavior. Furthermore, what is important here is not primarily the personal experience of a previous disaster, but rather the development of a shared or collective definition and perception of the situation, namely, a subculture. In fact, inhabi- tants of localities that have disaster subcultures need not have had direct involvement in the earlier occasion—they will learn about the relevance of a specific disaster agent subculture in the same way they learn about other important aspects of their community. Actually even repeated experiences per se of a disaster agent does not automatically generate a disaster subculture among the population of an area; other facilitating conditions are also necessary (Wenger, 1978).

Then there is the phenomena of emergent citizen groups organized around the possible threat or actual impact of a disaster. This, as a recent Disaster Research Center study found, is a relatively new phenomena in American society (Quarantelli, 1985b; 1988a). If people come to define a serious, likely, and probable threat in their immediate neighborhood, and if they judge the local authorities as illegitimately dismissing the concern of residents over the danger, citizen groups may emerge. These groups, only a small fraction of whom are successful in any way, often try to pressure governmental entities to do something about the specific threat. On occasion, this involves attempting to get laws, ordinances or regulations passed to prevent or to prepare for the threat. These informal citizen groups may also at times try to prepare the local population for a possible disaster from the particular danger involved, although it is not very easy

to get people involved (for difficulties in the development of emergent citizen groups concerned with possible earthquakes, see Quarantelli, 1983b). But to the extent such groups are successful, and a few do sometime succeed in a localized area, the awareness and preparation for specific disaster agents may increase substantially in certain neighborhoods of a community.

It should be noted that both exceptions we have noted—the disaster subcultures and the emergent citizen groups—are collective entities, not aggregations of isolated individuals. This is important because mass public educational campaigns aimed at changing individual behavior do not have much of a success record. The research picture in the disaster area about educational efforts aimed at individual persons is also not very encouraging (see Drabek, 1986:334-336); often relatively few people are reached and even fewer learn much. Perhaps a general lesson here for improving risk communication to persons is that the groups of which they are a part rather than individuals per se ought to be the prime focus of the effort. (As we noted earlier, given the nominalistic bias that permeates American society, this requires overcoming the difficulty of understanding that a group, as a collective entity, is not simply the aggregation of the characteristics of the individual members).

2. When disasters do occur, individuals react very well.

One of the most outstanding characteristic of people caught in disasters is that they actively seek relevant information and attempt to do what they can to deal with the exigencies presented by the emergency. The threat of a disaster soon to happen or its actual impact does not paralyze those affected. Passivity in the face of danger is almost nonexistent, and the nearer the threat is perceived to be or the more there have been life disrupting problems to be solved as a result of an impact, the more active persons will be in responding. (see Barton, 1970; Dynes, 1974; Dynes, Quarantelli and Kreps, 1981; Drabek, 1986, for summaries of the research literature).

During and immediately after a sudden impact disaster, individuals tend to think of the event as something centered around their immediate surroundings, and to underestimate therefore the scope and destructiveness of some kinds of disasters. This results in considerable variability in the initial behavior of victims as they enact their usual social roles as worker, family member, friend, official, etc. At the individual and small group level, the behavior is organized, meaningful and goal oriented, although to outsider observers it incorrectly appears as chaotic, confused and random. For example, the bulk of the search and rescue is quickly initiated by survivors. Typically this informal action, sometime undertaken by small ad hoc groupings, attempts to establish the whereabouts and status of most of those in the searched neighborhoods, locates the injured and frequently gets them transported for medical treatment. Concurrently, other survivors will be attempting to find out if relatives and friends in other localities are safe, while still others will go to places where they think they will be needed, and others will voluntarily undertake a variety of emergency tasks from unofficially clearing streets of debris and

directing traffic to informally providing shelter, food, and clothing to their neighbors in immediate need of such goods. Survivors do so much prior to and separate from actions and directions of officials that it sometimes leads emergency agency personnel to mischaracterize the activities as confused and non-goal directed.

Victims not only act positively, but they also show little deviant behavior. The belief that disasters generate much personal deviancy is very widespread and deeply rooted in the public at large, community officials, and to some extent, even among the personnel of emergency organizations and disaster victims themselves (Wenger, James and Faupel, 1985). Several themes predominate in this kind of thinking. Thus, it is assumed that disasters generate irrational panic and unleash anti-social behavior. Stories and rumors about such behavior are almost universal after a disaster, but actual instances are often nonexistent, low in relative frequency when they do occur, and surface only if there are particular set of circumstances which tend to be rare in community type disasters. However, these myths about individual disaster behavior are important because they affect what both citizens and officials often expect and accordingly influence other behaviors (e.g., a reluctance to evacuate because of concern over possible looting, or not issuing warnings because of the belief that panic flight may occur).

Disaster victims do not generally act irrationally, certainly no more so and even less likely than in everyday activities (if by rationality is meant considering options in a crisis situation and/or using appropriate means given certain desired ends, Quarantelli, 1981). People who perceive themselves in great danger, if they have any contact with social reality, will feel greatly afraid. But even great fear does not automatically translate into hysterical paralysis, wild flight, or other dysfunctional actions—three frequent referents when the term "panic" is used. Panic flight additionally endangering self and/or others can and does occur in some collective stress situations, but even isolated episodes of such behavior are very rare in community disasters. This is because the typical disaster setting lacks the specific conditions necessary for panic flight: namely a confined space, an immediate high particular risk to self, a perception that escape from entrapment is still a possibility, and a sense of social isolation. There are more likely to be present in an isolated hotel or theater fire than in a community wide disaster.

Instead of wild flight away from a disaster site, there is far more likely to be convergence on places where emergency tasks are being carried out. Motivations to help others, rather than narrow self preservation or help, predominate in community disasters. Now, especially to inexperienced officials and journalists, disasters are seen as offering maximum opportunities for the surfacing of anti-social behavior. It is speculated and written that survivors are the easy target for looting and other forms of criminal activity. The imagery is that as Mr. Hyde takes over from Dr. Jekyll at the time of the emergency, property crime rates will rise, violent crimes will increase, and exploitative behavior will spread.

However, the research evidence lends almost no support to these notions. (Dynes, Quarantelli and Kreps, 1981). For example, many stories of looting (stealing of goods) will circulate and almost everyone will hear some of them. But looting at the time of an emergency is not a serious problem; often, apparently not even a single case occurs. Such instances as do occur are not numerous, usually involve articles of little value (which may have been picked up by sightseers), and seem to be committed by outsiders to the community—at times by members of security forces brought in to prevent looting! Overall, prosocial rather than antisocial behavior is a dominant characteristic of the emergency time period of a disaster. Such crime as occurs will be far below that which would normally happen on an everyday basis, the mythological belief to the contrary. If the height of a disaster unleashes anything, it is less criminality than altruism. As noted earlier, survivors quickly move in very positive ways to do what they can for themselves and for others.

We have noted some of the major myths of how victims act during disasters to make the point that people can and do react very well to extreme stress situations. They are neither so fragile that they will panic in the face of danger, nor so poorly socialized that they will become anti-social when threatened in a disaster. One possible lesson from this research observation is that human beings will almost certainly deal well with communications about even very serious risks far better than they are often assumed to be able to handle. People may be frightened upon being told of dangers, but a concern that this will lead to undesirable behavior at the time of an emergency is not warranted by the research evidence from community disasters. It should be assumed that individuals will rise to the occasion.

3. While the experience of a disaster is a memorable one, and there are differential short run effects, there does not appear to be too many lasting behavioral consequences.

The traumatic stress of a disaster experience is widely thought to have both short- and long-run negative consequences for the mental health of the survivors. Thus, community disasters supposedly drive some people "crazy", psychologically scar numerous others so they cannot function normally in the post-impact period, and leave in their wake many seriously emotionally disturbed victims. These pathological psychological behaviors are presumably manifested by almost all or a majority of victims, and may last indefinitely unless treatment is obtained.

However, this image of community disasters as inevitably creating many and significant mental health problems is another one of the prevailing major myths of disaster behavior (for an analysis of the different points of view on this issue, see Quarantelli, 1985a). Thus, community disasters at least very rarely if ever produce any new psychoses or severe mental illnesses (particularly if measured against the degree of mental illness and psychological problems that can be found everyday in the typical American community). But it does appear such occasions can generate many surface psychological reactions such as sleeplessness, loss of appetite, anxiety and irritability. These symptoms tend to be subclinical, short lived and self remitting. While in some disasters most of the victims exhibit many

9

such characteristics, more typical is considerable variation in the number of survivors who exhibit them, and the kinds of post-impact psychological reactions that appear. More important, even those showing these kinds of reactions are rarely incapacitated in terms of their normal everyday behaviors.

With respect to nonpathological consequences, there seems to be differential effects at least in the short run. While "experience increases hazard perception" (Drabek, 1986:327), for some this results in more sensitivity to future danger cues; but for others, it appears instead to create a sense of future invulnerability. The latter seems to be similar to a phenomena noted with respect to individuals who survived a "near miss" during World War II air raids or rocket attacks; they too generally felt less vulnerable to later threats (Janis, 1951). Development of more positive self images as a result of having reacted well to the crisis has been reported by researchers who looked for other than just negative effects (see, e.g. Taylor, 1977). Behaviorally too, there are differential effects. For example, it has been noted that direct victim family members compared to nonvictim family members not only feel closer to one another than before the disaster, but they also come to interact more with one another than with others outside of the family (Drabek and Key, 1984). On the other hand, it has been reported that there were a variety of behavioral and psychological negative effects in the long run aftermath of a very atypical and rare catastrophic occasion, namely the Buffalo Creek flood disaster (Erikson, 1976).

However, while a disaster experience is not forgotten, in the long run, it seems to fade somewhat in salience and importance. It is especially difficult to see from the research done many   behavioral consequences that can be attributed to having experienced a disaster. In some ways, this is to be expected. People have many experiences in their lives, and while a disaster may be a dramatic incident, it often is simply that—a one time memorable event embedded in very many other important family and work experiences of a more continuous nature that will necessarily have greater impact on the person. In that context, it is not surprising that we were told that one study found far   more serious psychological and behavioral consequences from an economic recession than it did from even the extended stress created by the Three Mile Island nuclear plant accident in the same general area.

Nevertheless, there is a possible lesson here also for improving risk communications with individuals. It does appear that in the immediate aftermath of a disaster, certain segments of the population would appear to be relatively open to learning more about the threat they had recently undergone. There would seem to be a window of opportunity available.

Organizational behavior.

4. To the extent organizations plan for disasters—and few do—they often fail to recognize the crucial difference between emergencies and disasters.

The great majority of public or private organizations in a community do no planning at all for disasters. The exceptions are certain normally crisis oriented groups such as police and fire departments or hospitals and the utilities. However, such plans as are made are often rather limited. For one, there is a tendency to plan for disastrous happenings that will occur to others—most hospital planning for instance ignores the possibility that the hospital itself may be directly impacted by a disaster (Quarantelli, 1983a). This is even truer true of mass media groups (see Wenger, Quarantelli and Dynes, forthcoming). Second, such planning as is undertaken frequently reflects a technological bias; emphasis is on having certain kinds of equipment and facilities such as multiple radios or a computer run emergency operating center (EOC), rather than developing the appropriate social organization to use the technology. In fact, as technological types of disasters have loomed larger in American society, the more there has spread the notion that there are technological means to prevent these disasters in the first place, and that there are technological solutions for dealing with problems that will emerge if disasters do occur.

Even more important, many of the groups we have mentioned (as well as railroads and airlines, parts of the chemical and nuclear industries) that do plan, have learned to cope—often quite adequately—with accidents and everyday minor emergencies. They have standard operating procedures (SOPs) to manage such situations. Unfortunately, this often leads to the belief that an accident can be treated as a little disaster or that a disaster can be viewed as a big accident. As such, it is assumed that the regular SOPs can be used in all crisis situations. But research has shown that in a disaster there is a difference of kind not just degree compared to what goes on in an accident or minor emergency. A disaster involves not just more or a difference of degree but something which is qualitatively different from the everyday situation. Preparedness planning has to recognize that in disasters organizations will have to: quickly relate to more and different groups and other organizations; adjust to losing part of their autonomy; apply different performance standards; and operate within a closer than usual public and private sector interface (for more detailed discussion, see Quarantelli, 1984c). Thus, even among those organizations that do plan, the planning is often incorrect in its basic assumptions.

A lesson from all this is that what is important is not planning but good planning. To the extent that even crisis oriented groups may proceed incorrectly, the more difficult it will be for them to undertake any kind of appropriate risk communication. It is impossible to alert and prepare the public and/or other organizations about certain kinds of dangers if the group itself does not correctly perceive the realities of the kinds of disaster situation in which it will have to operate.

5. Organizations typically have major problems in attempting to manage disasters although these are often not the expected difficulties.

It is very easy to assume that if there has been organizational disaster planning there will be successful crisis or emergency management. That would seem to be the purpose of planning. But apart from the possibility alluded to above that the planning could be poor to start with, there is

11

also the fact that planning is not management, and that the former does not automatically transform into the latter. We may perhaps clarify this by drawing a parallel. The military draws a distinction between strategy and tactics; in fact, they teach and try to implement the differences between the two. Strategy in general has reference to the overall approach to a problem or objective. But there are always situational factors or other contingencies which require particular adjustments to attain a specific goal if the overall objective is to be attained. This is the area of tactics. In somewhat parallel terms, good disaster planning involves the general strategies to be followed in preparing for a sudden community disaster. Good management involves using particular tactics to handle the specific situational contingencies which are resent or arise during the course of a disaster (Quarantelli, 1988b).

There are at least three sets of management problems during disasters which organizations have to solve. One set has to do with the information flow in the communication process. Within this there typically can be five sources of difficulty, namely: in the intra- and inter-organizational information flow, the information flow to and from organizations and the general public, and the information flow within systems of organizations. The physical means of communicating seldom are the roots of serious trouble. Second, there can be problems in the exercise of authority and decision-making. These can stem from losses of higher echelon personnel because of overwork, conflict regarding authority over new disaster tasks, and clashes over organizational jurisdictional differences. It would be extremely rare in a disaster to have any breakdown in the chain-of-command and lines-of-authority in established organizations. Third, are the problems associated with the need to have coordination as well as a loosening of the command structure. These can result from lack of consensus about what constitutes "coordination", strained organizational relationships created by new disaster tasks, and the magnitude of the disaster impact. (for a detailed discussion of all these sources of organizational difficulties in disasters, see Quarantelli, 1988b).

A major lesson from all of this is that even good planning is not enough; organizations must also learn to manage during the emergency period. Actually, given the potential difficulties it is almost certain there will be organizational problems during a disaster. This is not a statement of despair about being unable to do anything. It is instead a suggestion that it is too late to wait for a disaster to occur before starting to think of how organizations can cope with problems and what tactics they can use (those who sometime argue that every disaster is different and therefore prior planning cannot be undertaken, seem to assume the opposite). Improvement in risk communication can not wait for the disaster to occur, but also has to have a realistic conception of what actual problems will surface in disasters.

6. There is only selective organizational change at best from undergoing a disaster.

In the immediate post impact period there usually is much talk on how improvements should be made in organizational preparations for future

12

disasters. But unlike after civil disorders (at least those in the 1960s in American society), where organizational change was often the norm (Weller, 1974), there typically is relatively little change in group structures and functions after disasters (Anderson, 1970; Warheit, 1968). The talk seldom gets translated into concrete actions.

There are occasional exceptions. A few crisis-type organizations have sometimes been markedly changed after undergoing a disaster (Ross, 1978). The facilitating conditions are complex and some of the research results are not altogether consistent (see Drabek, 1986:284-288 for a discussion of some of the literature). But how the group performed during the emergency period appears to be less of an impetus to change than the willingness of some key officials to lead an effort for better disaster preparedness (particularly if preparedness was already an expectation in the organization given that future threats might have to be faced, see Forrest, 1974). In some cases, the disaster simply seem to accelerate organizational changes already planned or underway.

A lesson from this is that while organizations can be changed to be better prepared for disasters, it is difficult to do so and occurs relatively rarely. The sometime stated notion that disasters make organizations far more receptive or at least more open to change is not fully supported by the research data. To try to improve risk communications by taking advantage of changes in organizations after disasters is not the best path to follow.

Community behavior.

7. Communities generally give very low priority to preparing for disasters.

Looked at in a historical perspective, overall community disaster preparedness in American society has markedly improved in the last two decades (Wenger, Quarantelli and Dynes, 1986). There has been a broadening of the scope of the planning to include more especially technological type disasters, a general acceptance of the value of generic rather than agent specific planning, an increase in the degree of integration among local disaster oriented organizations, a decrease in emphasis on the primacy of the civil defense function, and the continuing assumption of a leadership role by the local emergency management agency (Quarantelli and Tierney, 1979), That said, general disaster preparedness has low priority--whether measured by attention, budgets or organizational participation--in most communities. The issue of planning very seldom becomes a matter of broad community interest as would be indicated by mass media focus, discussions in the political arena, or involvement of pressure or interest groups (except in isolated cases of planning around nuclear plants). In almost all areas, resources allocated to planning are very minimal and would be considerably less if it were not for federal matching funds and planning grants. Finally, it is the rare community where even all the crisis or emergency oriented groups have undertaken disaster planning, and if they have, have made organizational activity a part of the overall community effort. In short, disaster preparedness planning has very low ranking on the problem agenda of almost all communities (Rossi, Wright and Weber-

13

Burdin, 1982), The consequence is "that disaster preparedness at the community level is not highly developed at the present time" (Tierney, 1981:340).

To the extent communities do or attempt general planning, existing organizational conflicts, cleavages and disputes make the effort difficult. For example, there are often everyday stresses and strains between local police and fire departments, between them and the local emergency management agency, among hospitals and emergency medical service entities, and between public and private sector groups. These make the development of overall planning problematical since it would require the giving up of some organizational autonomy, allowing others access to organizational domains and territories, and providing resources (people, things, information) which could be used for other than the organization itself. Put another way, there are frequently deeply rooted social factors affecting organizations which work against rather than facilitate their involvement in community preparedness planning.

There are some lessons from the low priority typically assigned community disaster planning and the factors which discourage it. First, it can not be assumed risk communication will necessarily have any higher priority in community agendas. Second, the advancement and improvement of risk communication will often depend on larger social factors which have little to do directly with the merit of alerting and warning of possible threats.

8. The greater the disaster, the more there will be the emergence of new structures and functions.

Typically, the community response in disasters is fragmented and differentiated, and involves a wide variety of entities which represent different layers from governmental and nongovernmental sectors (Dynes, 1974). In addition, organizational responses are not uniform at different time phases with some groups just starting to get involved when others are already out (e.g., weather agencies have usually phased out before relief groups start operating), and with tasks of the same organization often changing through time (e.g., police who initially help in distributing warning messages undertaking search and rescue after a tornado impact).

This extreme heterogeneity in response stems from a variety of factors. For one, by law and tradition and expectation in the United States, governmental response is decentralized. So in time local agencies will be complemented by state organizations, and both in turn will be joined by federal groups. Also, by law and tradition and expectation, organizations in the public and in the private sectors are assigned various responsibilities for varying emergency time tasks. Finally, even in the most preplanned of situations, disasters draw to themselves a massive convergence of people, communications and material goods from outside the impacted area. So a major community disaster insures an uncoordinated "mass assault" (Fritz, 1961; Kreps, 1983).

Faced with this, communities often attempt to impose some overall order on the situation, attempting to bring into being what has been called a

14

"command and control" model. This essentially involves the notion of centralizing authority and operating with a top down decision making structure (for its relationship to poor planning, see Dynes, 1983). At the operational level, the effort is to answer the question: "who is in charge?"

However, research indicates that coordination rather than control is the best that can be achieved, and that in certain respects a loosening of the command structure and decentralization of decision making to lower levels will be the most effective community response (Quarantelli, 1988b). There typically is the emergence of many new behaviors and groupings in the attempt to cope with the multiple contingencies created by the disaster (Quarantelli, 1984a; Drabek, 1987). The greater the disaster the more organized improvisations of all kinds appear accompanied by pluralistic decision making in tasks ranging from search and rescue (Drabek et al., 1981) and the providing of emergency medical services (Quarantelli, 1983), to interorganizational coordination (Wenger, 1978) and community priority setting (Dynes, 1978). While the emergent phenomena is partly rooted in and comes out of preexisting structures and functions, there is also always an element of the new, novel, nontraditional or nonroutine in what can be seen at the height of a disaster, and as such there is the appearance of a temporary "synthetic community" (Drabek, 1986:227; see also Bosworth and Kreps, 1986).

A lesson in all of this is that any thinking about disasters has to come to terms with the fact of substantial emergent behavior at the community level. THose who are interested in risk communication have the task of accepting and incorporating this research observation into whatever they recommend. The challenge is in making a meaningful link between the pre- and trans-impact periods, given the lack of complete behavioral continuity between the two,

9. There are selective longer run outcomes and changes in communities that have been impacted by disasters.

A few studies show no discernible disaster related long-term effects on such community features as population, age composition, housing stock and values, rents, family income, size of work force, unemployment level, retail sales, number of businesses, etc. (Rossi et al., 1978; Friesema et al., 1979). These findings have been strongly challenged on methodological grounds (see, e.g., Drabek, 1981). However, other research indicates that there can be community changes as well as functional and dysfunctional consequences (see Scanlon, 1988). As to the former, there is some evidence (see Drabek, 1986: 293-298) that disasters can both accelerate some on-going community trends (e.g., in local governmental arrangements and power structures) and generate limited new patterns (e.g., in local mental health services and some mitigation measures such as flood proofing regulations). As to dysfunctional effects, there is some indication, for example, of consistent and complained about discrimination in rehousing of disaster victims (Quarantelli, 1984d), and particularly of magnifications of pre-impact community conflicts and generation of new ones (Quarantelli and Dynes, 1976); some of the latter is manifested in blame assignation which

however may deflect attention away from social structural flaws to a mass media influenced search for individual scapegoats (Drabek and Quarantelli, 1967). However, the conditions which will produce some disaster induced community changes or none, are far from clear.

If the research base being used about longer run community effects is valid, a lesson would appear to be that there are differential outcomes. Some would be supportive of certain kinds of risk communication, but there are also hints that a focus on the process might be dysfunctional. At least this would be true if it is assumed, as we do, that the prime efforts to cope with disasters ought to be made at the group rather than the individual level.

Societal behavior.

10. The image a society has of disasters is mostly provided by mass media stories.

What a society expects about disasters, what it comes to know of ongoing disasters, and what it learns from disasters it has had, are greatly although not exclusively learned from mass media accounts. Relatively few persons directly experience more than one major disaster in their lives. The bulk of organizations other than some crisis oriented ones and the great majority of communities except those in highly disaster prone areas can go decades without being specifically impacted by significant disasters. Yet the bulk of people as well as organizational and community officials do not hesitate to express views and opinions about what will or will not happen in disasters (see Wenger, James and Faupel, 1985). Clearly the image must be primarily derived from mass media stories (Kreps, 1980), although deeply rooted cultural beliefs and values about the nature of society and reality undoubtedly are also a factor (see, e.g., Turner et al., 1979 discussion of perception of earthquake threats). The symbolism of specific disasters recognized world wide (a Bhopal, Mount St. Helens, Three Mile Island, the San Francisco earthquake, the Great Chicago fire, Chernobyl) can particularly be attributed to mass media treatment (see, Wilkins, 1987; Patterson and Wilkins, 1988).

The importance of all this is that it suggests a very close relationship between mass media (including popular culture outlets) operations and risk communication. If the general image the vast bulk of us have about disasters is mass media derived, any efforts at risk communication must accept that as a crucial background context. Put another way, risk communication can not just assume a scientific orientation, it is always embedded in the larger sociocultural context.

Limitations on Generalizations of the Themes

Are the major themes or propositions equally applicable across the board for all the different kinds of sudden natural and technological disaster agents, or are some more agent specific? Our view is that drawing distinctions between particular agents (e.g., tornadoes versus floods) or categories of agents (e.g., natural versus technological) are not particularly

16

fruitful and in fact could be misleading. In that sense our view is that a generic rather than agent specific approach is the most useful. There are however differences among disaster agents but they are in terms of such features as predictability, speed of onset, length of forewarning possible, duration of impact, unfamiliarity, proportion of population impacted, perceived controllability, etc, all of whom cut across a number of specific disaster agents (Quarantelli, 1987a). Probably, depending on which of these dimensions would be involved, some qualifications might have to be attached to the basic themes. However, given that "we only have vague clues regarding a taxonomy of disaster events" (Drabek, 1986:1), for the present we will assume the propositions are generally valid.

Do the themes derived from sudden type disaster occasions apply across the board to other risk situations. As discussed earlier when noting the research base we were using, we as well as many others do see significant differences between quick on-set disasters and slower/diffused ones as well as deliberate conflict generated crises. That said, undoubtedly there are some similarities between these kinds of events and disasters, given that almost all of them are subcategories of collective stress situations. We have in our previous remarks hinted at and implied some of the similarities. But it is an open question to be settled by empirical data regarding the degree of similarity in behavioral phenomena for some or all of these collective stress occasions (see Quarantelli, 1987a).

Finally, the research findings have been derived understandably from studies of disasters that have occurred, but are they equally applicable to the disasters of the future? It can be anticipated that there will be some differences in future disasters (see Quarantelli, 1988d). There are at least five possibilities: (1) old kinds of disaster agents that simply will have more to hit or impact; (2) new and increasing kinds of technological accidents and mishaps that were almost nonexistent several decades ago and that frequently have synergistic effects; (3) technological advances that add complexity to old threats (e.g., measures that prevent some problems but at the cost of generating others such as fire resistant material that will lead to asphyxiation); (4) new versions of past dangers (e.g., collapses of lifelines); and (5) developing new kinds of risks (e.g. genetic engineering mishaps, computer technology failures). Therefore, the applicability of the generalizations will be dependent on what the empirical research will show about the newer kinds of disasters as they occur.

References

Abney, Glenn and Larry Hill
   1966   "Natural disasters as a political variable: The effects of a hurricane on an urban election," American Political Science Review 60:974-981.

Aguirre, Beningo and E. L. Quarantelli
   1983   "Methodological, ideological, and conceptual-theoretical criticisms of the field of collective behavior," Sociological Focus 16:195-216.

Anderson, Jon
    1968   "Cultural adaptation to threatened disaster," <u>Human Organization</u>
          27:298-307.

Anderson, William
    1970   Disaster and Organizational Change. Newark, DE: Disaster
          Research Center, University of Delaware.

Barkun, Michael
    1974   Disaster and the Millennium. New Haven: Yale University Press.

Barton, Allen
    1969   Communities in Disasters: A Sociological Analysis of Collective
          Stress Situations. New York: Doubleday.

Barton, Allen
    1970   Communities in Disasters: A Sociological Analysis of Collective
          Stress Situations. Garden City, New York: Anchor.

Baum, Andrew, R. Fleming and I. M. Davidson
    1983   "Natural disaster and technological catastrophe," <u>Environment</u>
          <u>and Behavior</u> 15:333-354.

Blanshan, Sue and E. L. Quarantelli
    1981   "From dead body to person: The handling of fatal mass casualties
          in disasters," <u>Victimology</u> 6:275-287.

Bosworth, Susan and Gary Kreps
    1986   "Structure as process: organization and role," <u>American Socio-</u>
          <u>logical Review</u> 51:699-716.

Britton, Neil
    1986   "Developing an understanding of disaster," <u>Australian and New</u>
          <u>Zealand Journal of Sociology</u> 22:254-271.

Burton, Ian and Robert Kates
    1964   "The perception of natural hazards in resource management,"
          <u>Natural Resources Journal</u> 3:412-441.

Carr, Lowell
    1932   "Disaster and the sequence-pattern concept of social change,"
          <u>American Journal of Sociology</u> 38:207-218.

Davis, Morris and Steven Seitz
    1982   "Disasters and governments," <u>Journal of Conflict Resolution</u>
          26:547-568.

Drabek, Thomas
    1970   Laboratory Simulation of a Police Communication System Under
          Stress. Newark, DE: Disaster Research Center, University of
          Delaware.

Drabek, Thomas
   1981   Commentary. Pp. 160-170 in James Wright and Peter Rossi (eds)
          Social Science and Natural Hazards. Cambridge, MA: Abt Publica-
          tions.

Drabek, Thomas
   1986   Human System Responses to Disaster: An Inventory of Sociological
          Findings. New York: Springer-Verlag.

Drabek, Thomas
   1987   Emergent structures. Pp. 259-290 in Russell Dynes, Bruna
          DeMarchi and Carlo Pelanda (eds) Sociology of Disasters: Con-
          tributions of Sociology to Disaster Research. Milan, Italy:
          Franco Angeli.

Drabek, Thomas and William Key
   1984   Conquering Disaster: Family Recovery and Long-Term Consequences.
          New York: Irvington.

Drabek, Thomas and E. L. Quarantelli
   1967   "Scapegoats, villains and disasters," Transaction 4:12-17.

Drabek, Thomas, Harriet Tamminga, Thomas Kilijanek and Christopher Adams
   1981   Managing Multiorganizational Emergency Responses. Boulder, CO:
          Institute of Behavioral Science, University of Colorado.

Dynes, Russell
   1974   Organized Behavior in Disaster. Newark, DE: Disaster Research
          Center, University of Delaware.

Dynes, Russell
   1978   Interorganizational relations in communities under stress. Pp.
          49-64 in E. L. Quarantelli (ed) Disasters: Theory and Research.
          Beverly Hills, CA: Sage.

Dynes, Russell
   1983   "Problems in emergency planning," Energy 8:653-660.

Dynes, Russell and E. L. Quarantelli (eds)
   1973   "Urban civil disturbances: Organizational change and group
          emergence special issue," American Behavioral Scientist 16:303-
          439.

Dynes, Russell, E. L. Quarantelli and Gary Kreps
   1981   A Perspective on Disaster Planning. Newark, DE: Disaster
          Research Center, University of Delaware.

Dynes, Russell, Bruna DeMarchi and Carlo Pelanda (eds)
   1987   Sociology of Disasters: Contributions of Sociology to Disaster
          Research. Milan, Italy: Franco Angeli.

19

Erikson, Kai
    1976   Everything in Its Path. New York: Simon and Schuster.

Forrest, Thomas
    1974   Structural Differentiation in Emergent Groups. Newark, DE:
            Disaster Research Center, University of Delaware.

Friesema, Paul, James Caporaso, Gerald Goldstein, Robert Lineberry and
Richard McCleary
    1979   Aftermath: Communities After Natural Disasters. Beverly Hills,
            CA: Sage.

Fritz, Charlie
    1961   Disasters. Pp. 651-694 in Robert Merton and Robert Nisbet (eds)
            Contemporary Social Problems. New York: Harcourt.

Hewitt, Kenneth
    1983   Interpretations of Calamity. Boston: Allen and Unwin.

Janis, Irving
    1951   Air War and Emotional Stress: Psychological Studies of Bombings
            and Civilian Defense. New York: McGraw Hill.

Janis, Irving and Leon Mann
    1977   "Emergency decision making: A theoretical analysis of responses
            to disaster warnings," Journal of Human Stress 3:35-47.

Kreps, Gary
    1980   Research needs and policy issues on mass media. Pp. 35-74 in
            Disasters and the Mass Media: Proceedings of the Committee on
            Disasters and the Mass Media Workshop. Washington, DC: National
            Academy of Sciences.

Kreps, Gary
    1983   "The organization of disaster response: Core concepts and proces-
            ses," International Journal of Mass Emergencies and Disasters
            1:439-465.

Kreps, Gary
    1984   "Sociological inquiry and disaster research," Annual Review of
            Sociology 10:309-330.

Kreps, Gary
    1985   "Disaster and the social order," Sociological Theory 3:49-65.

Kutak, Robert
    1938   "The sociology of crises: The Louisville flood of 1937," Social
            Forces 17:66-72.

Lechat, Michel
    1976   "The epidemiology of disasters," Proceedings of the Royal Society
            of Medicine 69:421-426.

Mileti, Dennis
    1987   Sociological methods and disaster research. Pp. 57-70 in Russell
            Dynes, Bruna DeMarchi and Carlo Pelanda (eds) Sociology of
            Disasters: Contributions of Sociology to Disaster Research.
            Milan, Italy: Franco Angeli.

Mileti, Dennis, Thomas Drabek and Eugene Haas
    1975   Human Systems in Extreme Environments. Boulder, CO: Institute of
            Behavioral Science, University of Colorado.

Moore, Harry
    1964   And the Winds Blew. Austin: University of Texas Press.

Okabe, Keizo and Hirotada Hirose (eds)
    1985   "Disaster research in Japan," International Journal of Mass
            Emergencies and Disasters 3:1-160.

Oliver-Smith, Anthony
    1977   "Disaster rehabilitation and social change in Yungay, Peru,"
            Human Organization 36:5-13.

Patterson, Philip and Lee Wilkins
    1988   "Routinized reporting of technological accidents: Television
            coverage of the Chernobyl disaster," International Journal of
            Mass Emergencies and Disasters 6:27-64

Prince, Samuel
    1920   Catastrophe and Social Change. New York: Columbia University
            Press.

Quarantelli, E. L.
    1981   Panic behavior in fire situations: Findings and a model from the
            English language research literature. Pp. 405-428 in Proceedings
            of the 4th Joint Panel Meeting, the U.J.N.R. Panel on Fire
            Research and Safety. Tokyo, Japan: Building Research Institute.

Quarantelli, E. L.
    1983a   Delivery of Emergency Medical Services in Disasters: Assumptions
            and Realities. New York: Irvington Press.

Quarantelli, E. L.
    1983b   Earthquake preparedness citizen groups: Their atypical nature and
            the conditions for their emergence. Preliminary Paper #87.
            Newark, DE: Disaster Research Center, University of Delaware.

Quarantelli, E. L.
    1984a   Emergent Behavior at the Emergency Time Periods of Disasters.
            Final Project Report #31. Newark, DE: Disaster Research Center,
            University of Delaware.

Quarantelli, E. L.
   1984b   Inventory of Disaster Field Studies in the Social and Behavioral
           Sciences 1919-1979. Newark, DE: Disaster Research Center,
           University of Delaware.

Quarantelli, E. L.
   1984c   Organizational Behavior in Disasters and Implications for
           Disaster Planning. Newark, DE: Disaster Research Center,
           University of Delaware.

Quarantelli, E. L.
   1984d   Sheltering and Housing After Major Community Disasters. Newark,
           DE: Disaster Research Center, University of Delaware.

Quarantelli, E. L.
   1985   An assessment of conflicting views on mental health: The conse-
           quences of traumatic events. Pp. 173-215 in Charles Figley (ed)
           Trauma and Its Wake: The Treatment of Post-Traumatic Stress
           Disorder. New York: Brunner/Mazel.

Quarantelli, E. L.
   1986a   Disaster studies: An historical analysis of the influences of
           basic sociology and applied use on the research done in the last
           35 years. Preliminary Paper #111. Newark, DE: Disaster Research
           Center, University of Delaware.

Quarantelli, E. L.
   1986b   Findings on organizational behavior in disasters and their
           applicability in developing societies. Preliminary Paper #107.
           Newark, DE: Disaster Research Center, University of Delaware.

Quarantelli, E. L.
   1987   "Presidential address: What should we study? Questions and
           suggestions for researchers about the concept of disasters,"
           International Journal of Mass Emergencies and Disasters 5:7-32.

Quarantelli, E. L.
   1988a   Citizen groups and hazardous waste: Their careers and conditions
           for emergence. Pp. 1757-1764 in Hazardous Waste: Detection,
           Control, Treatment: Proceedings of the World Conference on
           Hazardous Waste. Amsterdam: Elsevier.

Quarantelli, E. L.
   1988b   "Disaster crisis management: A summary of research findings,"
           Journal of Management Studies 25:373-385.

Quarantelli, E. L.
   1988c   Disaster studies: An analysis of the social historical factors
           affecting the development of research in the area. Preliminary
           Paper #128. Newark, DE: Disaster Research Center, University of
           Delaware.

Quarantelli, E. L.
    1988d   Future disasters in the United States: More and worse. Prelimi-
             nary Paper #125. Newark, DE: Disaster Research Center, Univer-
             sity of Delaware.

Quarantelli, E. L. and Russell Dynes (eds)
    1970   "Organizational and group behavior in disaster special issue,"
             American Behavioral Scientist 13:325-456.

Quarantelli, E. L. and Russell Dynes (eds)
    1976   "Community conflict: Its absence and its presence in natural
             disasters," Mass Emergencies 1:139-152.

Quarantelli, E. L. and Russell Dynes
    1977   "Response to social crisis and disaster," Annual Review of
             Sociology 2:23-49.

Quarantelli, E. L. and Carlo Pelanda (eds)
    1988   Proceedings of the Italy-United States Seminar on Major Community
             Disasters. Newark, DE: Disaster Research Center, University of
             Delaware.

Quarantelli, E. L. and Kathleen Tierney
    1979   Disaster preparedness planning. Pp. 79-90 in Fire Safety and
             Disaster Preparedness. Washington, DC: American Association for
             the Advancement of Science.

Ross, Alexander
    1978   Organizational innovation in disaster settings. Pp. 215-232 in E.
             L. Quarantelli (ed) Disasters: Theory and Research. Beverly
             Hills, CA: Sage Publications.

Rossi, Peter, James Wright, Sonia Wright and Eleanor Weber-Burdin
    1978   "Are there long term effects of American natural disasters?" Mass
             Emergencies 3:117-132.

Saarinen, Thomas (ed)
    1982   Perspective on Increasing Hazard Awareness. Boulder, CO:
             Institute of Behavioral Science, University of Colorado.

Scanlon, Joseph
    1988   "Winners and losers: Some thoughts about the political economy of
             disaster," International Journal of Mass Emergencies and Disas-
             ters 6:47-64.

Scanlon, Joseph and Massey Padgham
    1930   The Peel Regional Police Force and the Mississauga Evacuation.
             Ottawa, Ontario: Canadian Police College.

Schorr, John
    1987   "Some contributions German Katastrophensoziologie can make to the
           sociology of disaster," International Journal of Mass Emergencies
           and Disasters 5:137-153.

Sorokin, Pitirim
    1942   Man and Society in Calamity, New York: Dutton.

Taylor, Verta
    1977   "Good news about disaster," Psychology Today 11:93-94.

Taylor, Verta
    1978   Future directions for study. Pp. 251-289 in E. L. Quarantelli
           (ed) Disasters: Theory and Research. Beverly Hills, CA: Sage
           Publications.

Tierney, Kathleen
    1981   "Community and organizational awareness of and preparedness for
           acute chemical emergencies," Journal of Hazardous Materials
           4:331-342.

Torry, William
    1979   "Anthropology and disaster research," Disasters 3:43-52.

Turner, Ralph, Joanne Nigg, Denise Paz, and Barbara Young
    1979   Earthquake Threat: The Human Response in Southern California.
           Los Angeles: Institute for Social Science Research, University
           of California.

Warheit, George
    1968   The Impact of Major Emergencies on the Functional Integration of
           Four American Communities. Ph. D. dissertation. Ohio State
           University.

Weller, Jack
    1974   Organizational Innovation in Anticipation of Crisis. Newark, DE:
           Disaster Research Center, University of Delaware.

Wenger, Dennis
    1978   Community response to disaster: Functional and structural altera-
           tions. Pp. 17-47 in E. L. Quarantelli (ed) Disasters: Theory and
           Research. Beverly Hills, CA: Sage.

Wenger, Dennis, Thomas James and Charles Faupel
    1985   Disaster Beliefs and Emergency Planning. New York: Irvington.

Wenger, Dennis, E. L. Quarantelli and Russell Dynes
    1986   Disaster Analysis: Emergency Management Offices and Arrangements.
           Final Project Report #34. Newark, DE: Disaster Research Center,
           University of Delaware.

Wenger, Dennis, E. L. Quarantelli and Russell Dynes
   forthcoming Mass Media Systems and Community Hazards and Disasters.
        Final Report to National Science Foundation.

Wettenhall, Roger
   1979   "Disaster and social science in Australia," <u>Disasters</u> 2:241-245.

White, Gilbert (ed)
   1974   Natural Hazards: Local, National, Global. New York: Oxford.

White, Gilbert and Eugene Haas
   1975   Assessment of Research on Natural Hazards. Cambridge, MA: The
        MIT Press.

Wilkins, Lee
   1987   Shared Vulnerability: The Mass Media and American Perception of
        the Bhopal Disaster. Westport, CT: Greenwood Press.

Wright, Charles
   1986   Mass Communication. A Sociological Perspective. New York: Random
        House.

Zarle, Donald, Don Hartsough and Donald Ottinger
   1974   "Tornado recovery: The development of a professional-
        paraprofessional response to a disaster," <u>Journal of Community
        Psychology</u> 2:311-320.