

WORKING PAPER #83

EMERGENCY\*

E. L. Quarantelli

Disaster Research Center  
University of Delaware

1989

\*Manuscript prepared for inclusion in Volume 1 of the Italian Encyclopedia of the Social Sciences (to be translated into Italian).

EMERGENCY by Enrico L. Quarantelli

SUMMARY: 1. Introduction. 2. Sociohistorical development of the field. 3. Conceptualizations. 4. Major research codification efforts. 5. Applicability of findings cross-societally. 6. Studies in the future. 7. Conclusion. 8. Bibliography.

1. Introduction.

In everyday speech, the word "emergency" usually signifies a sudden and unexpected condition calling for immediate action. In the last four decades, social scientists starting from popular usages of the term, have increasingly attempted to conceptualize emergency as part of the social situation generated by natural and technological disasters or catastrophes. In fact, to a considerable extent, the theoretical work and empirical research on the social aspects of disasters is the equivalent of the social scientific analysis and study of emergencies. Actually whether the term "disaster", "catastrophe" or "emergency" is primarily used, seems to depend on the particular language involved. For example, Italian social scientists have somewhat preferred to use the term "emergency" whereas Americans have been inclined to employ the word "disaster" even though the substantive phenomena being discussed is about the same in both cases. However, since most of the social scientific literature that exists in the area uses "disaster" rather than "emergency" or "catastrophe", we will in this article mostly but not exclusively use the first term. Part of this tendency and also lack of complete consensus can be attributed to the fact that social science studies in the area are but about four decades old, and until recently, were primarily undertaken in the United States and Canada.

Consequently, we will first generally describe the sociohistorical development of this area of study. Then the various conceptualizations advanced of the key term, disaster, are discussed. This is followed by a summary of the major research codification efforts made up to the present. We then make a brief statement about the general applicability of findings across different societies, and follow with a projection of studies needed in the area in the future.

2. Sociohistorical development of the field.

While the first empirical study was done in the United States as a Ph. D. dissertation in sociology at Columbia University (see Prince, 1920, who examined the social changes in the community that followed a massive ship explosion in the harbor of Halifax, Canada), almost nothing else of either a theoretical or research nature was done until the 1950s. At that time, the U.S. military initiated studies of actual peacetime disasters with the intent of extrapolating the findings to the emergencies that might be potentially generated by a direct wartime attack for the first time on the American continent and the civilian population. While the work was undertaken at several universities, the most important was at the National Opinion Research Center (NORC) at the University of Chicago during 1950-1954 (see Marks et al., 1954).

In the last half of the 1950s the American military lost interest in funding studies of disasters. They were replaced by civilian agencies who helped the U.S. National Academy of Sciences to undertake a series of social psychological studies of mass emergencies. This research empirically documented that many widely held beliefs about human behavior at the height of emergencies, such as that victims typically would panic, engage in widespread looting, or were passive in responding, were false and mythical. Instead, survivors generally maintain much self control are extensively prosocial, and very active in their emergency time actions. Problems exist, but they are, for example, of the assimilation of danger cues to the normal, unwillingness of family members to evacuate unless all are present, and massive convergence of people, equipment and communication on the emergency site.

Several features of the pioneering work starting with what was done at NORC became the dominant way later research was undertaken in the United States. The great majority of the initial studies were carried out by sociologists, a pattern which continues to the present day. This early research typically sent teams of trained workers to the field during the emergency time periods of disasters; today, the study of disasters is still the prime exponent of "firehouse" research, that is, maintaining trained teams ready to move immediately into a disaster site when an emergency threatens or occurs. The early work also gathered its field data primarily through a qualitative research methodology. Currently, the use of open-ended interviewing, systematic participant observing, and extensive document collecting remain the major field research techniques typically used everywhere by most researchers of mass emergencies (see Quarantelli, 1987).

With the cessation of studies at the Academy in 1961, sociologists in 1963 founded the Disaster Research Center (DRC) which took as its research focus, organizational and community preparations for and responses to mass emergency situations. At the University of Delaware since 1985, the Center has done research on over 500 such situations (mostly natural and technological disasters, but also some civil disturbances), including several dozen outside of the United States. DRC also established the first specialized library on disaster and mass emergency topics which is now the largest in the world, has created an interactive computer network of researchers in the area, and has a publication series which now numbers over 350 items.

The decade of the 1970s and the early 1980s brought with it a substantial increase in mass emergency and disaster studies in the United States. In part this resulted from the establishment of new centers besides DRC such as the one at the University of Colorado, the Natural Hazards Research and Applications Information Center, which was formed mostly by geographers. Its major function is to increase interaction between interdisciplinary researchers on hazards and research users, and it does this through workshops, an extensive publication series and a newsletter (with over 7,000 circulation around the world), and support for small scale quick response studies of emergencies. In the last decade an Office of Hazards Study has been established at Arizona State University, a Hazards Assessment Laboratory at Colorado State University, a Center for Hazard Reduction and Recovery Center at Texas A & M University, and with an increased interest in chemical and nuclear emergencies, an Industrial

Crisis Institute at New York University. In addition, reflecting the institutionalization of emergency and disaster studies in higher education in the United States, there are research programs also at universities such as Buffalo, Clark, Cornell, Pittsburgh, North Carolina, California, Denver, New Mexico, Pennsylvania and William and Mary College. Some social science studies also go on at non-academic institutions such as the Oak Ridge National Laboratory and the Battelle Human Research Institutes, and there are training programs at the University of Wisconsin and North Texas University; the latter offers a regular undergraduate and degree program in Emergency Administration and Planning. (The federal government has its own training program and centers of teaching emergency planning).

The above social science centers and programs involve not only sociologists, but geographers, political scientists, psychologists, anthropologists, as well as behaviorally oriented medical researchers and public administrators. Not only do these social scientists make regularly scheduled presentations at the annual national and regional meetings of their professional associations, but geographers, public administrators, sociologists, and anthropologists have their own formal specialized subgroups within their own associations. While there is some cross membership from different disciplines, most researchers however belong only to their own disciplinary disaster oriented groups.

While DRC from its beginning studied within the same framework both natural and technological disasters, much of the work of others through the 1970s tended to focus on natural hazards. Also, the early work concentrated on the emergency time period with some attention also being paid to preparedness questions. Among topics of individual behavior that had been considerably studied were responses to warnings, the myths of disaster behavior, evacuation behavior, and mental health consequences for survivors. At the group level, much work was done on how organizations differentially adapted to emergencies, the characteristics of informal emergent groups, the relationship of planning to organizational response and management of mass emergencies, problems of organizational mobilization and communications in such occasions, and community coordination of interorganizational responses.

However, in the late 1970s and into the 1980s, research broadened out in two major ways. Increasingly studies have been done on technological threats and impacts from dangerous chemical production and transportation, nuclear power plant accidents, hazardous waste disposal, and fires in high rise buildings. Parallel to that, research has broadened out from a prime focus on emergency preparedness and response to consideration also of preimpact prevention and mitigation, and of post-recovery matters. For example, DRC did extensive studies on sociobehavioral problems in preparing for and managing acute chemical emergencies. Other researchers have looked at social aspects of recovering from toxic waste pollution at Love Canal and similar situations. Social scientists are still heavily involved in studying the nuclear plant accident at Three Mile Island, making it the most studied mass emergency in history. In fact, in the last decade, researchers with interest in risk assessment and risk management have also become involved in the area as a result of their analyses of how man made or technological threats come into being; they have sought to examine critically how decisions are reached about the relative safety of nuclear power plants, dangerous food additives, hazardous toxic waste sites, and similar

situations which can generate both diffuse and acute emergencies. While most in the area believe natural and technological disasters can be studied in the same way and with the same framework, some researchers assume there are agent-specific elements involved precluding the generic approach to mass emergencies favored by U.S. government policy and most involved social scientists.

In the last two decades the large increase of researchers and studies on the American scene has been paralleled by an equal development elsewhere in the world. While a few systematic studies were undertaken as early as the late 1960s in Japan, Canada and France, the greatest initiation of systematic social science research occurred in the next decade. Sociologists have been prominent in the development of extensive studies and centers in Sweden, West Germany and in Italy (particularly at the Institute of International Sociology in Gorizia), as well as leading the way in Greece, Columbia, New Zealand and Mexico, and more recently in China and in the Soviet Union. However, in other countries such as Argentina, Belgium, Canada, France, Great Britain, India, Japan and The Netherlands, other kinds of social scientists from psychologists to mass communication experts to political scientists have been involved.

One consequence of the flourishing of studies has been its internationalization in several ways. Joint research seminars have been held, for instance, between Americans and Italians (see Quarantelli and Pelanda, 1989, Proceedings) and between American and Japanese researchers. Joint studies using a common field research design have been carried out in the United States and Japan, and one is just being initiated between Chinese and American researchers. It is also not uncommon now for field work to be conducted outside of one's own country; for example, Germans and Americans have studied earthquakes in Italy; Canadian have looked at cyclones in Australia; French researchers have done research on explosions in Mexico; and the Japanese have carried out research in earthquakes in the United States, Mexico, and Chile. Also, an around the world network of researchers has been institutionalized with the establishment in 1982 of the Research Committee on Disasters within the International Sociological Association (although more than 40 percent of members are not sociologists). It has members in over 30 countries, publishes its own professional journal, the International Journal of Mass Emergencies and Disasters, and its own newsletter, Unscheduled Events. In addition, there are four other specialized journals which are primarily outlets for social scientists, namely, Disaster Management in the United Kingdom, Disasters, the Industrial Crisis Quarterly, and Disaster Management in India, as well as a specialized monthly newsletter, Hazard Monthly.

### 3. Conceptualizations.

From the initiation of work on mass emergencies and disasters there have been efforts at conceptual clarification, although no full consensus yet exists although some ideas have won more acceptance than others among social scientists.

The earliest proposed definitions equated disasters with some features of a physical agent, and distinctions were made between "Acts of God" and "man made" agents. Thus, a land movement of a certain kind is called an earthquake; the transformation as a result of human error, of an inert liquid into an expansive gas is called a chemical explosion. On other occasions, the emphasis was placed

on the physical effects of the agent, i.e., the damage done to life and property by the presence of a volcanic eruption, flood, fire or poisonous gas. The implicit notion is that if there is no physical agent and material effect, there is no emergency or disaster.

But even the first conceptions advanced by social scientists emphasized social rather than physical aspects, something which results in the significant disruption of social life. At the same time, it was noted that the perceived threat of something impacting could be just as socially disruptive as an actual impact. For example, the evacuation that results from a rumor of a dam collapse is often not that different from what occurs in an actual dam collapse. In even more recent formulations, disasters are seen not only as social constructions of reality, but as the political definitions of certain socially disruptive crises in social systems. Marxist based approaches, set forth by some British and German researchers, sometime take this view (see Schorr, 1987) Still other researchers equate disasters with situations where the demand for emergency action by organizations exceeds their capabilities for response. This formulation borrows heavily from models of psychological and social stress. Finally, some of the more recent conceptions of disasters see them as overt manifestations of latent societal vulnerabilities. Thus, in some work in Italy (see Pelanda, 1986) and in Germany (see Clausen and Dombrowsky, 1983), a disaster is a manifestation of a weakness in the social structure or system. Sociologists, political scientists, and geographers in the area have increasingly taken this point of view.

These formulations agree that a disaster is social phenomena of some kind that has to be identified in social terms. There may or may not be the impact of a physical agent, but there is always some kind of nonroutine social response to the emergency. This response reflects some perception of difficulties in the social order.

Many although not all current social scientists doing work in the area would probably accept a concept of disaster as follows: an observable in time and space social occasion, in which social entities undergo disruptions of their routine social activities, as a result of an actual or perceived threat from the relatively sudden appearance of dangerous natural and/or technological agents, which cannot be directly and fully controlled by existing social knowledge. Thus, a flood or a chemical explosion--as might be popularly understood--is not viewed as a disaster for study purposes unless it exhibits all the indicated characteristics. Generally, the lowest level social entity accepted as being able to have a disaster would be a community, but there is not complete agreement on this.

A matter of considerable conceptual dispute is whether social happenings involving intentional, deliberate human activity to produce social disruption, such as occurs in riots, civil disturbances, terrorist attacks, product tampering or sabotage, or wars, should be considered as disasters. Those who oppose this classification believe that conflict situations are inherently different from the more consensus type occasions such as result from natural and technological disaster agents, in that in the latter there is no conscious attempt to bring about negative effects as is true in the case of the former. The argument is that the conditions which produce conflicts and the characteristics they exhibit

are essentially different from the conditions and characteristics which are present in what they call disasters (see Quarantelli, 1987). However, there is general agreement that both conflict and consensus type emergencies are part of a more general category of collective stress situations (see Barton, 1970).

#### 4. Major research codification efforts.

The research output has led to five major general efforts to pull together what has been learned. We leave aside attempts to codify the research knowledge about specific areas such as warning systems and behavior, the delivery of emergency medical services, the role of emergent groups, search and rescue activity, and panic behavior; many of these specialized codifications have been done at DRC.

Fritz produced the first descriptive attempt to codify what was then known about the social aspects of disaster behavior. Generally, he sees the studies up to that time as indicating that much of what was commonly believed about the behavior of individuals in mass emergencies was not supported by research findings, what are frequently these days called disaster myths (see Fritz, 1961).

Barton in 1970 in Communities in Disasters examines a range of issues, from what motivates persons in disasters, to how personal and organizational behaviors are linked during emergencies, and what affects interorganizational coordination during such times. Using a variety of sources, he also advances an interrelated model of 71 propositions to explain and to predict the rise of the "therapeutic community" or the social support system that has a number of positive benefits for survivors. His volume still offers many untested hypotheses about behavior in mass emergencies, from role conflict possibilities to factors influencing organizational mobilization.

Dynes in another codification in 1974, Organized Behavior in Disasters, mostly presents a systematic overview of organizational structure, process, and problems during the pre-, trans-and post-impact periods of emergencies. Using earlier ideas from Quarantelli (see 1966) he suggests that organizational mobilization and problems of coping with the uncertain social environment of a disaster can be understood by noting that four different types of groups will be involved in the emergency response, namely, established, expanding, extending, and emergent organizations. Major hypotheses are proposed on how interorganizational relationships are effected by perceptions of organizational legitimacy, and how overall community disaster response emerges from the creation and coordination of different tasks carried out by the groups responding to a mass emergency.

Still another general codification was attempted by Mileti, Drabek and Haas in 1975. Using 191 published studies, they categorized 1,399 findings, by level of analysis and time period of the emergency, in a "knowledge matrix". This resulted in a very detailed compendium of findings about disaster behavior at the individual, group, organizational, community, and societal levels. However, the authors deliberately chose not to generate a theory from their overview or to attempt to link theoretically the disparate findings they present.

These and other early codification efforts (see Quarantelli and Dynes, 1977) sought to replace common myths with empirically based findings about individual

behavior in mass emergencies. They also emphasized that organizations typically had information flow and coordination difficulties in responding to disasters, and were both more a source and locus of problems in emergencies than were individual victims. Stressed too is that much of the organized response at the height of the emergency time period has a strong emergent quality. In addition, most of the codification efforts made an attempt--and not surprising in that all the earlier codifiers were sociologists--to link the nascent field of disaster studies to the conceptual vocabulary and theoretical framework of general sociology (this was a decade later made more explicit in Dynes, Demarchi and Pelanda, 1987, Sociology of Disasters: Contributions of Sociology to Disaster Research).

The most recent general codification effort in 1986 has been by Drabek. He not only systematically reviewed not only the more significant English language literature, but took into account some of the research done in Japan and in Italy. From an examination of around 1,000 published items he summarizes the current knowledge about 153 topics into 751 major conclusions and 1,250 specific findings. Basically he shows that the current social science knowledge is very uneven, but that there has been a substantial gain in knowledge over what was known even just a dozen years earlier about disaster and emergency behavior at different social levels.

The attempts to codify general and specific research findings have been limited by the fact that the data is of highly varying quality and that there have been very few efforts at replication studies. Many "findings" are often derived from a relatively few pieces of research making generalizations difficult. However, an encouraging sign is that independently done studies in Japan, Italy, Australia and elsewhere have fairly consistently, although not always, confirmed a number of the earlier American and Canadian research conclusions, for instance, with respect to the absence of major pathological and antisocial behavior by disaster victims, the ubiquity of mass convergence upon disaster sites, that evacuation is almost always by the family or household unit rather than isolated individuals, that search and rescue is first and primarily undertaken by survivors at the disaster site, the absence of a direct relationship between preparedness planning and organizational managing of an emergency situation, that informal emergent groups almost always play an important role in the emergency time period of mass emergencies, and the probability of conflicts among responding groups in a community disaster.

##### 5. Applicability of findings cross-societally.

The great majority of studies have been done in highly urbanized and industrialized societies, and the majority of those in the United States. A meaningful question therefore is how well can research findings mostly obtained in one type of society and one country, be extrapolated to other kinds of social systems such as those found in developing countries, or from America to Italy?

It has been hypothesized that cross-societal differences in disaster responses at the emergency time period vary directly with the level of the behavior being examined. That is, universal patterns of behavior are more likely at the individual or human behavior level. But societal specific behavior patterns are

more likely as one moves up to the family, the organization, the community, and the societal levels.

Such cross-societal research as has been undertaken seems supportive of the hypothesis. For example, panic flight behavior is rare among community disaster victims in any society. Search and rescue activity is primarily carried out by survivors, neighbors and private citizens. In contrast, organized nation wide mitigation measures to prevent disasters, and reconstruction of communities tend to vary very much from one society to another. While the general hypothesis appears to have some validity, it is yet to be fully empirically documented.

## 6. Studies in the future.

Even if we were to attain the chimerical goal of complete knowledge of behavior in extreme situations, there would still be much to study. This is because the mass emergencies and disasters of the future are almost certainly to be more and worse than those the world faces at the present time. That is, quantitatively and qualitatively, human beings and groups can anticipate the future will be worse than the present and the past. Even with the very likely better mitigation and preparedness planning that will occur, we can not be sanguine about what will happen in the decades and centuries ahead.

This is because there are going to be changes in the dangers that will exist. In at least five ways risks and threats to human beings and their societies will increase: 1) the kinds of natural disaster agents that we are accustomed to--such as earthquakes, hurricanes, volcanic eruptions--will simply have more to impact. Normal population growth and higher denser concentration of inhabitants in risk prone localities such as flood plains, insure that in the future there will be more people and human settlements that will be affected, even without any increase in frequency of natural agents per se. 2) there are increasing kinds of technological accidents and mishaps that are new in the sense they were almost non-existent before World War II. There are the dangers associated with the production, transportation and use of dangerous chemicals (Bhopal being only a dramatic instance of this recently), the more slower developing risks in hazardous waste sites (such as at Love Canal and the instances of asbestos poisonings), as well as the threats involved in nuclear weapons and plants as Chernobyl showed. 3) there are technological advances that create risks and complexities to old threats. Thus, we prevent fires in high rise building by constructing them with materials and furnishings that are highly combustible and toxic, or in removing hazardous substances from solid sewerage waste we generate products that contain dangerous viruses and gases. 4) there are new versions of old kinds of threats such as urban rather than rural droughts or the large scale collapse of the infrastructure of lifeline systems in metropolitan areas. And 5) there are constantly newer kinds of risks developing that have not been traditionally thought of as involving emergencies and disasters; these range from what we already have by way of the AIDS epidemic to the biological threats that are inherent in genetic engineering to the crises that will occur as the world increasingly becomes dependent on computers that are bound to fail somewhere at some key point with drastic consequences for human life.

## 7. Conclusion.

Contrary to what even some of the pioneer researchers thought, it is not only possible to study behavior in emergencies and disasters, but quick response studies have become the accepted way to do so. Social science research in the area has become institutionalized on a world wide basis. Much has been learned even though there is still no complete agreement on a central question: what is a disaster? The knowledge acquired so far shows that there were many common and widespread misconceptions of behavior in emergency situations. In general, human beings react well fairly well, whereas organizations have serious problems in mass emergencies. There are more universal rather than cross-societal differences in emergency time behavior, but the disasters to be anticipated in the future will continue to provide a challenge to social scientists interested in the area.

## Bibliography.

- Barton, A. Communities in disasters, New York 1970.
- Burton, I. et al. The environment as hazard, New York 1978.
- Cattarinussi, B. et al. Il disastro: Effetti di lungo termine nelle aree colpite dal terremoto del Friuli, Udine 1981.
- Clausen, L. and W. Dombrowsky (eds.) Einführung in die soziologie der katastrophen, Bonn 1983.
- Drabek, T. E. Human system responses to disaster: An inventory of sociological findings. New York 1986.
- Drabek, T. E. et al. Managing multiorganizational emergency responses, Boulder 1981.
- Dynes, R. Organized behavior in disasters, Newark, Delaware 1974.
- Dynes, R., B. Demarchi and C. Pelanda (eds.) Sociology of disasters: Contributions of sociology to disaster research. Milano, 1987.
- Flynn, C. B. and J. A. Chalmers. The social and economic effects of the accident at Three Mile Island, Tempe, 1980.
- Foster, H. Assessing disaster magnitude: Social science approach in Professional Geographer 28, 1976, pp. 241-247.
- Fritz, C. Disasters in Merton and Nisbet (eds.) Contemporary social problems, New York 1961, pp. 651-694.
- Hewitt, K.(ed.) Interpretations of calamity, Boston 1983.
- Kreps, G. Sociological inquiry and disaster research in Annual Review of Sociology 1984, 10, pp. 309-330.

- Kreps, G. Disaster and the social order in *Sociological Theory* 3, 1985, pp. 49-64.
- Lagadec, P. Etats d'urgence, Paris 1988.
- Levine, A. Love canal: Science, politics and people, Lexington 1982.
- Marks, Eli et al. Human reactions in disaster situations. Chicago 1954.
- Mileti, D., T. Drabek and E. Haas. Human systems in extreme environments. Boulder 1975.
- Okabe, K. and H. Hirose (eds.) Disaster research in Japan in *International Journal of Mass Emergencies and Disasters* 3, 1985, pp. 1-160.
- Pelanda, C. Disastro e vulnerabilita sociosistemica in *Rassegna Italiana di Sociologia* 22, 1982, pp. 507-532.
- Pelanda, C. Metodologia per l'analisi della vulnerabilita sociostrutturale ai disastri. Gorizia 1986.
- Perrow, C. Normal accidents: Living with high risk technologies, New York 1984.
- Perry, R. Comprehensive emergency management, London 1985.
- Prince, S. Catastrophe and social change. London 1920.
- Quarantelli, E. L. Organizational behavior in disasters and implications for disaster planning, Newark, Delaware 1985.
- Quarantelli, E. L. What should we study? Questions and suggestions for researchers about the concept of disasters in *International Journal of Mass Emergencies and Disasters* 1987,5, pp. 7-32.
- Quarantelli, E. L. Research findings on organizational behavior in disasters and their applicability in developing countries. Newark, Delaware 1987.
- Quarantelli, E. L. and R. Dynes. Response to social crisis and disaster in *Annual Review of Sociology* 1977, 3, pp. 23-49.
- Quarantelli, E. L. and Carlo Pelanda (eds.) Proceedings of the Italy-United States seminar on preparations for, responses to and recovery from major community disasters. Newark, Delaware 1989.
- Schorr, J. Some contributions of german katastrophensoziologie to the sociology of disaster in *International Journal of Mass Emergencies and Disasters* 5, 1987, pp. 115-135.

Tierney, K. A primer for preparedness for acute chemical emergencies, Newark, Delaware 1980.

Turner, B. The social aetiology of disasters in Disasters 3, 1979, pp. 53-59.