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EMERGENT BEHAVIORS AND GROUPS IN THE CRISIS TIME PERIODS OF DISASTERS

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Abstract

This paper summarizes a sociological study of emergent behaviors and groups in the crisis time periods of disasters. It is noted that while emergent social phenomena has been observed by disaster researchers since the initial development of the field in the 1950s, the topic has not been systematically studied until recently. Building on an earlier sociologically grounded fourfold typology of organized behavior in disasters developed by the Disaster Research Center (DRC), the research we undertook focused on the full range of emergent social phenomena that could appear. The most important finding was that even in organizations and groups that were not emergent, there was nonetheless considerable behavioral emergence. This observation is used to develop a new typology of emergence that places emergent behaviors within the same analytical framework as emergent groups. Although our research focused on the characteristics of emergent phenomena, we also advance some general hypotheses about the social factors involved in emergence. Among final concluding remarks is the observation that although the sociological subfield of collective behavior has both informed and been informed by disaster research on emergence, an even stronger link would be desirable.

*Data used in this report were obtained in field studies done by the Disaster Research Center (DRC) under different grants and contracts, but mostly under Federal Emergency Management Agency Cooperative Agreement EMW-K-0881 FEMA Work Unit 2651F (for the limited circulation final report on that contract, see Quarantelli, 1984a). The author is solely responsible for the analysis of the data so the observations made and conclusions drawn do not necessarily reflect the views of any of the funding agencies.

INTRODUCTION

This paper primarily discusses the characteristics of emergent social phenomena in the crisis time periods of disasters. We initially note that while emergence in such occasions has long been observed, the topic did not become the focus of systematic sociological study until rather recently. We then briefly allude to the nature of the data gathered by the Disaster Research Center (DRC) in a series of field studies of emergence in disastrous occasions, and then more extensively describe the research observations made. This is followed by a discussion, building upon an old DRC typology of organized behavior in disasters, that sets forth a new typology of emergence that places emergent behaviors within the same analytical framework as emergent groups. Although the research reported focused primarily on the characteristics of emergent phenomena, we then advance some hypotheses about social factors or conditions that might generate emergence. In concluding observations it is noted that while the sociological subfield of collective behavior has both informed and been informed by disaster research on emergence, a stronger link would be desirable.

In fact, most of what happens socially at times of natural and technological disasters lends itself very well to a full range of sociological inquiries and analyses. While it would be difficult to get most sociologists to agree completely on one common definition of sociology, few would disagree that:

> the core of sociological inquiry centers around the analysis of groups (Shibutani, 1961: 32).

Similarly, many would go along with the contention that:

> if we define groups as aggregates consisting of people who are cooperating in some common enterprise, this would include both organized and unorganized aggregates (Shibutani, 1961: 33-34).

Given that, it is not surprising that a major kind of unorganized group, those that are of an emergent nature, those that are collective behavior in form, have long intrigued sociologists doing disaster research.

PAST RESEARCH

Actually, the emergence of all kinds of new and informal groups at times of disasters has long been anecdotally noted. Casual historical observations going back to antiquity have been made about the appearance of ad hoc and temporary groupings, especially in catastrophic occasions such as major earthquakes or plagues (for

descriptions of the Black Death in Europe, see Gottried, 1983). However, detailed and focused sociological attention on such social phenomena has had to await the emergence itself of systematic disaster research, which occurred only in the early 1950s in the United States (see Quarantelli, 1987, 1994).

In the pioneering days of social science field research on disasters in the 1950s-1960s, while there is frequently allusion to the appearance of new groups without preimpact existence, operating in the impact or transemergency time period, it is almost always in passing (see e.g., Form and Nosow, 1958; Fritz, 1961; Barton, 1963; Bates, Fogleman, Parenton, Pittsman and Tracy, 1963; and Zurcher, 1968). Almost never were emergent groups the specific or prime focus of any particular study. Even at DRC this was true; thus, while two of the very first DRC field studies undertaken dealt with emergent coordinating groups of local officials during a Montana flood (Yutzy, 1964), and after the Indianapolis Coliseum explosion (Drabek, 1968), these groupings came to the attention of the researchers almost by accident rather than being intentional objects of study.

Nevertheless, some clues about their nature were suggested implicitly if not explicitly. The groups involved were organized around very high priority crisis time tasks such as the coordination of interorganizational operations, the diffusion of information to citizens, the mobilization of resources, the exercise of authority, the setting of policies on crucial matters such as the ordering of evacuation, the carrying out of damage assessment as well as search and rescue, the providing of emergency medical services and the handling of the dead, etc., but the full range of tasks undertaken remained unclear. The emergent groups also appeared to be composed of public officials as well as private citizens; in addition at times there were combinations of the two, plus participants from private organizations. But it was far from clear which possible permutations and combinations would appear in connection with what crisis time tasks.

With little existing knowledge about the characteristics of emergent groups, it is not surprising that there were almost no systematic presentations in the literature in the first two decades of research about the circumstances or conditions which generated such groupings. A few authors advanced some hypotheses about what might lead to their appearance, but these came more out of theoretical speculations than out of empirical research studies (e.g., see Quarantelli, 1970; Stallings, 1978).

Nevertheless, this early work did contribute to the development at DRC of a fourfold typology of the full range of organized behavior in disasters; namely that there are established, expanding, and extending organizations, and emergent groups in community crises. The typology assumed that all organized behavior would use either old or new social structures and would undertake either old of new

tasks (first stated in Quarantelli, 1966). Cross classifying these two dimensions produced four distinctive types or organized groupings as follows:

		STRUCTURE: Old	STRUCTURE: New
TASKS: Old		Type I Established	Type II Extending
TASKS: New		Type III Expanding	Type IV Emergent

This typology for a decade generally did guide much DRC work on organizations. However, Type IV or emergent groups did not at that time become the focus of systematic research by DRC or anyone else, although occasionally they were studied (e.g., in work by Hershiser and Quarantelli, 1976 on informal group handling of dead bodies in several disasters).

THIS NEW STUDY

But finally in the 1980s, DRC did initiate two major but separate studies of disaster related emergent groups. One line of research focused on the emergence of citizen groups in preimpact and postrecovery times, that is, apart from the emergency or crisis time period of disasters. The results of that research have already been fully published elsewhere (see, Neal, 1983, 1984, 1985; Green, 1984; Quarantelli, 1984a, 1985; 1988, 1989; Stallings and Quarantelli, 1985; Green, Neal and Quarantelli, 1989) and therefore will not be repeated in this article. Our focus in this paper instead will be on the second line of research which did deal with emergence at crisis time periods.

There were three sources of data in this last study. First, in-depth field studies were undertaken of emergent phenomena in two major floods, one in Ft. Wayne, Indiana and the other in Salt Lake City, Utah. DRC field teams visited both localities twice, and amassed several score open ended type interviews, considerable documentary data, and other relevant information (examples of the field guides used are presented in Quarantelli, 1984a: 32-36). Second, more circumscribed but nevertheless field studies were undertaken of specific emergent phenomena in the following other disaster occasions: the Coalinga, California earthquake; a flood in New Orleans, Louisiana; a landslide in the Washoe Valley, Nevada; a series of sequential floods in Jackson, Mississippi; and a set of concurrent tornadoes/floods in the Houston, Texas area (some of the data gathering instruments used are given in Quarantelli, 1984a: 32-36). Finally, observational data of different kinds were obtained in connection with other DRC examinations of the following

disastrous occasions: a threatening toxic chemical incident in Denver, Colorado; a flood situation in Slidell, Louisiana; several flooded communities in Missouri; a mudslide in Farmington, Utah; a coastal erosion episode in Santa Monica, California; and a chemical explosion threat in Taft, Louisiana (the last occasion is reported on in detail in Quarantelli, Phillips and Hutchinson, 1983). All examples cited are taken from the DRC work, unless other indicated.

RESEARCH FINDINGS

We first separately present our specific observations derived from our two in-depth studies and from our other specific field studies. The intent here is mostly descriptive. In the following section our more analytical findings and observations are presented.

1. The two in-depth studies.

There were both major behavioral differences and major similarities in the Fort Wayne and the Salt Lake city flood disasters. In both cases, for example, there was extensive use of volunteers who were collectively mobilized and used. Also, in both instances the major emergency responders had considerable time to prepared for impact, but when the disaster occurred it exceeded expectations.

On the other hand, while there was extensive emergent phenomena, of both a group and of a behavioral nature in Salt Lake City during the emergency period, there was relatively little in Fort Wayne. In Salt Lake City, a highly developed, established preimpact social structural factor, i.e., the existence of a complex of religiously based social networks of citizens who could be easily mobilized for the emergency, seemed to actually facilitate emergence. But in Fort Wayne, extensive local government pre-flood emergency planning appeared to discourage emergence. If nothing else the difference in the two occasions indicates the danger of attempting to generalize from a single disaster experience. In a superficial way these two disasters might appear similar since they both involved the massive use of citizen "volunteers" to respond to a flood emergency. However, in many respects there were major differences.

In Salt Lake City, major flooding was anticipated weeks before it occurred. However, when it happened, the extent of the flooding considerably exceeded expectations. The organized response was therefore both to an anticipated threat and to the actual occurrence. The response in both cases involved the activation of many local emergency and non-emergency organizations, and the participation of private citizens as well. In particular thousands of volunteers were used to assist in building a temporary river channel running through the heart of the downtown area so the excess water would not inundate large central parts of the city.

There was widespread emergent phenomena in this occasion, that is, new organizational arrangements and new organizational activities

came into being. Some took the form of new groupings which had not existed before the flood emergency. Others took the form of existing groups either organizing themselves in new ways and/or undertaking non-traditional tasks. Most took the form of new behaviors and activities within and between organizations.

For example, within the pre-planned Command Center, there emerged an informal grouping of experts drawn from different authority levels of various organizations who provided technical advice. No such grouping existed before the emergency, and it had not been pre-planned and only evolved after the flood threat had developed considerably. Basically, in the terminology of our typology of organized responses in disasters, there came into being a new group with a new structure and function (in some although not respects, this new grouping took the role and part of the pre-planned and existing Emergency Planning Board). How well this grouping operated is indicated by the fact that new disaster contingency plans developed in the city after the flood were partly modeled on what happened in the flood situation. Thus, what was an informal grouping of technical experts at the height of the flood, was formalized as a need to have pre-designated sets of experts available for different kinds of disasters in the future (e.g., one set of experts for chemical spills, another for earthquakes, etc.).

In addition to the emergence of new groupings, of which the example cited was simply the more prominent instance, some established organizations undertook new tasks or developed new structures (what in the DRC typology of organized response in disasters are called Type II groups, i.e., extending organizations and Type III groups, i.e., expanding organizations). For instance, the police and the Mormon Church (or more correctly the Church of the Latter-Day Saints, the LDS), expanded their tasks at different time periods preceding and during the flood disaster. They did things, on a fairly continuous and large scale, which were not part of their normal, everyday operational tasks. For example:

> The performance of volunteers in the flood fighting was exceptional and the major factor in being able to react quickly and effectively to the fast developing crisis at the end of May 1983. Where it became apparent...that marshalling the city and county forces to make State Street a river bed would not get the job done, a telephone call to the Mormon Church produced over 6,000 volunteers in little over an hour (Armstrong and Rosen, 1986: 23)

Similarly, there were structural alterations within and between some established organizations. For example, new lines of authority developed in some groups, and certain organizations assumed direction or control over particular operations of personnel from other organizations (e.g., public works department

personnel directed police personnel immediately involved in the construction of the new river channel).

But even more apparent than the new groupings and alterations of structures/functions in existing organizations, was the emergence of much new behavior on the part of almost every group that operated during the flood crisis. For example, many organizations had to change one or more of their normal operating procedures. For instance, the city purchasing department had to temporarily change its procedure for purchasing items; they developed one that was less time consuming and formally less bureaucratic. At the height of the emergency, some organizations not normally working on a shift basis, went to a 24 hour operation. For example, airport personnel were brought into the public works department that was working on 12 hour shifts with the city engineer being in charge of one shift and the public works director on the other shift. Such changes were not the result of prior planning (Armstrong and Rosen, 1986: 33). Also, lines of communication and authority were partly altered for the crisis duration in a number of organizations.

In some cases, everyday subordinate units and/or personnel, often because their knowledge or expertise was considered crucial for the situation, were temporarily allowed to make recommendations, issue orders, or even direct what in normal times were superordinate entities or officials. In addition, certain organizations developed and maintained relationships and interactions with other groups with which during normal times they had no contact. The city fire department, for instance, not only engaged in a non-traditional task of information gathering about flood conditions in the streets, and relayed what they knew and what was needed (e.g., sandbags at a particular intersection), back to different organizations at the command post, but also laid out the sandbags when they arrived at the designated place.

In addition, over a period of time, thousands of private citizens collectively participated in the flood fighting effort. (One non DRC estimate is that during the flooding period, volunteers provided 50,000 person days of effort in the city and twice that number in the remainder of the county, mostly in filling and placing 2.6 million sandbags; see Armstrong and Rosen, 1986: 12). Many were not individual volunteers in the usual sense of the term, but members of formal subunits within the LDS Church which were mobilized for the occasion. In that sense, they were, as some earlier DRC research found, a kind of organizational rather than individual volunteer (for a typology of different kinds of volunteers including the phenomena of organizational volunteers, see Dynes and Quarantelli, 1980). While such organizational volunteers were operating within a clearly defined and traditional pre-disaster organizational structure, much of what they actually did during the flood, represented new and novel behavior for them.

The many different kinds of emergence observed in Salt Lake City

were far less visible in Fort Wayne. It is not that there was no behavioral and group emergence during the flood in the latter situation; there was some. Even when there had been much preplanning, established organizations at the height of the crisis sometimes had to make minor modifications of their structures and/or activities. For example, the street department had to move its base of operation for the sandbagging effort from its own locale to the city Coliseum, an unplanned action. Women's auxiliary church groups, which had expected to supply food for volunteers, had to obtain far more supplies and use more personnel than they had anticipated. Particularly at the Coliseum, much of what went on had an emergent quality to it ranging from the teaching of volunteers on how to fill sandbags to the conducting of contests between teams of volunteers from different high schools.

There were even a few instances of what we discussed earlier as the emergence of Type IV and Type III organizations. For instance, some local unions got involved in food and money drives, shelter operations, and coordination of the cleanup (not traditional labor union tasks). One public shelter was opened, manned, and operated in a neighborhood community service center; mostly apart from the traditional Red Cross operations in this area. In the very early stages of the recovery period of the flood, there even emerged a new group concerned with the cleanup effort that was seen as eventually necessary.

Nonetheless, the general picture the DRC team obtained was of little emergence, certainly far less relatively than had been observed in Salt Lake City, but also in absolute terms. Even though as many as 30,000 volunteers were used to work on the dike holding the flood waters out of the city (see Phillips, 1986) groups and people very often did the traditional, the planned and the expected. As we shall discuss later, different prior disaster experiences and different kinds of planning seemed to account for what we found in these two flood disasters.

2. The five other field studies.

We shall now rather briefly summarize some of the emergent phenomena the DRC teams observed in the other field studies where emergence was consciously sought during the data gathering stage. As will be noted, the range found was from considerable emergence of different kinds to almost none at all.

In the New Orleans flood situation, the telephone system was completely disrupted for more than eight hours in the center of the city where most local emergency organizations had their main base or headquarters, while floods blocking traffic were occurring in different neighborhoods in the metropolitan area. In addition, at that time there was a relatively decentralized overall community disaster planning in New Orleans (e.g., separate Emergency Operations Centers), which suggested to us that there would be

problems of integrating overall interorganizational responses in this community crisis. We found that the occasion did generate some emergent behavior. For example, while disaster planning called for the local Red Cross chapter to open shelters, the local police department had to undertake some of this task because of the serious difficulties and delays the former organization had in contacting and mobilizing its own personnel responsible for shelter operations. On the other hand, the threat to the city never reached the point of necessitating quick and interorganizational interaction and coordination; thus, there was not, as there have been in other disasters studied by DRC, the emergence of some overall organizational coordinating group or set of officials coordinating polices of the involved agencies.

In the Coalinga, California earthquake there was both more and less emergence than might have been expected. The fires which developed in the aftermath of the quake led to greater participation in fire fighting activities beyond that which was usual even for a volunteer fire department as existed in Coalinga. Also, officials from five key emergency groups (three local and two from out of town) met in a totally unplanned fashion within an hour after impact, to discuss and assess the situation, and made key decisions such as where to establish a command post from where outside aid could be directed. In contradistinction to the immediate emergency time period, the later crisis phase did not provoke as much emergence as might have been expected given the substantially greater than typical convergence of outside groups on the stricken community. The tremendous unplanned convergence of outside groups was never coordinated, integrated or otherwise organized in any meaningful fashion, and it does not appear that there was very much, if any, emergence at the intergroup or organizational level to deal with the problem).

In the Washoe Valley landslide in Nevada, there was some ephemeral emergent behavior but no emergent groups. The organized response to the disaster was rather poorly coordinated, and there was a relatively high degree of convergence (e.g., eleven pre-existing search and rescue groups alone), along with very limited and by most criteria, poor organizational and community preimpact planning. However, once the slide was over and had destroyed seven homes and came close to impacting 35 others, the crisis was over. Thus, while in the words of one observer "they never got their act together", the responders to this disaster were able to afford the luxury of what in the DRC experience at that time of over two decades of field has to be classified at the organizational level as one of the least well handled disasters it had ever studied. If the disaster impact had been of even slightly more magnitude, some kind of emergence would almost seem to have been necessary.

The series of related tornadoes and associated floods which hit in and around Houston, Texas did generate both emergent behavior and emergent groups, although for the area as a whole, the impact was

a "marginal" disaster at best. In most of Houston itself the response was primarily to a moderate level emergency, but in surrounding Harris County certain localities suffered a disaster. What also stand out in this situation was the differential impact on different organizations. Some, such as the county health department with overall responsibilities for over 400 different water systems had to have some of their usual activities temporarily assumed by other groups, whereas other emergency relevant organizations had no disaster demands imposed upon them at all. Elsewhere in the area, a totally unplanned public shelter was set up and used by private citizens, even though a planned Red Cross shelter was opened not far away.

Finally, the flood in Jackson, Mississippi was particularly selected for field study as a possible extreme case of where perhaps no emergence of any consequence might be expected. The flood occasion we studied in the area was the last of a series of recurrent floods in the locality; in fact, there had been six floods forcing evacuations just since December 1982 (up to May 1983), and there had been floods in previous years, including the highest one in terms of flood stage just three years before. By the criteria used by disaster researchers, the area had a disaster flood subculture, that is, a traditional and institutionalized pattern of anticipating and preparing for floods (see Wenger, 1978 for a discussion of disaster subcultures). The greater part of the individual, organizational and community responses to the flood we studied did follow rather preplanned and expected paths. There was very little emergence of any kind, with the response pattern coming as close to an ideal case in the real world that DRC had ever encountered up to that time of non-emergence in a disaster situation with major consequences. The May flood studied forced 6,000 residents to evacuate and resulted in at least 24 million dollars worth of damage. To the extent there was any emergence, it was minor behavioral emergence in a few groups, but no new group emerged--which is what we had hypothesized before actually doing the field work.

GENERAL CONCLUSIONS

In our conclusions we want initially to point out what we consider the most important finding of our research. We went looking for emergent groups and found some. But somewhat unexpectedly we also found that in most of the organizations and groups that were not emergent, there was nonetheless considerable emergent phenomena. This suggests the need for a new typology of emergence.

Second, we want to note that given the limitations of our research, we are able only to suggest in a hypothetical way, what might lead to emergence in disasters. We will indicate some necessary as well as sufficient conditions, but much is still unclear.

1. A new typology of emergence.

Earlier we presented the original DRC fourfold typology of organized behavior in disasters. In our field research, we did find numerous instances of groups which could be categorized as falling in one of the four cells. In fact, the great majority of the groups we saw could be relatively easily identified as specified in the typology, as being established, extending, expanding or emergent groups.

However, there were many observations we made about the organized responses in disasters, which the old DRC typology did not capture well. For example, established groups often underwent no major alterations in their structures or functions but nonetheless exhibited some temporary or minor emergent qualities. For example, in the New Orleans flood situation, routines and disaster planning in many emergency organizations called for much intra and interorganizational communications to be conveyed by telephone. However, because of the situation in the city, such communication was hand carried--a procedure not planned for--and undertaken by personnel who had not either by traditions, routines, or plans, visualized playing the role of a message carrier. There was what we eventually decided to call quasi-emergence in group structure and/or function. Another example was where, although there was no prior planning for it, non-Coalinga based California Highway Patrol units took over patrolling major highways outside the city that normally was a Coalinga based unit task (Nigg and Mushkatel, 1984).

Similarly, in our field studied we noted organizations which carried out old functions or tasks and developed some new structure, and yet did not become an extending group as suggested by the initial DRC typology. The local U.S. Weather Service office in New Orleans, for example, when it lost its telephone lines found itself unable to issue weather bulletins, contact other weather station offices, and indirectly was initially unable to continue its warning functions for citizens. A local amateur radio club was brought into the situation and by utilizing a patchwork of radio groups was able to establish contact with the Weather Service Office in Baton Rouge. Essentially, a temporary but effective new social linkage or network was put in place. In more technical terms, we had what we have ended up calling structural emergence. Similarly, in Salt Lake City, a county agency had everyday responsibility for the large streams that ran through the city. But at the time of the disaster, there was a temporary agreement that if water in the conduits flooded out into the streets, it was the responsibility of the city (Armstrong and Rosen, 1986: 30).

Conversely, we also encountered in our field research, instance of where the group structure was in no way altered or changed, but where a new task was assumed. For instance, the police department in New Orleans opened up two public shelters, a task that routinely and by disaster planning, is usually carried out by the local Red Cross chapter. When the latter organization was unable to carry out this function, the police department opened up the shelters yet

did not run them. But in no way did the police department become an expanding organization in the sense suggested by the old typology. Instead, we had, in the terminology of our new formulation, task emergence. Similarly, in Salt Lake City, experts and equipment from the Weather Bureau, the Public Utilities Department and the Department of Public Works were used to produce a daily five day forecast of flows of the streams flowing through the city, enabling controlled discharges through various drainage systems. An informal group did not emerge, but there developed this informal understanding about who would handle this rather non-traditional task (Armstrong and Rosen, 1986: 22).

Finally, we did find instances of group emergence. Right after the earthquake emergency started there came into being a very temporary coordinating group in Coalinga which involved five key organizations. There was both a new structure and new function which did clearly emerge, although it took rather fleeting form. As in the old DRC typology, we found that in our newer formulation about emergence, we could continue to call this phenomena, emergent groups or group emergence. Similarly, in Salt Lake City, the Director of the county Public Works Department reported major organizational changes:

> An example was our planning department. We shut our planning department down and they became the volunteer coordinators to go out and contact church groups and civil groups. When they needed 500 volunteers, they worked out details with these groups. And they put the master planning file on the shelf for three weeks while they did this (Armstrong and Rosen, 1986: 31).

Depicted in a tabular fashion we can identify four types of emergent behavior. As briefly discussed above, we have:

STRUCTURES

FUNCTIONS or TASKS	Old	New
Old	Quasi-Emergent Behavior	Structural Emergence Behavior
New	Task Emergence Behavior	Group Emergence

In any given disaster situation, of course, all types of emergence may be simultaneously present as was the case in the Ft. Wayne and Salt Lake City occasions. On the basis of our research we could also hypothesize that in most disaster occasions, quasi-emergent behavior will appear most frequent and group emergence will be relatively rare. We found the former behavior present to some degree in every case we studied, whereas the latter phenomena only appeared in some instances. A reexamination of previously gathered DRC data alluded to earlier confirmed this impression. It also does appear that task emergence is probably more frequent than structural emergence, possibly reflecting the fact that social structure is less vulnerable to change than social task or function, as can be witnessed in many areas of social life quite distant from the disaster area.

To emphasize the importance of emergent behavior in groups that operate in disasters, is not to deny that new groups which emerge in disasters can also be very important. As said earlier, major and catastrophic disastrous occasions do generate emergent groups (this has been consistently documented through 30 years of DRC field work starting with the Alaskan earthquake and Topeka tornado disasters of the 1960s, the Wilkes-Barre flood and Xenia tornado disasters of the 1970s, Hurricane Hugo and the Loma Prieta earthquake disasters of the 1980s, the American midwest floods and the Northridge earthquake of the early 1990s to cite some examples studied by DRC. In such major and often catastrophic situations, the emergent groups are frequently crucial, for instance, in undertaking tasks or providing structures which cannot be done by existing groups even if they expand their functions or extend their structures.

Consequently, we took the findings from earlier DRC studies on emergence (e.g., Yutzy, 1964; Quarantelli and Dynes, 1967; Dynes, 1968; Dynes and Quarantelli, 1968; Adams, 1969, Anderson, 1969; Parr, 1970; Stallings, 1970; Brouillette and Quarantelli, 1971; Weller and Quarantelli, 1973; Ross and Smith, 1974, Bardo, 1978; Forrest, 1979;, Dynes and Aguirre, 1979; Ross, 1980) and combined them with the result from the work summarized in this paper, and have concluded that organized responses to disasters can be visualized as taking one of the following forms:

1. Established groups carrying out old tasks (old DRC Typology Type I)
2. Established groups carrying out old tasks but with some degree of minor behavioral emergence, either structurally or functionally, in their activities;
3. Established groups carrying out new tasks and showing behavioral task emergence;
4. Established groups carrying out old tasks but showing behavior structural emergence;
5. Extending groups carrying out old tasks but with new structures (old DRC Typology Type II);

6. Expanding groups carrying out new tasks but with old structures (old DRC Typology Type III); and
7. Emergent groups carrying out new tasks with new structures (old DRC Typology Type IV).

Even in the late 1970s, Bardo (1978) and Stallings (1978) in earlier analyses involving reexamination of previously gathered DRC data, had indicated that the initial four fold DRC typology of organized responses to disasters, was too limited an approach. Our more recent empirically based work confirms their suggestions that an expansion of the typology was needed. The newer formulation with its emphasis on minor behavioral as well as major structural and functional emergence, in addition to group emergence, does seem to more adequately capture social reality more than the original DRC fourfold typology of different groups. It is also consistent with what Shibutani pointed out long ago, namely that:

> if the distinctive feature of a social group is the capacity of the participants for joint activity, this suggests that a fruitful point of departure for the study of groups is the analysis of <u>action</u> rather than <u>structure</u> (1961: 34).

2. Factors involved in emergence.

Defining or identifying the characteristics of a phenomena is of course simply a necessary but only preliminary step to answering a more important question: What conditions account for the phenomena observed? In our particular research, the basic question therefore is what are the conditions which are responsible for emergence at times of disasters and the different forms (i.e., behaviors and groups) that the emergence takes? Although our study was mostly focused on ascertaining the characteristics of emergence, we would like to advance a few tentative ideas about the conditions which might be involved. For purposes of exposition, we will advance four general hypotheses and state them in an unqualified way.

> (1) If a crisis occasion is perceived as requiring action to avoid further problems, there will be an effort to act.

This is consistent with the often expressed view in the disaster research literature that if something needs to be done especially at the height of a crisis, people and organizations will attempt to do something. If traditional ways of acting will not do, an effort will be made to develop new ways. Thus, if a police department cannot handle problems by the ways they usually employ, the organization will structurally reorganized itself it in various ways (e.g., calling in all shifts, mobilizing reserves, deputizing civilians, etc.). Also, if non-traditional problems develop, an effort will be made to deal with them. Thus, if an impacted

neighborhood finds itself faced with the possibility that many injured may be trapped underneath debris, the civilians in the area will informally organize themselves into teams to engage in a very non-routine task, the search and rescue of victims. The attempts, whether by organizations and/or individuals, may not be very effective and/or efficient, but there will be an effort (actually they are more effective than might be expected, although usually not much efficiency is achieved).

Overall then, it could be said that a necessary condition for emergence is a perceived need to act on urgent matters (e.g., this seemed lacking in the Washoe Valley mudslide disaster). There almost never is any perceived social pressure to restore, for example, disrupted recreational or entertainment activities during a crisis. Instead action is initiated by the perceived need to act on urgent matters, such as saving lives or preventing major property destruction.

> (2) While a perceived need for action is a necessary condition, there are at least three sufficient conditions for emergence.

The three sufficient conditions are a supportive social climate, existing precrisis social relationships, and particular necessary resources. The social climate includes shared norms, values and beliefs of the participants in the situation which somehow indicates that collective action should be taken. Thus, it is not surprising that when a Greek Orthodox church was threatened in the Salt Lake City flood, the entire congregation massively turned out to help build a protective sandbag barrier around the building (Armstrong and Rosen, 1986: 21).

Facilitating social relationships are familiar ties that preexist in the situation. For example, in the Salt Lake City situation it was written that getting volunteers was facilitated by calling upon the Mormon Church:

> As over 60 percent of the valley residents were members of the Mormon Church, and as the divisions of the church called wards were essentially neighborhood organizations, this approach was effective. Not only did members of the church respond, but their non-member neighbors did also. As one woman stated; "I'm not a member of the Mormon Church, but I sure know who my neighborhood bishop is". (Armstrong and Rosen, 1986: 23)

Resources has to do not only with material things and people, but also relevant knowledge. Thus, emergency organizations may perceive that they should move immediately to deal with a toxic chemical threat, but have no information on the actual nature of

the threat, or if it is known, what concrete measures should be taken (see Quarantelli, 1984b, for examples of this).

Here again, our general hypotheses about sufficient conditions is consistent with findings from other disaster research. Individuals and groups may perceive that something should be done, but because of lack of required knowledge, or the absence of social ties or crucial resources may be unable to act. Threatened persons and households may believe they should quickly evacuate, but lack the boats necessary to get out of a flooded neighborhood. Put another way, a perceived need to act may not co-exist with the possibility of acting. Thus, the possibility of initiating new behaviors or developing news groups is dependent on whether the existing social context can provide the means for acting in ways different from the old. Conversely, if there is a perceived need and a facilitating social context emergence can occur (e.g., in Coalinga, the fire department needed far more "volunteers" than usual to help fight a major fire, and was able to use civilians that were present).

(3) Prior planning can preclude dysfunctional or unnecessary emergence.

Relevant to this point is the need of not automatically assuming that emergent phenomena is necessarily dysfunctional, bad, or otherwise inappropriate. A fair amount of disaster research supports this notion. Yet, there is a strong tendency among disaster planners and managers to think that because they have not planned for or are not controlling some behaviors and groups in a disaster situation, that it cannot be good. This is seldom the case. In many occasions, whether it is the individual or organizational emergence, the new behavior or group may represent the most effective way of coping with the problem. This is not to say that emergence always represents the best solution, but emergence is a manifestation of an effort to deal with a problem.

Thus, without assuming that emergent behavior or groups are necessarily bad in a disaster response, it does appear that prior planning can preclude or discourage dysfunctional or unnecessary emergence. In some ways this is simply saying that if prior planning is such as to generate certain kinds of crisis time responses, there will be no need for such responses to emerge more spontaneously and informally. On the other hand, if something is prepared ahead of time, it should in most cases, be a more efficient if not more effective way or responding than where the response is created as the crisis is developing. (As an example, the more extensive and longer planning that went into preparing for the Ft. Wayne flood allowed a more efficient managing of the response than what happened in Salt Lake City where because of relatively lesser planning, more "ad hocing" and "ad libbing" had to be undertaken as the threat developed).

(4) Prior disaster experiences (or certain kinds of

preplanning) will make emergence at a crisis time less likely.

As just said, a high degree of preparedness can discourage some emergence. While research is clear on the fact that the experience of a disaster does not automatically lead to better planning for future disastrous occasions (Anderson, 1969), experience plus other conditions can lead to the taking of preparedness measures (Weller, 1974: Wright, 1976). Unfortunately, too often it is assumed that as a result of a disaster experience, the next emergency will be managed in a better way. This is not necessarily true unless the appropriate lessons from the experience are explicitly incorporated into the planning process (see Quarantelli, 1983). In fact, sometimes "wrong" or "incorrect" lessons may be learned, as implied by some students of the Exxon Valdez massive oil spill (see e.g., Harrald, Cohn and Wallace, 1992). On the other hand, it was not crucial that Jackson, Mississippi had had many floods, but rather that the community had undertaken such extensive and proper preparedness a number of times that when the last flood occurred, most everything had been foreseen.

Actually, certain kinds of emergence can be preplanned, at least in the sense of anticipating the phenomena and creating conditions for its possible appearance. As said earlier, a facilitating social context is required as well as a perceived need to act for emergence to occur. Such a context is something disaster planners could often prepare considerably ahead of any disaster impact. In some respect our view here comes close to a similar idea expressed by both Drabek (1987) and Kreps (1991). On the basis of their research they argue that much improvisation is always necessary in organizational responses to crises because every disaster presents particular combinations of demands and problems. Given this, they imply that crisis managers might welcome, for example, a "loose coupling" between their organizations in a disaster response, because such looseness is actually functional, at least for effectiveness of response. Our research has come to the same general conclusion, but with the additional emphasis that disaster preparedness itself could build in and allow for improvisation or emergence. It makes little sense to plan, to conduct exercises or otherwise carry out preparedness measures as if there was only one standardize way to do such matters, when there is prior acceptance of the probability and usefulness of emergence in the crisis response. Thus, if there is going to be emergence in responses to disasters, there should also be a degree of emergence in the preparedness process itself. Put another way, if responders are to improve in responding, they must practice some improvising in their preparedness activities.

SOME CONCLUDING OBSERVATIONS

In conclusion, the studies done so far suggest that future research might fruitfully expand in three different directions.

(1) Almost all the examples cited in this article are from the United States. But there is no reason to think that the emergent phenomena discussed is specific or unique only to American society. Crisis time emergent groups, for example, have been studied in Australia, Mexico, Canada and Sweden (see Wettenhall, 1979; Dynes, Quarantelli and Wenger, 1990; Scanlon and Hiscott, 1994; Neal, 1985 respectively). However, there have been anecdotal observations that they appear less frequently in disasters, for instance, in Japan or France. This suggests the need for cross-societal studies on the topic to see if the findings obtained so far are societally or culturally limited, and if so, to what degree and in ways.

(2) In addition, it would be important in the future to do studies outside of disaster crisis times, and to establish similarities and differences in the characteristics of and the conditions for emergence in all the different situations. This would include researching the phenomena in both non-crisis phases of disasters a well as in conflict settings. As to the former, we have already alluded to the DRC study of emergent citizens groups in the mitigation and recovery phases of disaster planning (see previous references; see also Walsh, 1988, for citizen groups in the wake of the Three Mile Island nuclear disaster). In addition, in this larger context, Drabek (1987: 268-274) has advanced some rather innovative theoretical ideas and a new typology of emergent systems. But only a start in this kind of systematic study has occurred. Also needed is research on emergence in conflict situations such as riots/civil disturbances and civil strife situations such as exist in present day Bosnia. A few studies have been done on emergence in riots (e.g., Anderson, Dynes and Quarantelli, 1973) and there are newspaper accounts which describe in detail and considerable and great range of emergence in Lebanon during the height of the civil strife in that country (see, e.g., Hijazi, 1990: 3). But many depth studies have yet to be done. Moreover, systematic comparative work of any kind, empirical or theoretical, is almost nonexistent (but see Quarantelli, 1993).

(3) Finally, the study of emergence has articulated well with ideas from the sociological subfield of collective behavior. As others have documented (see Wenger, 1987) disaster research in general, and the study of emergence in particular, has since work started both been informed by collective behavior ideas as well as informing the area of collective behavior. Nevertheless, even a stronger convergence could be made. For instance, little use in the study of emergent groups has been made of the concept of ephemeral roles as developed by Zurcher (1968). Oddly enough, the concept of rumor as developed by Shibutani (1966) has almost never been used in its technical sense in the study of disaster emergence. Use of these and similar concepts would materially help in the study of crisis time emergence.

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