

University of Delaware
Disaster Research Center

PRELIMINARY PAPER
#277

INDIVIDUAL AND ORGANIZATIONAL RESPONSE
TO NATURAL DISASTERS AND OTHER CRISIS
EVENTS: THE CONTINUING VALUE OF THE DRC
TYPOLOGY

Gary R. Webb

1999

**Individual and Organizational Response to Natural Disasters and Other
Crisis Events: The Continuing Value of the DRC Typology**

Gary R. Webb
Disaster Research Center
University of Delaware
Newark, DE 19716

Paper presented at the annual meeting of the Eastern Sociological Society, March 4-7, 1999,
Boston, Massachusetts.

This research was supported in part by a grant from the National Science Foundation (CMS-9422639). However, the opinions and findings presented in the paper are those of the author and do not necessarily reflect the views of the National Science Foundation. I owe a special thanks to Gary A. Kreps and Susan L. Bosworth for their assistance in developing the ideas for this paper. And I would like to thank Lisa Marinelli, Jennifer McCloskey, Megan McMichael, and James Noon for their hard work in producing the data.

Introduction

This paper is being written for a special session honoring Russell R. Dynes and E.L. Quarantelli, two distinguished scholars whose intellectual contributions have profoundly shaped the area known as the sociology of disasters. With the theme of honoring their contributions in mind, I have two objectives in this paper: first, to use one facet of my own research as a specific example of how Dynes and Quarantelli's early contributions continue to be useful in framing research questions today; and second, to talk more generally about what I see as some of their more important lasting contributions to the field of disaster research and the broader discipline of sociology. My treatment of these two topics will necessarily be selective and somewhat brief, as it would be impossible to cover in one short paper the full range of impacts these two prolific scholars have had on the development of the field¹. Nevertheless, it is my hope that these remarks will in some small way demonstrate the continuing value of Dynes and Quarantelli's lifelong work.

Old Ideas, New Questions

In developing ideas for this paper, my goal was to identify specific, concrete examples of how Dynes and Quarantelli's ideas have influenced my own research. Fortunately, my task was made easy because my dissertation used DRC archival data and both Dynes and Quarantelli served on my committee. For the purposes of this paper, then, I will focus on the relevance of the DRC typology to my recent research. In particular, I will show how I used the DRC typology to develop hypotheses and how in turn my research might inform future applications of the typology. Therefore,

¹ Indeed, a complete treatment of the contributions of Dynes and Quarantelli to sociology and disaster research could fill volumes. As one recent example, Dynes and Tierney (1994) edited an entire volume honoring Quarantelli's contributions to the fields of collective behavior and disaster research.

it will be important to briefly describe the typology and provide some background on my own research.

Background of the DRC Typology Dynes and Quarantelli co-founded the Disaster Research Center in 1963 at Ohio State University (and later moved it to the University of Delaware in 1985). Unlike previous researchers who focused primarily on *individual* victims, Dynes and Quarantelli made a decision at that time to focus on *organizational* responses to crisis events² (for a review of the earlier studies see Fritz (1961) and for useful historical descriptions of the development of DRC see Quarantelli (1987; 1994) and Kreps (1981)). This shift from the individual to the organizational level of analysis meant that they would have to search the literature on complex organizations for a conceptual scheme to understand how organizations function under stress. At that time, organizations were largely characterized in a Weberian sense as large, rigid, and inflexible bureaucracies.

DRC's early field studies made it abundantly clear, however, that these characterizations did not adequately capture the adaptive qualities of organizations in disaster situations. Given the fluid and sometimes emergent properties of organizations under stress, Dynes and Quarantelli (1968a; Weller and Quarantelli 1973) thus proposed that a full understanding of organizational response to disasters requires the convergence of organizational and collective behavior theories. This led, then,

² Since its inception DRC has conducted several hundred field studies of organizational and community preparedness for, response to, and recovery from natural disasters, technological emergencies, and civil disturbances. (See Quarantelli (1997) for a good descriptions of the methods used in these field studies and their relationship to the methods used in some of the earlier disaster studies, namely those done at the National Opinion Research Center).

to the development of the DRC typology³ (Dynes 1970), a simple four-fold property space that continues to be a valuable conceptual tool in the field of disaster research (see Figure 1).

[Figure 1 about here]

As Figure 1 shows, the DRC typology classifies organizations responding to disasters along two dimensions: tasks and structure. Tasks are characterized as either regular or nonregular and structure is characterized as old or new, resulting in four types of organized responses to disasters. Type I, or established organizations, rely on an existing structure and carry out regular tasks during disasters. These organizations, such as police and fire departments, are expected to respond to disasters. Type II, or expanding organizations, are also expected to be involved in disasters--they carry out regular tasks-- but in so doing they rely on new structural arrangements. For example a Red Cross or Salvation Army chapter is normally staffed by only a small cadre of professional workers, but following a disaster the structure expands with formally trained volunteers. Type III, or extending organizations, are not expected to respond to disasters. They are characterized by an existing structure, but during disasters they perform nonregular tasks. For example, a construction company might be involved in clearing debris to assist with rescue operations. Finally, Type IV, or emergent organizations, involve a new structure and obviously nonregular tasks. Simply put, these organizations do not exist prior to the disaster event. The classic example of an emergent organized response is a spontaneously formed search and rescue group.

³ The DRC typology provides a framework that simultaneously captures organizational maintenance and emergence. Nevertheless, some DRC researchers suggest that the typology is still too limiting an approach to adequately describe organizational response to disaster (Stallings 1978). In a recent paper on emergent organizations, for example, Quarantelli (1996) expands the typology to allow for, among other things, the possibility of behavioral emergence in established organizations.

Background of the Archival Research Program The DRC typology addresses the basic sociological issue of structural maintenance and emergence. In particular, it provides a parsimonious conceptual tool that captures the various ways organizations maintain or alter their tasks and/or structures in response to disasters. My own research, which is part of a long-standing research program (see Kreps 1989; Kreps and Bosworth et al. 1994; and Webb 1998) using DRC archival data⁴, also attempts to describe and explain social processes of stability and change in extreme situations. Whereas the DRC typology uses the concept of organization to address those processes, our most recent work uses the concept of role to capture the degree to which predisaster social structures are maintained or changed during the emergency period of disaster events⁵.

The role enactment framework we use in our work to assess the degree of structural stability and change during the emergency period is presented in Figure 2. As shown, we look at three dimensions of role enactment to determine the degree to which predisaster role dynamics are maintained or altered in response to crisis events. Status-role nexus measures the consistency or inconsistency in the allocation of roles from pre- to postdisaster time periods (role allocation). Role linkages refer to the continuity or discontinuity of incumbent role sets from pre- to postdisaster time periods (role complementarity). And role performance refers to the level of improvising in the actual

⁴ The DRC archives contain approximately 3000 transcribed and 5000-6000 untranscribed tape-recorded interviews of key participants that have been conducted in field studies by the Center since its founding in 1963. In previous phases of the archival research program, Kreps, Bosworth, and their colleagues have completed a variety of analyses of about 1600 of the transcribed interviews. The remaining archives on which the analyses presented in this paper are based are described in detail below.

⁵ During earlier phases of the research program, Kreps developed a structural code that, like the DRC typology, is aimed at capturing the processual qualities of organizations responding to disasters. (For detailed accounts of the structural code see Kreps 1978; 1984; 1985; 1991; 1994).

performance of postdisaster roles (role differentiation).

[Figure 2 about here]

In this conceptual scheme every role enactment involves expectational, relational, and behavioral dimensions. And these three dimensions represent alternative ways of assessing the degree to which postdisaster role dynamics reflect or depart from the predisaster time period. Accordingly, the role enactment framework poses three related questions: (1) do key respondents to disasters do what is expected of them? (2) do they maintain routine contacts? and (3) do they perform their duties in conventional ways?

To answer these questions, we develop detailed descriptions of individual role enactments from transcribed interviews contained in the DRC archives. Table 1 provides a detailed summary of the archival materials we used in our most recent phase of data production (recall from footnote 4 that about 1600 of the approximately 3000 transcribed interviews have been analyzed in previous phases of the research program). From the remaining archival data, we generated a sample (N=304) consisting of role enactments from natural disasters (n=172), technological emergencies (n=73), and civil disturbances (n=59).

[Table 1 about here]

In developing descriptions of our cases we identified the specific *behavioral components*--various spatially and temporally discrete activities enacted toward a common objective (role)⁶--of key participants' role enactments. This allowed us to then create proportional measures of change

⁶ For example, a fire engineer in a fire department company might enact a role that involves three behavioral components: (1) driving the fire engine to and from a riot scene; (2) operating the engine's water pump once at the scene; and (3) operating hand lines with other crew members.

in the three dimensions of role enactment during the emergency period⁷. For status-role nexus, this meant determining which components were consistent with predisaster occupational statuses and which were not. For role linkages, it meant determining which of the respondents' contacts during the emergency period were continuous (routine) and which were not (based on the predisaster occupational statuses of respondents and links). And for role performance, this meant determining which behavioral components were performed in a conventional manner and which were improvised.

As Table 2 shows, we observed a high degree of stability in role dynamics from the pre- to postdisaster time periods. For example, for the entire sample the average proportion of inconsistent respondent behavioral components is about 18 percent. Similarly, the average proportion of discontinuous role linkages is only about 15 percent. And the average proportion of improvised behavioral components for the entire sample is about 25 percent. These numbers suggest that there is a substantial degree of stability in the expectational, relational, and behavioral dimensions of role enactment even under stressful conditions. However, changes in role dynamics do sometimes occur, and when they do certain individual, organizational, and event characteristics are particularly useful for predicting those changes.

[Table 2 about here]

The DRC Typology Revisited Let us return now to the DRC typology, which, based on the above description, should be a useful conceptual tool for predicting changes in role dynamics during the emergency period. Given its distinction between those organizations expected to respond to

⁷ Accordingly, higher percentages reveal a strain toward structural change while lower percentages point more to structural stability (i.e., less change in role dynamics).

disasters (Types I and II) and those not expected to respond (Types III and IV)⁸, the typology suggests the following research hypotheses:

- H₁ There will be higher levels of change in the first dimension of role enactment (inconsistent status-role nexus) in extending/emergent organized responses.
- H₂ There will be higher levels of change in the second dimension of role enactment (discontinuous role linkages) in extending/emergent organized responses.
- H₃ There will be higher levels of change in the third dimension of role enactment (improvised role performances) in extending/emergent organized responses.

As shown in Table 3, our data confirm two of the hypotheses regarding organizational type, but there is one surprise. As suggested, respondents enacting roles in extending/emergent organizations (those not expected to be involved) have significantly higher degrees of inconsistency in the status-role nexus (mean=.38) than respondents in established/expanding organizations (those expected to be involved) (mean=.09). Similarly, respondents in extending/emergent organizations have significantly higher proportions of discontinuous role linkages (mean=.27) than those in established/expanding organizations (mean=.09). Surprisingly, though, our data fail to confirm the third hypothesis that respondents in extending/emergent organizations improvise their role performances at significantly higher levels than those in established/expanding organizations (because the former are not expected to enact a disaster response).

[Table 3 about here]

⁸ For purposes of the following statistical analyses, the four-fold DRC typology will be collapsed into a dichotomous variable--established/expanding (n=204) and extending/emergent (n=96)--based on the distinction between expected and non-expected involvement. In some ways this is a statistical decision based on the distribution of cases on the organizational type variable; however, it is conceptually consistent with the four-fold model. T-tests are used to compare respondents enacting roles in established/expanding organizations to those in extending/emergent organizations in terms of their mean levels of change on the three dimensions of role enactment

To further explore the relationship (or fascinating lack thereof) between organizational type and behavioral improvisation, we removed the civil disturbance cases (a decision which will be explained below) and ran the same statistical tests on the subsample (n=241) of natural disaster and technological emergency cases. Under this modified scenario we do in fact observe a statistically significant relationship between organizational type and level of behavioral improvising, and the relationship is in the expected direction. In the subsample of natural and technological disasters, respondents enacting roles in extending/emergent organized responses improvise their role performances at significantly higher levels (mean=.25) than those in established/expanding organizations (mean=.18).

Our decision to remove the civil disturbance cases from the analysis of the third dimension of role enactment was based on an assertion made by Dynes and Quarantelli long ago (1968b; Quarantelli and Dynes 1977) that social responses--at the individual, organizational, and community levels--to civil disturbances are qualitatively different than those to natural and technological disasters. In making that assertion they distinguished between *dissensus* crises (i.e., civil disturbances) that involve high degrees of community conflict and *consensus* crises (i.e., natural and technological disasters) that are typically characterized by an almost complete lack of conflict (at least during the immediate emergency period).

Building on that early distinction, as recently as last year Quarantelli (1998) has questioned whether conflict situations like civil disturbances should be considered under the same conceptual rubric as natural and technological disasters⁹. Our data surely do not offer a definitive answer to this

⁹ Although the issue will not be addressed at length here, our data also point to some interesting differences between natural disasters and technological emergencies, which raise some questions about whether these two types of events should be conceptually collapsed.

important question, but they do point to some interesting issues that should be explored further. In particular, we have produced some evidence to suggest that during the emergency period of civil disturbances there may be more improvising that occurs in established/expanding organizations (those expected to be involved) than in extending/emergent organizations which are not expected to be involved in responding to a crisis¹⁰. This clearly implies that the DRC typology--which continues to be extremely valuable in the field of disaster research--needs to be explored further in a variety of crisis (and perhaps "normal") situations. The fact that a simple four-fold property space developed three decades ago still produces such fascinating subtleties attests to the magnitude of its contribution to the field.

Lasting Contributions: Some Personal Observations

In the previous section I presented some of my own research to illustrate how Dynes and Quarantelli's early intellectual contributions are still useful for developing research questions today. Specifically, the DRC typology was shown to be a valuable conceptual tool for understanding structural maintenance and emergence in extreme situations. And Dynes and Quarantelli's distinction between consensus and dissensus crisis events was shown to be an important contextual factor to consider in future applications of the typology. In this section I want to shift from talking about specific empirical findings to a broader discussion of Dynes and Quarantelli's lasting contributions to the field of disaster research and the discipline of sociology.

¹⁰ For example, the bivariate correlation coefficient between our DRC typology measure (established/expanding versus extending/emergent) and the behavioral improvisation measure (proportion of improvised behavioral components) for the subsample of civil disturbance cases (n=59) is -.25 (p=.056), indicating higher levels of improvising in established/expanding organizations. While not definitive, this preliminary finding raises some interesting conceptual issues and has clear implications for future research.

The discussion in this section and the points I will raise are based for the most part on interviews I conducted with Dynes and Quarantelli during the winter of 1997-98. Those interviews were conducted as part of Quarantelli's effort to establish an oral history of the field of disaster research¹¹. The interviews are filled with intriguing details of their professional and personal lives, and they will surely serve as a valuable resource for some future scholar interested in reconstructing the development of disaster research. For the purposes of this discussion, however, I will limit my observations to what I think are three of Dynes and Quarantelli's most important lasting contributions.

First, their careers offer valuable lessons to anyone interested in creating and/or running a university-based research center. DRC--which is one of the oldest, continuously-funded social science research organizations in the U.S.--has now been in existence for more than thirty-five years, and it shows no signs of decline. It is my impression that there are two important factors (among many) that have largely contributed to the Center's success: (1) since its inception the Center has emphasized graduate student training and therefore relied heavily on students for doing much of the work; and (2) DRC research projects often push the boundaries of the field by asking questions which have largely been ignored. This dual emphasis on graduate training and novelty in research design was central to DRC's development, and it will likely continue to play a crucial role in the

¹¹ As part of the oral history of disaster research project, Quarantelli has interviewed several key researchers and representatives from funding agencies, documenting their respective roles in the development of the field. Quarantelli asked me to interview himself and Dynes, and I was privileged to do so. Taken together the interviews fill more than twenty hours of cassette tapes.

Center's future development¹².

Another lasting contribution of Dynes and Quarantelli has been their awareness of and emphasis upon the intellectual tradition and community of scholars that make up the field of disaster research. Although their research often pushes the boundaries of the field, Dynes and Quarantelli have always been aware of and built upon what has already been done, and they have shown others the value of doing that¹³. In stressing the intellectual tradition of the field, they have also made strong efforts to create a genuine international community of scholars, and they approach everything they do with that community in mind¹⁴. Given current trends toward a globalized economy and the expansion of democratic forms of government, the future development of the field of disaster research will increasingly depend on the integration of this intellectual community.

To conclude this section, I want to mention here what I think has been Dynes and Quarantelli's lasting contribution to the broader discipline of sociology. Most importantly, they have shown us that social structure--the core concept of our discipline--can be empirically studied and that disasters are strategic sites for that kind of research. Through their research they have also shown us that structure has both stable and emergent qualities and the conceptual schemes we develop must

¹² Hundreds of graduate students (mostly from sociology but in other disciplines as well) have been trained at DRC and many of them have stayed in the field of disaster research. As of this writing, thirty-three doctoral dissertations have been produced by graduate students at the Center.

¹³ For example, in a foreword to a recent book by Kreps and Bosworth et al. (1994: 14) Dynes and Quarantelli write about the book: "Like all good research, he [Kreps] builds on the efforts of past researchers. The importance of the book is not avoiding the drama but in paying attention to the significant details."

¹⁴ For example, in his recent book, What is a Disaster? (1998), Quarantelli invited twelve researchers from six different countries to offer their thoughts on how the concept of disaster should be defined for research purposes.

account for those dual qualities. This basic dualism dates back to the origins of the discipline when Comte spoke of social statics and dynamics. And that is why the field of disaster research must continue to be a fundamentally sociological enterprise.

Conclusion

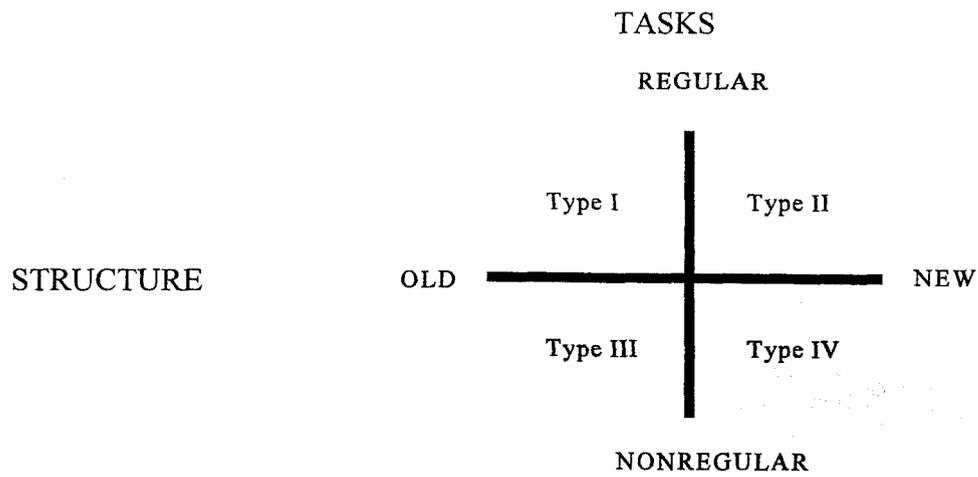
In this paper I presented some of my own recent research to demonstrate the continuing value of some of the early ideas of Russell R. Dynes and E.L. Quarantelli. Specifically, I talked about the relevance of the DRC typology to my own work in terms of understanding structural stability and change in extreme situations. And I revisited the distinction between consensus and dissensus crisis events, highlighting it as an important contextual factor for understanding social structure under stress. Perhaps the best way to end this paper is with a quote from the preface of Gary Kreps and Susan Bosworth's (1994: 15-16) recent book where they pay tribute to Dynes and Quarantelli: "When the history of disaster research is written, their contributions to the specialty, the discipline of sociology, and the emergency management profession will be among the most important."

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Figure 1 Disaster Research Center Typology of Organized Responses to Disaster (Adapted from Dynes 1970)



- Type I: Established organized response
 - Type II: Expanding organized response
 - Type III: Extending organized response
 - Type IV: Emergent organized response
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Figure 2 Three Dimensions of Role Enactment (Adapted from Kreps and Bosworth, et al. 1994)

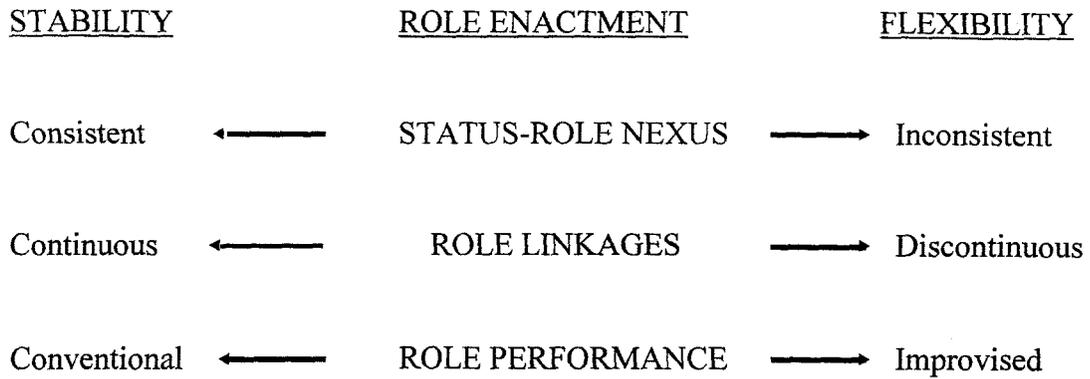


Table 1 Remaining Disaster Research Center Archives

	<u>Type of Disaster Event</u>			
	Natural	Civil Disturbance	Other	Total
Number of events studied by DRC	45	13	19	77
Number of DRC interviews	589	310	222	1121
Number of events sampled	20	5	12	37
Completed cases of role enactment	172	59	73	304

Table 2 Measurement of Three Dimensions of Role Enactment

STATUS-ROLE NEXUS	Proportion of inconsistent behavioral components Mean=.183 st.dev.=.298
ROLE LINKAGES	Proportion of discontinuous respondent role links Mean=.151 st.dev.=.229
ROLE PERFORMANCE	Proportion of improvised behavioral components Mean=.251 st.dev.=.284

Table 3 Means Comparison (T-test) of Three Dimensions of Role Enactment by Organizational Type (standard deviations in parentheses)

<u>Dimension</u>	<u>Established/Expanding</u>	<u>Extending/Emergent</u>
Status-role nexus	.09 (.20) n=204	.38 (.37)*** n=96
Role linkages	.09 (.17) n=197	.27 (.27)*** n=92
Role performance	.24 (.30) n=204	.27 (.27) n=96

*p<.05 **p<.01 ***p<.001