University of Delaware
Disaster Reesearch Center

ARTICLE
#170

PEOPLE'S REACTIONS TO EMERGENCY WARNINGS

E.L. Quarantelli

Reprinted from Transcript of the Dam Safety Conference, Charleston West Virginia August 23-24, 1983(Charleston, West Virginia: Department of Natural Resources, 1984): 177-187.

Article #13a

TRANSCRIPT OF THE DAM SAFETY CONFERENCE

AUGUST 23 - 24, 1983

University of Charleston
Charleston, West Virginia

PRESENTED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY

in cooperation with

THE WEST VIRGINIA DEPARTMENT OF NATURAL RESOURCES

article #1

TRANSCRIPT OF THE DAM SAFETY CONFERENCE

AUGUST 23 - 24, 1983

University of Charleston
Charleston, West Virginia

PRESENTED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY

in cooperation with

THE WEST VIRGINIA DEPARTMENT OF NATURAL RESOURCES

Copies of this transcript may be obtained from the following sources:

Thomas Majusiak
Federal Emergency Management Agency
6th and Walnut Streets
Philadelphia, Pennsylvania 19106

OR

Brian Long
Department of Natural Resources
1800 Washington Street East
Charleston, West Virginia 25305

Mr. Quarantelli:

People's Reactions to Emergency Warnings

One of the earliest research topics in the disaster area was the issuance of emergency warnings and the reactions to them. This is understandable. If persons can be warned of a threat, they can take preventive, mitigatory, precautionary, and protective measures, including evacuating themselves out of an endangered area. Warnings can obviously be useful it not necessary for adaptive behavior to environmental changes--natural or manmade--which put life, property, group routines, and the ecological balance in peril. It is not therefore surprising that when social and behavioral scientists started to do research on disasters about 30 years ago, many of the studies focused on the question of disaster warnings and reactions of potential victims to them. This interest has persisted over the years.

Thus, over a period of several decades now, substantial and systematic knowledge has been accumulated about the warning process. Organizational monitoring of danger cues, mass media and other group communications about threats, as well as reactions of individuals to information about possible disasters have been examined. Out of this work has developed the idea that it is most useful to conceive warning as a general social system consisting of three basic elements or activities, that is, assessment, dissemination, and response. Assessment involves those organizational activities taking place from the time of the detection of the environmental hazard to the point at which some communication means are used to convey a message to the threatened population of the probable impact of the disaster agent. In most societies this is usually the strongest part of the warning system. The issuance and transmission of such a message is the dissemination phase of the warning process. This has been the least effective aspect of most warning systems. Response is the specific adjustive behavior which is part of the general reaction pattern to indications of danger, including warning messages. This aspect is, of course, the most important aspect of the total warning system since the major effectiveness of warning is directly dependent on the evoked response.

In this paper we primarily summarize and highlight the major findings regarding reactions of human beings to disaster warnings of an immediate event. Response in this approach is viewed more narrowly as the adjustive behavioral outcome of the reaction pattern. Reaction is the broader set of activities involved in exposure to and use of disseminated warning messages, as well as other observations regarding a dangerous situation.

Our focus is on individual reactions to relatively short-term warnings as might be issued in a sudden emergency generated by a flood from a dam collapse or sudden river rising, hurricane-typhoon and cyclone, tsunamis or so called tidal wave, transportation accident involving fire or explosion of dangerous chemicals, or a major technological accident in a nuclear plant. We do not concern ourselves with longer term messages which might warn about slowly developing disasters such as might be involved in famines, droughts, most epidemics, diffuse toxic poisonings, or even long range earthquake predictions. More than logic is involved in distinguishing

between warnings in short run and long run situations. Empirically, research studies show there are some qualitative differences in how people react to warnings in the two kinds of situations (e.g., warnings are less recognized, believed, and responded to in the long run situations).

While not all questions about reactions to warnings have been answered, disaster researchers appear to agree about the general perspective which ought to be taken, and about many specifics of the reaction pattern. There is a high degree of consensus that the warning process must be approached differently than is commonly and mistakenly thought or sometimes planned. The mistaken assumption is that there is a warning message, and that when it is transmitted it impinges or impacts on relatively passive individuals. They are seen as responding directly to the warning. In essence, the assumed model is that the message is a stimulus, and the response is the reaction to it. However, this very simple stimulus-response model is wrong in almost all respects according to the work of social scientists in the disaster area.

Most disaster researchers argue on the basis of their research that in order to understand response to warning it is necessary to lay aside the idea that any message is in itself a warning message, and that individuals as such respond directly to such supposed messages. Warning is far more than a linear transmission of a message from a warning source to the public visualized as an aggregate of individuals. Instead, studies indicate that there is no such thing as a warning message; there is instead what is perceived or believed by people, the meaning they give to the message, which may or may not correspond to the warning message intended by those who issue it. What is crucial is the interpretation which is given to the message, which we shall see, is effected in very complex ways, by a variety of factors--before, during, and after exposure to the message.

In addition, recipients of warning messages do not normally respond directly as individual persons; they react instead in the context of interaction with other people who may or may not be physically present or involved. The interpretation given the intended warning message therefore is usually a group or collective process rather than what individual persons hear or believe. Put another way, there almost always is social confirmation (or disconfirmation) of the interpretation of the message which the individual recipient might initially perceive.

In more technical terms, the response to a warning message should be seen as involving a definition of the situation. This definition of the situation depends upon the interpretation or perception of the message and the confirmation of that message by others. So reaction to warning is a function of both selective perception and social confirmation. It cannot be overstressed therefore that what might be intended as a warning message by those who issue and disseminate it, may not be seen in such a way by its recipients, and they may not at all respond as if it were a warning

message about danger or threat. The definition of the situation intervenes between the intentions of those issuing what they call warning messages and the perceptions and reaction of the intended recipients. An intended warning message may be seen and reacted to as a warning; however, the converse may be equally true, and often is.

What affects the definition of the situation? We have already indicated it is dependent upon the perception or belief that it is a warning, and a confirmation of that belief or perception by others. However, both warning belief and social confirmation, in turn, are dependent on other factors. In this paper, we only have time to illustrate some of the major empirical findings from the disaster research conducted by social scientists in more than a dozen countries in the last several decades.

Such matters as the mode, the form and substance, and especially the perceived relevance of the communication will affect belief about warning messages. Thus, the mode (way or mechanism by which a warning is communicated) makes a difference. Messages received through the mass media of communications, or soundtrucks and loudspeakers, or telephones, or in face-to-face conversations, are perceived as having different degrees of credibility, authoritativeness, or legitimacy. Warnings delivered directly by other people, are more likely to be believed than when communicated by an impersonal medium. The more personal the manner in which a message is delivered, the more it will be given credence. This is related to the fact that the more personal the means used, the more likely the delivered message will be person specific rather than a communication directed to a larger entity such as the public in general.

However, warning messages sent via the mass media are more likely to be believed if delivered by governmental officials rather than by private citizens, or by emergency organization personnel rather than members of other groups. Also different mass media sources in a locality are likely to have different degrees of credibility in a community. Those with the most pre- or non-disaster credibility are most likely to be perceived as issuing a disaster warning.

Generally, warnings via the mass media are more likely to indicate to people that something may be wrong, than it is to mobilize them to a direct response to a warning. Few accept such messages at face value, especially initial ones. In situations where it is possible, people will check for environmental cues--i.e., rising waters, signs of fires, darkening skies, smoke clouds, etc. Greater credence tends to be given to the latter than to warning messages--a good reason why populations living in perilous areas need to be educated about physical danger cues. Mass media communications alert more than they motivate people to directly respond.

However, the more sources (formal and informal, mass media and personal) from which warning messages are received, the more likely the warning will be believed. This is especially true if the content

is consistent. Inconsistent content destroys believability.

The perceived form and substance of the content of a warning message is also important. But form or context is more important than substance. For example, if a radio station broadcasts what supposedly is an urgent message, and then reverts to normal programming it will be far less believed than if the station converts completely and immediately to broadcasting emergency messages.

Content substance, nonetheless, can be very significant. If warning messages are unclear, ambiguous, or easily interpreted as not involving immediate danger, no warning will be perceived. It has long been noted in disaster research that there is a strong tendency on the part of potential disaster victims to assimilate all possible danger cues to the normal. That is, normal human beings will quite normally reinterpret all possible indications of danger as something that is not normally dangerous (thus a loud noise and jarring will be perceived as a car backfire, a jet plane noise, or construction blasting rather than an explosion). Everythink else being equal, verbal messages warning of danger are easily downplayed, or discounted.

The more general the warning message is, the less likely it will be perceived as a warning. The more specific information such a message contains, and especially the more it details something relevant to the listener, the more it is believed. In short, the degree of warning specificity is related directly to warning belief.

The perceived proximity, severity, and certainty of immediate personal danger is also very important in warning belief. Danger warnings afar in time and/or space are usually ineffective. In contrast, communications which indicate immediate and close threat of impact will normally evoke a reaction. Perceived severity is also important. Thus, any message which communicates that there may be extreme danger to self and/or loved ones is usually effective in making people aware of the danger. However, not only must personal risk be seen as high, but it must also be perceived as relatively certain. Warning belief is very high when the danger is thought to have a high degree of certainty for impact.

Past experience with disasters affects all aspects of warning beliefs. The relationship is complex. Prior experience tends to render current warnings more credible if disaster is part of experience. On the other hand, past experience while it may make people more attentive to danger cues, appears to lead them to a more complex assessment of possible personal threat. Also, where disaster subcultures exist, people will tend to define some potential impact in terms of their prior experience with that specific disaster agent, regardless of the content of the warning message.

Equally important to warning message perceptions, is warning confirmation; the almost inevitable interaction to obtain additional information or validation concerning the original message--a confirmation of interpretation. If in the ensuing interaction there

is confirmation, the warning message will be believed. If there is disconfirmation or doubt expressed, additional information sources may be sought, but more likely there will be a perception that the warning message was irrelevant or incorrect.

Very seldom do people receive warning messages while they are in total social isolation. In fact, the typical situation is for exposure to such messages to be in the presence of others, or where others can be quickly and directly contacted, such as in person or over the phone. Thus, unless the danger is immediately and directly threatening--as in the case of a person who sees a tsunami approaching a beach or a toxic cloud from an overturned truck--how others are seen as acting becomes crucial in confirming or disconfirming the original individual perception of the warning message.

Message believability is partly dependent on what happens in the confirmation process. Thus, when others are seen as behaving as if they believe a warning to be valid, the message is more likely to be believed. Similarly the answer of official sources to inquiries which call for validation, corraboration, or refutation helps determine the believability of warnings. Greater credence however will be given to other people than impersonal sources, and to known others than to strangers. Confirmation is also more likely to be attempted for unfamiliar or unusual disaster agents.

Another way of thinking about this is to visualize that there normally is a reaction rather than a response to warning messages. Part of this reaction involves interaction with others. Out of this interaction there may develop social confirmation that there is a threat and this can lead to a response. But if there is disconfirmation, the reactive social behavior may lead to no response at all.

For purpose of exposition we have treated the matter of perception and of confirmation independent of one another. Within each of these processes we have separately discussed factors which influence warning belief and confirmation. In reality, of course, these processes and factors are not and do not operate indepedently of one another. They are all interlinked. For example, the closer a person is to the presumed impact area indicated in a warning, the greater the number of face-to-face communications and the larger the number of sources used in the confirmation effort.

Thus, in thinking about disaster warnings it is necessary to imagine a variety of different processes and factors all operating at almost the same time. The warning behavior of people is an outcome of the product or synthesis of these many matters and not simply the outcome of one process or factor. As said earlier, a warning message is not simply certain information hitting a particular person and evoking a response. Instead as we have suggested, warning behavior involves collective, multiple, and selective perceptions and interactions, a far more complex picture than a simple stimulus-response model of an individual captured. Sometimes reality is complex and it is to delude oneself to seek overly simple explanations.

So far we have primarily discussed differential perceptions or what might lead to different definitions of situations in warning situations. However, similar definitions of situations need not necessarily lead to similar disaster responses. For example, an individual might hear and accept a warning message about a sudden flood as valid; another individual might do likewise for the same flood. Yet their manifest behavior may differ radically; one might evacuate the area, the other might not. The reason for this is that there are other factors besides the definition of the situation which will affect the behavioral response.

For purposes of giving some focus to our discussion, we will consider some of these other factors which will influence whether or not evacuation will occur. Evaucation, or movement away from the endangered area, is only one possible response--there are a variety of preventive, mitigatory, precautionary measures possible--but generally evacuation is a very adaptive one. Contrary to some mythological beliefs, evacuation is usually very orderly and does not degenerate into panic-like behavior. If there are problems in evacuation they often stem from organizational failures to provide guidance and the necessary resources, rather than from the behavior of evacuees themselves. Too often evacuees are blamed for difficulties which stem fromthe decisions, policies, and actions of organizations and agencies which have the responsibility for and are carrying out the evacuation.

Even with our specific focus on evacuation as a possible response to warning, we only have time to illustrate several major themes drawn from the research literature. In particular we want to touch upon the reluctance to evacuate, the fact that evacuees may or may not be reacting to a warning message, and that evacuation almost always involves a great deal of self control and small group initiative. As in the instance of perceptions of warning messages, there can be considerable differentiation in evaucation responses.

In fact, given a choice, non-evacuation is preferred to evacuation. Even when a warning message is perceived as valid and is socially confirmed, there still may be a reluctance to evacuate. This is not because people are paralyzed in the face of danger; on the contrary, individuals under stress typically attempt to consider which would be the least disruptive behavioral option in the situation. Sometimes, therefore, there is a collective decision that the behavior ought to be something other than an evacuation of the area. Some protective action other than evacuation is especially likely if there is only a moderate rather than strong belief in a warning threat. Even when people feel endangered, as much as possible, they attempt to maintain their traditional and routine ways of behaving. Leaving an area in the face of a threat is not an everyday behavior.

In some cases, the reluctance to evacuate may be because the warning message lacks the second component necessary for the effectiveness of any warning. A warning message to evoke an appropriate response must not only indicate there is danger, but also what should

be done in the situation. If a message does not indicate how the threat might be prevented, avoided, or minimized, it cannot itself generate a functional response to the situation which might include leaving the threatened locality. A failure to evacuate may simply stem from a failure of the warning to explicitly communicate such a message.

Of course, there can be evacuation in the absence of such a warning message, or no evacuation in the face of an order, recommendation, or suggestion to leave. Disaster planners and emergency personnel often find such behavior disturbing and frequently blame people for not listening to them. Leaving aside the Big Brother implications of such a criticism, the fact is that such behavior is quite understandable. In addition to reacting to warning messages, endangered populations are making other observations of the situation. People interact with one another. Warning messages are only one element that are either individually or collectively considered, and that may not be seen as the more important aspect of actual or potential disaster.

For example, persons may refuse to evacuate because they are concerned their empty homes may be looted. That the concern is an invalid one--the supposed prevalence of looting being one of the biggest mythologies about disasters--is irrelevant against the belief of some people that looting is a problem. So warning messages to evacuate to safer areas may be disregarded because other considerations are deemed more important than safety. Conversely, while local residents usually are reluctant to evacuate, tourists, travelers, and strangers in given localities are very likely to leave at the first indication of possible danger. Typically they will evacuate even when no evacuation warning messages have been issued. Persons in unfamiliar settings are reluctant to remain in them when personal danger is perceived.

However, even when people are afraid--and they usually are when they see themselves personally threatened--they do not bolt in panic flight. Panic is a very rare phenomena and not al all a typical response to perceptions of danger. In fact, it would be very difficult for a warning message to evoke panic flight. Panic behavior requires certain very specific conditions, including the perception that escape is possible from a very immediately threatening personal situation (a perception of being trapped does not evoke panic flight since it is hope rather than hopelessness which is involved in panic behavior). Thus, warning messages which are perceived as valid and socially confirmed, do not lead to the abandonment of traditional roles and responsibilities. Warnings, in fact, may generate much self-control and small group initiative.

This is seen in that evacuation is not likely to occur if family members are separated at the time of the perception of the danger, whether the threat is seen as the result of a warning message or otherwise. If at all possible, family members will wait in an endangered area until family members can come together and confirmatory behavior can occur. When they evaucate, families move as units.

Ignoring public announcements of their availability, they avoid as much as possible mass shelters, if the physical circumstances of the disaster permit it, and choose instead to go to the homes of kin and friends. One consequence of the delay in waiting for family members to assemble is that the start of an evacuation response may be considerably stretched out over time.

As all these examples illustrate, there is no simple or direct response to a warning. There is a reaction rather than a response. But actual or potential disaster victims do not react in a uniform way to perceived and confirmed warning messages. The consequence is that just as there are differentiated perceptions, there are differentiated responses.

Before drawing some applied conclusions from what we have said, we will discuss two additional questions often addressed to disaster researchers about their studies. The first question has to do with the general applicability of findings about disaster warnings across different disaster agents. Agents differ in such matters as predictability, speed of onset, length of forewarning, duration of impact, destructive potential, controllability, etc. Does not the nature of the disaster agent involved make a difference? The answer generally appears to be no, insofar as what we are talking about here. Short run disaster situations, as noted at the beginning of this paper, are far more alike than they are dissimilar because of the disaster agent involved. Of course, threatened populations, for example, may have more familiarity with certain kinds of disaster agents than others, such as those who live in the hurricane-typhoon-cyclone vulnerable regions of the world. But the prime factor which effects the reaction behavior in such cases is familiarity with the disaster agent, rather than something inherent in the agent itself. Research studies have consistently shown it is better for most purposes insofar as human and social behavior is concerned, to assume generic disaster rather than agent specific phenomena.

A second question often raised has to do with the cross-cultural validity of disaster research findings. Do the findings apply in all societies? The concern here appears to be that the majority of disaster studies have been carried out in industrialized and urbanized countries, and therefore there is an issue about whether the findings of such research are applicable to more agriculturally and rurally based societies. Generally, the answer appears to be yes. There are some major differences in disaster phenomena which appear to be related to such societal matters as centralization of authority, resource availability, cultural values, etc.--there is no doubt about that. However, most of these cross-cultural differences appear to be related to macro level aspects of disasters--how the society as a whole, the communities and organizations within it prepare for and recover from disasters. There appears to be less cross-cultural differences at the micro level--how individuals and small groups react to the emergency time period of disasters. That is, human beings are more alike in their personal and interpersonal behaviors under extreme stress than might be indicated by the sometime substantial differences in their larger cultural and societal behaviors. We do not

argue for total similarity; only that it is better for the question addressed in this paper to assume universal human characteristics rather than to be blinded by the actual group or macro level differences which exist.

What is implied about disaster planning and operations in what we have so far discussed about disaster warnings? Studies may uncover all kinds of mythologies or false beliefs as well as how people actually behave in disasters, but unless such knowledge is incorporated into the thinking and activities of disaster planners and emergency operational personnel, the research findings will be useless. The fact that few social scientific findings have thus far been used to improve disaster preparedness and response is truly criminal. Unlike some other areas of disaster phenomena, we know much about disaster warnings and reactions (some of which have been just discussed). This understanding should be used. We suggest the following three ideas might be especially important in application efforts.

A Summary

First, disaster planners and operational personnel must work with correct assumptions about the nature of disaster phenomena. Thus, an approach which implies that initial and prime concern should be with the content of warning messages *per se* is an inappropriate starting point. We should start with what we now know people are likely to perceive or believe. The first focus for planning purposes should be on the perceptual behavior of the probable people in the situation, not the words used to warn them.

We have indicated what affects perceptions. We have noted some factors leading them to define a threat as real. It is the perception of the danger as real which is crucial. It is not whether there is some threat from the perspective of outside observer or from from the viewpoint of emergency organization officials issuing a warning. As long stated in sociology, if people define a situation as real, it is real insofar as consequences are concerned. A failure by disaster planners and operational personnel to acknowledge this simple but important principle can undermine the best of intentions or most of the resources in efforts to generate appropriate responses to disaster warnings.

Second, good disaster planning must take into account that warning messages do not impinge on isolated or solitary individuals. The warning is either confirmed or disconfirmed in the course of interactions with others. Initially there is a reaction rather than a response. We should therefore start with what we know of how groups are likely to react, rather than with what individual responses might be. We must make the social process of confirmation central in developing how warnings of disasters should be handled.

The central point here, again drawn from sociology, is that human beings do not live in isolation. To be sure, some categories

of persons such as the elderly, minorities, and certain segments of the working class are often not in the mainstreams of their societies, but even they are embedded in a matrix of social networks and relationships. We have noted how the group nature of social life affects perceptions of warnings. We have indicated that *social confirmation is crucial for a belief that a message is indicating real danger.* Disaster planning must recognize this principle. More important, there is a need to plan in a way that will provide social confirmation rather than disconfirmation of warning messages.

Finally, disaster planning needs to accept the fact that groups threatened by disaster do not passively wait to be guided by governmental or emergency organizations. In crises situations, the groups will be partially proactive as well as reactive. As such, warning messages will be only one element in the total picture, and not necessarily the most salient or important factor. Reactions are only partially to warnings, and therefore a response such as evacuation may or may not be a reaction to warning messages.

The central point in all of this, well established by disaster research, is that functional and adaptive reactions are attempted by endangered groups. They do not react irrationally in most senses of the term, and certainly not from their own perspective. They attempt to do what appears to them to be most appropriate for the situation. Effective disaster planning takes this into account--in the words of some disaster researchers, *plans should be adjusted to the probable behavior of people rather than attempting to force people to adjust to plans.* This is certainly applicable to the planning of disaster warnings and the appropriate responses intended to be generated by them.

****

This paper has drawn from many research sources but particularly

1. F. B. McLuckie, The Warning System in Disaster Situations: A Selective Analyses. Columbus, Ohio: Disaster Research Center, The Ohio State University, 1970.

2. Dennis S. Mileti and E. M. Beck, "Communication in crises: Explaining evacuation symbolically." Communication Research 2 (1975) 24-49.

3. Ronald Perry et al, Evacuation Decision Making and Emergency Planning. Seattle, Washington: Battelle Human Affiars Research Center, 1980.

4. E. L. Quarantelli, Evacuation Behavior and Problems: Findings and Implications from the Research Literature. Columbus, Ohio: Disaster Research Center, The Ohio State University, 1980.

Reaction Pattern