

## MOTIVATING PUBLIC EVACUATION

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*A common theme in the literature on evacuation compliance is the result of largely social psychological perceptions of risk formed prior to taking the protective action. From this perspective, evacuation is a function of warning recipients coming to define themselves as in danger and believing that fleeing the immediate environment will reduce that danger. This paper explores the social psychological and social structural processes that result in such perceptions. In particular, attention is given to identifying perceptions that motivate evacuation, factors that direct perceptual outcomes and the ways in which motivation and perception are translated into action.*

Public evacuation has been well researched from a variety of practical and theoretical perspectives. A frequent theme found in the conclusions of work on this topic is that evacuation behavior is a consequence of the perceptions which people form about risk prior to taking protective action (cf. Drabek 1969; Mileti and Beck 1975; Perry 1979; Sorensen 1985; and others). Evacuation is largely a function of people coming to define themselves as being in danger and perceiving that leaving their immediate environment is an appropriate action.

The process of forming perceptions in any social circumstance is an ongoing activity. New stimuli or motivations are continuously introduced into perceptual fields and are processed and reprocessed to fit into a context of reality. The result is consummation or decision making which produces what Mead (1938) termed the "Act." Mediating this process—motivation to decision making to the act—are the elements of perception and manipulation. The ultimate conclusion of the process is actions aimed at resolving the problems perceived as needing immediate attention. For analytic purposes, the things people do during the perception formation process can be

broken down into identifiable parts, and when taken together constitute an act.

Understanding the formation of perceptions requires examination of the elements contained in the process itself. The process first becomes embedded in a situation, and any encountered situation engages people in active problem-solving.

The situation is the set of values and attitudes with which the individual or group has to deal in a process of activity and with regard to which this activity is planned and its results appreciated. Every concrete activity is the solution of a situation. (Thomas and Znaniecki 1947, p. 76)

Characteristics of the public (i.e., economic, social, religious, educational, experiential, cognitive, and so on) are brought into the situational context. Out of the interplay between these objective conditions and the presented event, a "definition of the situation" occurs (Thomas and Thomas 1928, p. 572). "And the definition of the situation is a necessary preliminary to any act of the will..." (Thomas and Znaniecki 1947, p. 76).

Perceptions, then, consist of how people have come to define the situation in which they are involved and how definitions are formed within a problem-solving, goal oriented context (Charon 1989, p. 122). Various elements interact within this perception formation process out of which the situation is defined and a course of action is developed.

The cause of action is always definition, and the definition is not easily understood: Goals, perspective, significant others, reference groups, objects, other people, view of future and past, and assessment of what is taking place in the situation are all matters that must be considered if action is to be understood. (Charon 1989, p. 126)

Decisions to evacuate are influenced by the perception formation process which occurs under "normal" conditions of social life. In fact, evacuations present an opportunity to observe the more significant elements of the perception process at work. This process becomes centered in the context of communicated evacuation advisements; and variation in observed public response to such advisements is best understood when the process of perception formation is taken into account.

Significant research evidence exists to suggest that the communication process in issuing evacuation advisements is the key to understanding how people become motivated to evacuate or engage in any protective action (Kunreuther 1978; Mileti et al. 1981; Turner et al. 1981). The initial step occurs when a warning message or piece of information enters a person's

sensory field. However, hearing a message is more complex than meets the eye. People hear many things which must all be fit into their ongoing activities. The continual formation of perceptions is an attempt to solve the problems of making sense out of the things presented in fields of reality.

Thus, sensory perception is not passive reception, but active inquiry. It is a task to be accomplished.... We must place sensation in a context, draw inferences, use concepts, project, select, learn, impose structure; in doing this, we rely on convention, on tradition, on accepted paradigms, hypotheses, beliefs, and social pressures. (Abel 1976, p. 41)

Perceptions are cognitive processes consisting of the interaction of many elements. Elements in this perception formation process include, beliefs, understandings, guesses about what is happening based on past experiences, and cues from various events or others in the immediate environment. All of these elements work together to eventually produce a formed perception of what is occurring and what needs to be done in response to the event at-hand.

This forming and reforming of perceptions occurs throughout all of social life. It results in varied behaviors and includes evacuation. The purpose of this paper is to review this perception formation process as it is related to motivating public evacuation. We will synthesize the results of research and attempt to present theoretical insights into the various motivational factors which influence public evacuation behavior.

## THE PERCEPTIONS WHICH MOTIVATE EVACUATION

People who receive evacuation advisements form personal definitions about the faced risk and what actions to perform. These situational definitions are comprised of several perceptual elements and include understanding, belief, and personalization.

Understanding an evacuation advisement refers to the personal attachment of meaning to the message that is heard. Meaning or understanding can vary among people, and these varied understandings may or may not conform to the meaning intended by those who issued the message (Foster 1980; Perry et al. 1981; Lehto and Miller 1986). For example, one person may understand a flood message to foretell risk of an inundating wall of water while another may perceive it to be less threatening. The attachment of meaning to a message thus depends upon an individual's interpretation of the risk conveyed. Consequently, meaning can vary considerably across a diverse public.

is connected to people's existing frames of knowledge and reference developed prior to the emergency situation. It may be difficult for people to understand a natural hazard warning when they do not understand much about the hazard which they are facing. In this sense, understanding defines and bounds perception of risk and what to do about it.

Additional elements in the perception formation process are belief in what is heard and personalization of risk. Belief in the communicated warning message and personalizing the danger often vary among a public at risk (Clifford 1956; Wallace 1956; Demerath 1957; Williams 1957; Fritz 1961; Moore et al. 1963; Drabek 1969; Mileti 1975; Mileti et al. 1975; Quarantelli 1980; Yamamoto and Quarantelli 1982). The public is more likely to evacuate based on perceptions that what is heard about the risk is true, and that they are among the intended targets of the warning.

When people have heard the emergency information, formed an understanding of what was said, defined a level of belief in what was said, and determined a level of personal risk, then action will ensue based on the perceptions formed (McLuckie 1970; Mileti et al. 1975; Baker 1979; Perry 1979; Flynn and Chalmers 1980; Quarantelli 1980; Nigg 1987; Perry et al. 1981; Bellamy and Harrison 1988). While people typically go through the perceptual elements outlined each time new information is received they do not passively await the arrival of more information.

When warning information is received, most people try to verify what they heard by seeking out additional information. Seeking new information has typically been referred to as the warning confirmation process (Danzig et al. 1958; Drabek 1969; Drabek and Stephenson 1971; Mileti et al. 1975; Quarantelli 1984). Confirmation is a main reason that telephone lines, for instance, often become busy after a public evacuation advisement is issued; people call friends and relatives to get their interpretation of the event and to find out what they are going to do. Confirmation, then, plays an important role in facilitating understanding, belief, and personalized perceptions which shape evacuation behavior (Mileti and Sorensen 1990).

An evacuation advisement, when heard, actually serves to disrupt people's routine perception formation processes; it stimulates them to actively take note of their environment and begin to engage in conscious problem-solving. Perceptual components of the process include forming an understanding of what was heard, ascription of belief, and personalization of the message to make the risk relevant. These perceptions combine to shape individual definitions of the situation—what they perceive the risk to be and their ideas of what constitutes an appropriate protective action. The situational definitions which people form are very much influenced by the

actual characteristics of the emergency information which they receive as well as the personal characteristics of those who hear that information. These factors influence the formation of risk perception and subsequent evacuation behavior.

### THE FACTORS WHICH DIRECT PERCEPTUAL OUTCOMES

As with any other act, response to risk centrally involves stimuli being presented to an already existing context of ongoing perception formation processes. Stimuli, such as an evacuation warning, disrupt a public's routine perception formation processes by interacting with people's beliefs, cognitions, understandings, and personalization of the event at-hand. The result is action, of some sort, stemming from the defined situation. In this way, risk information helps to form and shape a public's definition of the situation. In addition, the contents of the risk message serves to provide guidance and information for the public to draw on in its problem-solving efforts. The result is a solution to the problem embedded in the situation. Taken together, stimuli (the message), perception formation, and response becomes an act of evacuation.

The well established principle that if people define a situation as real they will behave according to their definitions and that their actions will be real (Thomas and Thomas 1928), has been corroborated by literally dozens of evacuation-related investigations. Over the past several decades, researchers have closely looked at the determining factors influencing the formation of risk perceptions in times of disaster. People tend to behave in response to hazard warnings in general and evacuation advisements in particular in ways consistent with their situational perceptions of risk. Response is then driven by their definitions of the situation. When viewed collectively, these studies provide a basis for explaining how and why the public is motivated to evacuate.

### Information Factors as Stimuli

Information presented in a person's environment acts as a stimulus or motivation to engage people in the process of forming perceptions about a given situation. Information about the risk people face and advised evacuation becomes a dominant stimulus setting people off on a course of perception formation. Several information-specific factors have been demonstrated to shape and mold an endangered public's perception of risk and subsequent actions aimed at resolving the presented problem. For example, in the context of disaster, information factors can strongly and directly

influence people coming to believe the danger to be real, understand the event as needing special attention, and defining the danger as something they must personally do something about, such as evacuating a particular area. These factors are largely related to qualities of the message; they are important to consider when understanding the determinants of human response in the risk communication process, and they follow.

**Source.** Who gives an evacuation advisement shapes the perception of risk which the public forms. Information from credible and reliable sources encourages information believability. Since people have different views about who is credible and who is not, evacuation advisements which come from a mix of scientists, organizations, and officials serve to facilitate perceived belief (Drabek 1969; Drabek and Stephenson 1971; Mileti et al. 1981).

**Consistency.** An evacuation advisement promotes the formation of accurate perceptions if it is consistent in the information it provides with other publicly announced advisements (Clifford 1956; Fritz 1961; Drabek 1969; Foster 1980, p. 192; Perry and Greene 1982, pp. 326-327; Sorensen 1982, p. 20 and 1985, p. 13; Quarantelli 1984; Rogers 1985, p. 5). Consistency positively shapes the perceptions of understanding, belief, and personalization. Inconsistency creates confusion and uncertainty among recipients of a message.

**Accuracy.** Evacuation advisements can vary in the extent to which the contents of the message, in terms of risk, location and what to do, is or is not perceived to be factual or accurate. Such perceptions have been found to cause people not to believe what they hear (Mileti et al. 1975). Perceived accuracy is enhanced simply by being fully open and honest with the public in evacuation advisements.

**Clarity.** A warning message that advises public evacuation must be worded in simple language so that it can be understood (Quarantelli 1984, p. 104). Lack of clarity can lead to public misunderstanding of the message (Williams 1957; McLuckie 1970; Drabek and Stephenson 1971).

**Certainty.** Public information enhances perceptions consistent with evacuation if it conveys a high level of certainty about the events taking place and what people should do. Even in an ambiguous situation a message stated with certainty will impact public belief in the message and affect decision-making (Turner et al. 1979, p. 61; Perry et al. 1982). Certainty extends beyond message content to include the style with which it is delivered. Certainty is enhanced if the person delivering the message does so in a tone indicating that he or she believes or is certain about what is being communicated.

**Sufficiency.** Sufficient information in a message facilitates the formation of sound public perceptions of exactly what is happening and what to do. Insufficient information creates confusion and uncertainty. Too much detail may be overwhelming. The amount of information provided affects understanding, personalization, and belief. For example, a study of family response to hurricane and flood warnings found that general and vague warnings caused people not to take protective actions (Leik et al. 1981). Conversely, a study of response to the Mt. St. Helen's eruption found that detailed information led to higher levels of perceived risk and a greater likelihood of public protective action being taken (Perry and Greene 1983).

**Guidance.** The provision of a clear statement of guidance about what people should do about the event being described, and how much time they have in which to act assists public perceptions. For example, it cannot be assumed that members of the public will know what constitutes evacuation. The protective action must be described. Public understanding of communicated emergency risk information is enhanced if it is specific regarding the risk, the hazard, what the public should do, and how much time is available before impact, all of which influence public personalization of the risk and subsequent response (Drabek and Boggs 1968; Mileti and Beck 1975, p. 45; Flynn 1979, p. 19; Dynes et al. 1979, p. 152; Carter 1980, p. 228; Perry and Greene 1982, pp. 326-327; Perry et al. 1983, pp. 62, 282; Quarantelli 1984, p. 512; Nigg 1987, p. 111). This point is not as obvious as it seems. For example, flood warnings must do more than tell people that they should "get to high ground." High ground for some may be perceived as low ground for others.

**Frequency.** Frequency, or the number of times an evacuation advisement is delivered, affects hearing, understanding, and belief. Numerous studies underscore the importance of repeated hearing of a message as a condition for adequate public perceptions and response (Fritz and Marks 1954; Drabek and Boggs 1968; Mileti and Beck 1975, pp. 39, 41; Baker 1979, p. 13; Turner 1983, pp. 25, 312; Mikami and Ikeda 1985, pp. 109-110; Rogers 1985, p. 5). Frequently repeated messages help to reduce the potential for public misperceptions. Frequently recurring messages focus people on official warnings, reduce rumors, and increase public confidence in the validity of the warnings. In protracted emergencies, however, there is a point of diminishing returns after which constant delivery of no new information may be counterproductive.

**Specificity.** Clearly specifying the location of danger in an evacuation advisement is important in facilitating public belief and personalizing risk. Location-specific messages lead to greater levels of personalized risk in the

public (Perry and Greene 1983; Nigg 1987). Detailing the location of risk is best done in ways readily understood by the public.

**Channel.** The avenues through which the information is delivered shapes public perception and action. Information communicated over multiple channels, such as printed and electronic media or personally delivered, has been demonstrated to enhance public understanding, belief, and response (Mileti and Beck 1975, p. 39; Flynn 1979, p. 21; Turner et al. 1979, p. 120; Carter 1980, p. 5; Hiroi et al. 1985, p. 23; Rogers 1985, p. 5; Nigg 1987, p. 111). Warnings can be issued to the public in a variety of ways: voice, electronic signals, or in print. Voices can be direct or broadcast over loudspeakers, public address systems, telephone, radio, or television. Signals include sirens, alarms, whistles, signs, and lights. Leaflets, brochures, or video can be used to distribute graphic information and printed messages. The most effective warnings use a range of possible channels instead of a single channel.

### Public Factors

Information factors affecting the perception formation process do not operate in isolation. Information factors interact with the personal and social characteristics of a public. Public factors can operate in ways that can constrain and/or enhance the effect of communicated information. These pre-event public factors, which people carry with themselves into a hazardous situation, fall into six categories.

**Cues.** Environmental cues or the physical characteristics of the setting in which the public receives emergency information interact with the information factors just described. For example, it is more difficult to get a public to believe a flood warning on a sunny day or if neighbors are not seen evacuating in concert with receiving evacuation instructions. Location of the risk or geographical proximity of those at risk to the impending threat is another physical factor that affects the perception formation process (Diggory 1956, pp. 617, 736; Flynn and Chalmers 1980, pp. 51, 110; Perry and Lindell 1986, pp. 85, 109). Such "environmental cues" impact the perceptions of understanding, believing, personalizing, as well as actual action (Drabek 1969; Mileti et al. 1975; Flynn 1979, p. 19; Quarantelli 1980, p. 107; Cutter and Barnes 1982; Saarinen and Sell 1985, p. 156; Bellamy 1987, p. 3; Rogers and Nehnevajsa 1987; Tierney 1987).

**Social setting.** Social setting factors include whether the family is united or not when the warning is delivered, what activities are being performed at that time, and what others are doing to respond. Social setting factors affect public belief and action (Clifford 1956; Moore et al. 1963;

Dynes and Quarantelli 1968; Drabek and Stephenson 1971; Flynn 1979). Mack and Baker (1961), for example, reported that family unity at the time of a warning increases the likelihood of belief; and Drabek and Stephenson (1971) similarly noted that families who are united at the time of a warning are more likely to respond to the warning. In addition, neighbors and friends evacuating are major influences in decisions to evacuate. For example, Cutter and Barnes (1982) noted that evacuation behavior was associated with knowing a neighbor had evacuated during the Three Mile Island (TMI) accident.

**Social ties.** Social ties also affect perceptions and evacuation (Clifford 1956; Gruntfest 1977; Worth and McLuckie 1977, p. 72; Mileti et al. 1981, pp. 112-114; Rogers 1985, p. 15; Bellamy 1987, p. 5). Perry (1979), for example, found that as family cohesion increased, the likelihood of evacuating in response to a flood warning concomitantly increased; and Sorensen and Richardson (1984) alternatively discovered that knowing someone who worked at Metropolitan Edison was related to decisions not to evacuate during the TMI emergency.

**Social structure.** Characteristics of the members of the public who receive evacuation advisements, such as resources, gender, or socioeconomic class, can influence understanding, belief, personalization, and response (Friedsam 1962; Flynn 1979, p. 29; Turner et al. 1979, p. 15; Perry et al. 1981, pp. 102, 157-158; Yamamoto and Quarantelli 1982, p. 44; Rogers 1985, p. 7; Nigg 1987, p. 111; Perry 1987, p. 148). For example, older people were less likely to have heard the Rapid City Flood warning regardless of the source of the warning (Mileti 1975). In an analysis of the TMI accident, Sorensen and Richardson (1983) found that older people were less likely to evacuate. While not well understood, gender has also been found to be related to warning belief. Women are more likely to believe a warning than men (Drabek 1969; Turner et al. 1981, p. 27; Yamamoto and Quarantelli 1982, p. 44).

**Psychological factors.** Psychological characteristics such as cognitive abilities or personality also influence how a warning is interpreted. Limitations in cognitive abilities can be a constraint to accurate perceptions if people are provided with too much information (Sims and Bauman 1972, p. 1391; Flynn 1979, p. 19; Turner et al. 1981, pp. 27, 40; Quarantelli 1980, p. 107; Perry 1987, p. 151). Personality is also related to perception formation and action. The personality factor most investigated in the context of warning response is locus of control. Simply stated, people with an internal locus of control are self-determined; people with an external locus of control have fatalistic views of the world (Rotter and Mulry 1965;

Strickland 1965; Rotter 1966; Davis and Phares 1967; Lefcourt 1976). People with an internal locus of control tend to feel they have control over their fate, while those with an external locus of control feel their fate is in the hands of others. The former are more likely to believe, personalize, and respond to an evacuation advisement than the latter (Dynes et al. 1979, p. 52; Flynn 1979, p. 19; Turner et al. 1981, pp. 27-40; Landry and Rogers 1982, p.3).

**Pre-warning perceptions.** People filter information to conform with their pre-existing views of the world. Consequently, preconceived ideas of an emergency type can impact situational perceptions. Without adequate emergency information, people may disregard warnings if their risk perceptions are extremely biased (Baker 1979, pp. 18-19; Flynn 1979, pp. 17-21; Livermore and Wilson 1981; Mileti et al. 1981).

### HOW MOTIVATION AND PERCEPTION DIRECTS ACTION

Once information is received but before it influences actions, an intervening process of perception formation takes place within which a process of interpretation occurs simultaneously. This process of interpretation, or actively defining what is happening as real, is guided by the stimulations, cues, suggestions, and definitions people secure from their environment (Blumer 1969, p. 188). It is within this context of interpretation and perception formation whereby a sense of reality is developed and frames of action are created (Mead 1938, pp. 6-28; Thomas and Znaniecki 1947, pp. 76-77; Shibutani 1961, pp. 67-110; Blumer 1969, pp. 183-194; Berger and Luckmann 1971, p. 447; Abel 1976, pp. 36-41; Goodman 1978, pp. 2-6; Lewis and Smith 1980, pp. 29-34; Charon 1989, pp. 122-126). It is within this interpretation stage of the perception formation process where the characteristics of evacuation advisements being disseminated to an endangered public have the potential to strongly influence the perceptions of risk eventually arrived at by the public.

Developing appropriate public perceptions of risk is significantly influenced by characteristics of the information presented as a motivational factor or stimulus to define a situation as risky enough to warrant evacuation actions. In addition, this process of coming to understand, believe, and personalize risk is different for different people depending upon the contextual baggage or pre-warning characteristics people bring to the imposed situation.

Motivational factors (e.g., information stimuli) involved in evacuation and the contextual baggage members of a public bring to the situation will have different impacts on the formation of perceptions relative to the

strength of those influential factors. While information and public factors operate side-by-side, when information is formed in the styles outlined, it can come to be the dominant factor which influences the perception formation process. The perceptual outcomes depend on the intensity and quality of the motivating factors contained in the information stimulus presented in a particular situation. On the other hand, the contextual baggage brought to a risk perception situation can come to dominantly influence the process when the risk information is styled weakly. Thus, at times, due to the variability in intensity and quality of the information presented a situation, contextual baggage brought to the imposed situation may come to possess greater or lesser influence on the perception formation process and subsequent public action.

Since the degree of intensity and the quality of information is important if characteristics of the information are to influence perception, we must understand what degree of intensity and quality of the information is needed if the influence of pre-event public factors is to be over-ridden. Research has demonstrated that the influence of information can strongly affect the perception formation process. That is, when it is frequently delivered, clear, understandable, and unambiguous, information can significantly enhance the problem-solving agenda embedded within the process of forming perceptions about risk. When information is repeatedly and consistently delivered and when it enters into the public's informal communication processes with one another, the message (e.g., evacuation warning) is provided its greatest opportunity to help an endangered public form a definition of the situation consistent with the risk it faces. In this way, by assisting and guiding the definition of the situation, the actual behavioral outcome can also be greatly enhanced. The likely end result is optimization of evacuation actions by a socially, economically, and psychologically diverse endangered public.

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