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PUBLIC RECOGNITION OF HAZARD[1]

George Oliver Rogers

University of Pittsburgh
Pittsburgh, PA 15260

ABSTRACT

Like hazard identification, the public recognition of hazard reduces uncertainty by delineating the relatively risky from the less risky. For centuries humans have relied on actuarial experience in recognizing hazardous situations. However, the risks associated with more complex technological systems often veil the nature, likelihood, and severity of the risk. Moreover, many risks are obscured by relatively delayed, and long-term effects, sometimes associated with very small "doses." While it is clear that these cases require scientific intervention in the identification of hazard, little is known about the social process involved in the use of experiential data in the recognition of hazard. This paper examines the relationship between prior experience and risk estimates for a variety of hazards.

KEY WORDS: Risk Recognition, Hazard Experience

INTRODUCTION

The public recognition of hazard rests on a foundation of experience and values. Like hazard identification, the public recognition of hazard reduces uncertainty by delineating the relatively risky and potentially risky, from the less risky. People have historically relied on actual experience with hazards as the primary mechanism for recognizing hazardous situations. Complex technological systems often veil the nature, likelihood and severity of risk. Many risks are obscured by delayed or long-term effects. Such risks clearly require scientific intervention in the identification of hazard. But for hazards, where actualized hazard experience is available, the public seems to recognize the potential for harm. Little is known, however, about how such experience is used in the public recognition of hazard. The public recognition of hazard often forms the larger context for the assessment of risk by risk analysts. Their credibility is frequently jeopardized by failing to adequately

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understand this context of the public recognition of hazard. This paper examines the relationship between experience and hazard by the general public.

Potential hazards are actualized in terms of initiating event(s), their outcome(s), exposure(s) and consequence(s). The risk event initiates the actualization of any hazard. It may be the result of a social action or an environmental process. The risk event is characterized by an unknown probability of occurrence, which implies that "...risks can never be measured precisely" (Whyte and Burton 1980:3), because "...it is always a question of estimation." However, the estimates of the likelihood of event occurrence, with varying degrees of precision, must inherently be used in forming attitudes about the hazard and, of course, in determining potential actions for dealing with the event, both ex ante and post hoc. For example, the probability of a flood is based on the weather patterns of the season, the river system capacity, the snow pack, ground water capacity, and the history of the particular river system for flooding under comparable circumstances, but the probability of flooding cannot be precisely determined. "An event is defined by its complete description and the probability of its occurrence" (Rowe 1977:99). To varying degrees, both the true probability and the estimates are temporal and spatial. The true probability of some hazards (e.g., weather-related hazards such as snowstorms, tornadoes, and hurricanes) are certainly seasonal and regional. Other hazards may pose more or less constant threats to specific areas (e.g., earthquakes, chemical hazards, nuclear war, and nuclear power plants). The true probability and the associated estimates are based on varying degrees of human experience and knowledge, and form probability distributions that may or may not vary in accord with one another.

THE RECOGNITION OF RISK

Hazard recognition comprises an awareness of the conditions and circumstances that constitute the potential for harm. It is the discovery, identification or recognition of potentially hazardous situations. Uncertainty is reduced through recognition of potentially hazardous situation. "For most of human history, the identification of...risk arose from direct human experience" (Kates 1978:14). However, in modern times society seems to be increasingly dependent upon science for identification of risk (cf. Nehnevajsa 1981) in part because science and technology have created more effective ways of observing and predicting hazardous situations, and in part because hazards are more likely to be detectable only by sophisticated, scientifically developed technology. While scientists sometimes support conflicting knowledge-claims and thereby produce an aura of questionable credibility, the experience of everyday living or ordinary knowledge remains a fundamental component of the knowledge-base on which people recognize hazardous situations (Nehnevajsa 1981). The knowledge-base on which hazard recognition rests is in part ordinary or working knowledge, based primarily on experience, and in part scientific knowledge, based primarily on systematic study. Hence, a significant portion of the recognition of hazard is based on previous experience.

Hazard perception is contingent on its recognition. For example, non-recognized hazards may exist, even for some time, before they are recognized (cf. Lawless 1977). The causal links between the various components of hazard actualization is fundamentally based on knowledge. For example, if a particular consequence is attributed to an event, say event X, but is actually the result of some other risk event, say event Y, the second event (Y) may or may not be recognized as hazardous. It is when knowledge of the linkage between the event (Y) and the consequence exists that situations leading to event Y may be recognized as being hazardous.[2] The immediacy of the effect and the familiarity associated with a particular hazard are fundamental elements of the knowledge-base and determine to some extent its use. In the sense that non-recognized hazard cannot be estimated, the perception of hazard is dependent on the recognition of the potentially harmful situation. Like perceived hazard, the acceptability of risk is contingent upon the recognition of hazard. In essence, a hazard cannot be deemed either acceptable or unacceptable when it remains non-recognized. The foundation of our fear, anxiety and concern, which is associated with the acceptability of risk, is dependent on: (a) the commonly understood nature of the risk in terms of peoples' familiarity with it, (b) immediacy of effect, (c) the general knowledge concerning its riskiness, and (d) potential and actual benefits. These dependencies are summarized in Figure 1.

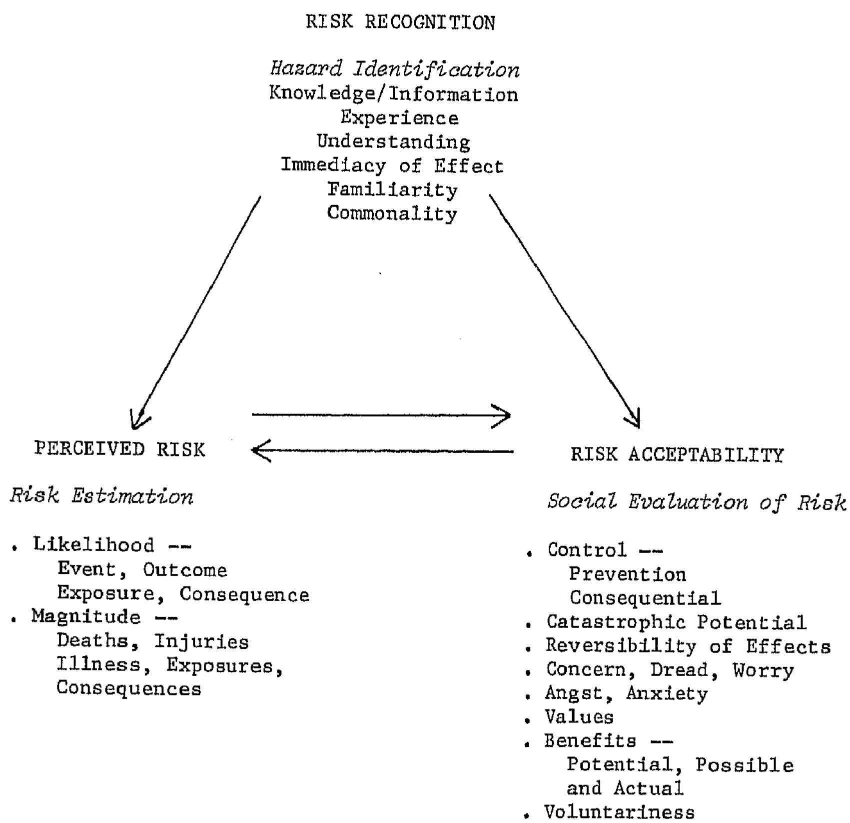

Figure 1

Risk Recognition, Perceived Risk and Risk Acceptability

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[2]Event Y could have other recognized consequences which would make it recognizable as hazardous, but only when knowledge of the link exists may Y be recognized as hazardous in terms of this consequence.

The recognition of hazard is addressed in terms of estimated likelihood of various risks by geographic region of the United States. The distribution of perceived hazard across the various geographic regions of our country serves to underscore the idea that people tend to know, if only in the ordinary sense, the hazards they face. This does not mean, nor should it be inferred, that residents of an area, know in a comprehensive sense, the hazards they potentially face, but rather that there is a sensitivity to the major hazards recognized as part of the area's ambience.

Conceptually, life-experience is inherently related to hazard recognition because "ordinary knowledge" principally comprises experiences of various kinds, and the perception of hazard rests firmly on this data-bank of knowledge. The cognitive processes, through the use of heuristics (cf. Tversky and Kahneman 1973, 1974 and 1981; Tversky 1972; and Kahneman and Tversky 1972) utilize this inventory of experience in estimating the likelihood of a hazard actualizing through its event-outcome(s)-exposure-consequence(s) chain. Even identical experiences are likely to have different meanings among people of various social positions. The relationship between perceived hazard and experience for specific hazards are examined in this section.

People of different social structural locations are likely to be characterized by different experiences. Human beliefs, attitudes, and behaviors are, in general terms, shaped by self-image. The conception of "who we are" is recognized as a product of the social structure, our integration into the social system, the values associated with that, and significant life-experiences (cf. Goffman 1970; Mannheim 1936; Merton 1968; and Holzner 1968). The frequency of life events during a given time period, the nature of the events, and even their order have been shown to be associated with significant effect on attitudes, beliefs, and behaviors (cf. Thoits 1981; Coates, Moyer and Wellman 1969; Dohrenwend 1973; Dohrenwend and Dohrenwend 1974; and Hogan 1978). These life changes have even been associated with illness and susceptibility to illness (cf. Rahe 1968, 1972 and 1974; Hinkle, et al. 1958; Holmes and Rahe 1967; Hong and Holmes 1973; Rahe, et al. 1964; and Rahe, Mahan and Arthur 1970). While typical life events include marriage, separation, reconciliation, divorce, remarriage, death of a spouse, birth of a child, beginning and ending employment, schooling, etc., life histories of severe events (e.g., the Great Depression, World Wars) have been shown to have long-term effects (cf. Elder and Liker 1982).

Life events usually represent fundamental social-system, social-structural, or social-position changes. These shifts are often associated with the stage of life and life cycle (cf. Rogers 1980 and 1983; Linton 1942; and Parsons 1942), but may also be associated with career or economic changes. While life-experiences may have fundamental social-system, social-structural, role, or position changes associated with them, they are not conceptually dependent on the occurrence of the life event. Life events may be thought of as altering fundamentally the roles played by an individual. Life-experiences, on the other hand, represent personal life histories and their associated special meanings for the individual. Life-experience may be thought of as a segment of personal life history with special meaning for the individual. These experiences are sufficiently unique, prominent, or important in the individual's data-bank of experience to fundamentally alter common or ordinary knowledge. While some of these life-experiences may represent temporary or relatively brief historical or personal events (e.g., severe economic conditions, periods of unemployment or extreme poverty, personal injury or disease, etc.), others may represent more cumulative experiences (e.g., child abuse, living in extreme or under special conditions). While life-experiences, by virtue of their unique, prominent, and important position in the personal life history, have special meaning for the individual, these experiences, even if only of a similar nature, have a shared group meaning for those who hold the life-experience in common. Furthermore, by their very nature, for example, severe economic conditions and periods of war are simultaneously experienced by groups. While these experiences are not uniformly experienced by all, they do have a shared meaning--a cohort effect.

Prior disaster experience is a shared experience. It is shared with those other individuals, families, groups, or communities affected by the same disaster. Prior disaster experience may be thought of as historical, in the sense of occurring in the past; it is more periodic than on-going, and is not necessarily cumulative. Because the individual is likely to have a clearer image of self-efficacy if a prior disaster of any kind has been experienced, prior disaster experience itself has meaning beyond the experience with the particular hazard. Previous experience with a particular hazard has been found to enhance the understanding of the process by which risk is actualized (cf. White and Haas 1975). One relatively well-documented finding suggests that prior disaster experience is directly related to warning belief with prior disaster experience being associated with higher warning credibility, and no experience with less warning credibility (cf. Mileti, Drabek and Haas 1975; Williams 1957; Mack and Baker 1961; and Drabek and Boggs 1968). Hence, whether prior disaster situations become actualized or not affects the credibility of the warning message directly. Direct experience, even though it may not be actualized, works as a partial reinforcement schedule in the perception of the hazard. Experiences with other disasters are expected to affect the perception of likelihood in the realization that "bad things can happen," and risk evaluation by clarifying our image of self-efficacy in dealing with extreme situations.

Only residential proximity with nuclear power plants seems to affect the perception and acceptability of the associated risks. This casts the relationship between hazard experience and perceived and acceptable risks in terms of experience of various kinds, and the risks associated with nuclear power plants. Rogers (1983:149) speculates, based on this finding, that "...only direct experience with the particular hazard in question affects the perception and acceptability of that risk." For the case of nuclear energy, the history has been rather accident-free, but the "...recent referenda in the Three Mile Island area concerning the potential restart of the undamaged reactor..." points out that when experience includes accidents, the effect is likely to enhance the magnitude of perceived hazard and decrease any associated acceptability of the risks. This seems to suggest that people recognize the hazards they face. The geographically diffuse nature of the operational definitions, of perceived and acceptable risk of nuclear power plant accident, and the relatively accident-free history, precluded the direct observation of experience and perceived hazard.

METHODOLOGY AND MEASUREMENT

This analysis of hazard experience and perception is based on one of three "piggyback" surveys sponsored by the Federal Emergency Management Agency and conducted in 1982 by the Gallup Organization. In the second survey conducted during the summer of 1982, 1030 adult Americans within the 48 contiguous United States were interviewed. The Gallup Organization employees a post-sample weighting procedure to the survey to represent

1500 respondents. Because we found little difference in the weighted and unweighted sample, this analysis is based on the unweighted sample. The interpretation of these data remains conceptually clear and the sampling error remains at approximately the ±5 percent level with a 95 percent confidence level for the conservative 50-50 distribution.

Substantively, for each of a series of possible hazards, people were asked if they had experienced the specific disaster. The operational variable for disaster experience is a binary variable where the value one represents the existence of an experience, and zero represents no reported disaster experience of this type. This represents only the individual's reported experience with the given hazard and not the actual occurrence of the hazard in their area. That is, it cannot be assumed that the individual experienced the given disaster in the present residence or even the more general geographic location. For example, a respondent could have experienced a hurricane at a previous residence in a Gulf of Mexico state even though the current residence is in a Northeastern or Western state. For that matter, the experience could represent an experience while on vacation in an area affected by such a disastrous event. In addition, the concept of experience is somewhat unclear. Does this refer to direct personal experiences? Disaster experience of one's immediate family? Experiences that one's friends may have incurred? Experiences of one's community? or Disaster experiences that have been heard about, via social contacts or even the media? What role do experiences of fiction play (e.g., "Silent Spring," "The China Syndrome," "The Day After," or "Countdown to Looking Glass")? The temporal dimension of such reported experiences is not operationally clear. These disaster experiences could be associated with occurrences last week, last year, several years ago or even childhood experiences. These disaster experiences could be relatively traumatic in terms of a loved one's death or injuries, property damage and the like, or have relatively little associated stress. The reported disaster experiences consist of experiences significant enough to become mentioned in a telephone interview.

In addition, the respondents were asked to report any evacuation circumstances they may have experienced. These experiences are conceptually limited by the occurrence in the respondent's past. While these occurrences are again spacially limited in the sense of not being limited to evacuation experiences in their present residential location, as with the disaster experiences, they are more specific for personal, family or household experiences. In contrast to the general disaster experience variable, the evacuation experience variable is limited temporally to a five year time-frame. It is also somewhat more specific in terms of stress inducement. The evacuation itself, at a minimum, requires crisis response action, which inherently has some heightened anxiety level associated with it. It also connotes a degree of direct impact, contingent only upon the occurrence of the hazard itself, and the resulting hazard outcomes, and consequences. The evacuation variable is operationally a binary variable where one represents an evacuation experience in the previous five years, and zero represents no such experience.

The estimated likelihood of occurrence of the given disaster is represented as "very likely," "somewhat likely," "about a 50-50 chance," "somewhat unlikely," "very unlikely" or "never." In this sense, the operational definition of the likelihood estimate may be derived by setting the "very likely" response equal to one, the "somewhat likely" response to .75, the 50-50 chance response equal to .5, the "somewhat unlikely" response to .25, and the "very unlikely" and "never" responses equal to zero. The operational definition has the added feature of making the respondents estimate "mirror" the actual probabilities in the sense of having an appropriate range, and the 50-50 mid-point of the scale reflects a degree of specification to the likely and unlikely ends of the likelihood estimates. However, it is not conceptually clear that "very likely" is adequately represented by the likelihood estimate of one, or put another way, "almost certain to occur." The unlikely extreme is conceptually somewhat clearer in that the "very unlikely" response is joined with the "never" response as the zero likelihood estimate of the hazard occurrence. These estimates are spacially and temporally specific: "in your area" and "in the next five years." Furthermore, these estimates do not include any hazard consequence(s), such as personal damage or destruction of property, so the operational specification of the estimated likelihood of these specific disasters is conceptually clear.

Regional Distribution of Hazard Recognition and Experience

The geographic distribution of recognized hazards reflects, to some extent, the distribution of hazards themselves. The distribution of hazard experiences and exposure rates (Rossi, et al, 1983) among regions of the United States indicates the relative accuracy of the hazards being recognized by the general public. Natural hazards are presented in Table 1 in terms of exposure rate, reported experience, and likelihood estimates associated with natural hazards of relatively extended onslaught, including floods and hurricanes, and natural hazards of relatively rapid onslaught, including tornadoes and earthquakes. Technological hazards, including gas line breaks, chemical accidents and dam failures, are presented in Table 2. This cross-cutting dimension of hazard recognition by geographical distribution implies that people generally recognize the hazards they face, if only in a common sense way. Some (e.g. flood and dam failure) are rather diffuse among all the regions, while others (e.g. hurricanes, tornadoes and earthquakes) are relatively concentrated in one or more regions. Rogers (1984) describes these distributions in detail and discusses how they relate to a common-sense understanding of the hazards. In general, the regional correlations are quite low and substantively insignificant. The methodological problems with these rather crude measures may explain many of the non-significant relationships described.

HAZARD EXPERIENCE AND RECOGNITION

The correlations between reported experiences with hazard and the estimated likelihood of common hazards are presented in Table 3. Of the 64 correlations presented, 28 are not significant at the .10 level and 7 are marginally significant at the .10 level but not the .05 level. The five largest correlations between experiences and perceived likelihood of hazard actualization are between experience and estimated likelihoods of the same hazard. The largest correlation is between experience and estimated likelihood of the somewhat recurring flood (.343). This certainly reflects the kind of hazard recognition associated with living near a river system, such as in conjunction with emerging disaster subcultures. The second largest correlation reflects the relative predictability and seasonal nature of hurricanes. The correlation between experience and estimated likelihood (.320) clearly shows that people recognize the hazards they have faced in the past and that they expect to face similar hazards in the future. Tornadoes are less predictable in the sense of where and when they will touch down even after a tornado producing weather system is detected -- a fact that scientists through technology are working to remedy. Yet the correlation between experiences and estimated likelihood of tornadoes is third highest (.266). The next

Table 1

Natural Hazard Likelihoods and Experiences by Region of the Country

Region	N	Flood	Hurricane	Tornado	Earthquake
New England					
1)	1032	18.4	18.4	31.0	1.0
2)	65	18.5	3.1	4.6	0.0
3)	65	37.7	52.0	29.1	23.0
Middle Atlantic					
1)	2113	31.7	22.2	41.2	4.3
2)	167	10.8	4.8	1.2	0.0
3)	167	31.1	29.8	19.4	12.0
East N. Central					
1)	2825	13.8	10.6	98.8	8.1
2)	210	14.3	1.0	12.9	0.0
3)	210	35.0	11.2	73.3	15.9
West N. Central					
1)	1188	21.0	8.4	89.2	4.2
2)	83	26.5	1.2	16.9	0.0
3)	83	40.4	11.0	75.6	2.5
South Atlantic					
1)	2384	13.4	36.5	42.4	2.5
2)	186	13.4	16.1	3.2	0.0
3)	186	34.2	47.2	49.4	12.9
East S. Central					
1)	942	19.1	62.6	41.7	7.4
2)	61	32.8	1.6	19.7	0.0
3)	61	44.7	19.5	71.7	25.0
West S. Central					
1)	1265	19.8	34.8	78.3	3.2
2)	83	21.7	18.1	7.2	0.0
3)	83	54.8	42.0	70.4	9.7
Mountain					
1)	405	14.8	4.9	42.0	17.3
2)	36	36.1	2.8	8.3	5.6
3)	36	53.5	1.4	39.6	37.5
Pacific					
1)	838	10.7	6.6	26.3	84.7
2)	139	16.6	0.7	0.7	9.4
3)	139	39.1	6.3	9.2	79.0

1) Hazard Victimizations (1970-1980) per 1000 Households Reported by Peter Rossi et al in VICTIMS OF THE ENVIRONMENT Plenum Press New York, 1983.

2) Percent Reporting Hazard Experience in 1982 Gallup Survey.

3) Estimated likelihood of Hazard Actualization in respondent's own area and within five years, from 1982 Gallup Survey. Responses are "very likely" (scored 100), "somewhat likely" (scored 75), "50-50 chance" (scored 50), "somewhat unlikely" (scored 25), "very unlikely" and "never" (scored 0).

highest correlation is between the experience and estimated likelihood associated with the less predictable earthquake (.183). The fifth largest correlation occurs between the estimated likelihood and prior experience with chemical accidents (.173). The magnitude of the relationship seems

Table 2

Technological Hazard Likelihoods and Experiences by Region of the Country

Region	Gas Line Break	Chemical Accident	Dam Failure
New England			
1)	41.0	45.6	7.9
2)	0.0	1.5	0.0
Middle Atlantic			
1)	59.3	44.8	10.2
2)	2.4	1.8	0.6
East N. Central			
1)	58.3	48.8	9.6
2)	1.4	4.8	0.0
West N. Central			
1)	51.2	44.8	9.0
2)	0.0	4.8	1.2
South Atlantic			
1)	46.6	42.9	9.6
2)	1.6	6.5	0.0
East S. Central			
1)	39.2	43.4	17.6
2)	1.6	13.1	0.0
West S. Central			
1)	55.6	47.5	13.5
2)	4.8	8.4	1.2
Mountain			
1)	56.4	53.5	31.3
2)	11.1	0.0	0.0
Pacific			
1)	56.6	53.5	25.2
2)	1.4	2.2	7.2

1) Likelihood estimate consists of Respondent's estimate of the occurrence of the disaster in their own area and within five years. Responses are "very likely" (scored 100), "somewhat likely" (scored 75), "50-50 chance" (scored 50), "somewhat unlikely" (scored 25), "very unlikely" and "never" (scored zero).

2) Experience variable equals one if Respondent reports having experience with disaster, zero, otherwise.

to be a function of the predictable nature of the hazard, with the highest correlation being between experience and perception of hazards of a highly predictable nature, and the significant, but smaller correlation, being among hazards of recognized areas but of little predictability. Hence, it appears that people recognize the hazards they face, and estimates of the likelihood of future occurrences are based on prior experiences with these same hazards.

Comparing the even more abstract recognition of being in potential risk areas associated with nuclear attack confirms this trend. Each

Table 3

Correlations Between Disaster Experiences and Likelihood Estimates
1982 Gallup

	Likelihood Estimates							
Experiences**	1.	2.	3.	4.	5.	6.	7.	Nuclear Attack
1. HURRICANE	.320	NS	.057	-.071	-.109	NS	-.109	NS
2. TORNADO	-.080	.266	.079	NS	NS	NS	NS	NS
3. FLOOD	NS	.055	.343	.056	NS	NS	-.043	.041
4. DAM FAILURE	NS	NS	NS	NS	NS	-.041*	NS	-.056
5. EARTHQUAKE	-.063	-.123	NS	.046*	.183	.055	NS	.057
6. CHEMICAL ACCIDENT	NS	.081	NS	.046*	NS	.173	.062	NS
7. GAS LINE BREAK	NS	NS	.045*	.042*	NS	.089	.109	NS
SOME DISASTER EXPERIENCE	.078	.097	.279	.051*	.046*	.120	NS	.051

NS - not significant at .10 level

*Not significant at .05 level

**Experiences are binary variables representing either expressed experience or evacuation due to specific disaster

respondent is associated with a particular county based on the reported Postal Service Zip-code and then related to nuclear attack risk areas as specified by the Department of Defense (TR-82). In comparing this objective risk area estimate with the respondent's perception of the likelihood of the local area being a target area, we find that those respondents objectively at risk place their likelihood at .608, while those objectively not in target areas place their target area likelihood at only .395. Hence, people tend to recognize that, while hazards affect all people "equally" in the sense of status, they also recognize their own susceptibility to specific hazards, including the most abstract and never actualized nuclear attack.

LINKING HAZARDS

This analysis examines direct experience with, and likelihood estimates of specific hazards. Hazard experience is operationalized as a general or evacuation event of a specific hazard. Table 4 presents the correlation among eight specific and two more general experience indicators. Of the 45 correlations among these variables, about half (21) are significant at the .10 level. Of these correlations, only the

Table 4

Correlations Among Disaster Experiences**
1982 Gallup

		2.	3.	4.	5.	6.	7.	8.	9.	10.
1.	HURRICANE	NS	.097	NS	NS	NS	.065	NS	NS	.309
2.	TORNADO		.149	NS	NS	.080	NS	.057	-.052	.334
3.	FLOOD			.133	NS	NS	NS	.045*	NS	.507
4.	DAM FAILURE				NS	NS	NS	NS	NS	.080
5.	EARTHQUAKE					NS	.192	.150	NS	.139
6.	CHEMICAL ACCIDENT						.043	.087	NS	.244
7.	FIRE							.122	NS	.331
8	GAS LINE BREAK								NS	.169
9.	OTHER									.267
10.	SOME									

NS - not significant at .10 level

*Not significant at .05 level

**Experiences are binary, variables representing either expressed experience or evacuation due to specific disaster

correlations between the individual hazard and having some disaster experience have significant magnitudes. These correlations range from .080 to .507 and may be thought of as measuring the contribution of each individual hazard experience to the overall disaster experience profile. The highest correlation among hazard experiences with having some experience is between earthquakes and fires at .192. The correlation between earthquakes and gas-line breaks (.150), tornadoes and floods (.149), fire and gas-line break (.122) comprise the most significant relationships. These correlations represent logical connections among hazards of various kinds; a further example of this is the .133 correlation between flooding and dam failure.

The correlations among the estimated likelihoods for the various hazards, presented in Table 5, are on the whole more significant and of greater magnitude than those among the actual experiences. The largest correlation reflects the relationship between estimated likelihood of a chemical accident and a gas-line break (.456). The correlation of nuclear and chemical accident (.443) represents the second largest correlation. While these two relationships seem to suggest the recognition of the similar technological context of these hazards, the correlation between the likelihood estimates for a potential nuclear accident and gas-line

Table 5

Correlations Among Likelihood Estimates
1982 Gallup

	2.	3.	4.	5.	6.	7.	8.	9.
1. HURRICANE	.082	.156	NS	-.089	.065	NS	.065	.055
2. TORNADO		.158	NS	-.139	.137	.130	.057	.106
3. FLOOD			.263	.099	.174	.160	.148	.088
4. DAM FAILURE				.234	.185	.126	.214	.098
5. EARTHQUAKE					.213	.182	.145	.065
6. CHEMICAL ACCIDENT						.456	.443	.174
7. GAS LINE BREAK							.160	-.109
8. NUCLEAR ACCIDENT								.141
9. NUCLEAR WAR								

break is only (.160). The estimates for possible dam failure and potential nuclear accident seem to represent the overall relationship of hazards involving large-scale technology, but the correlation of .214 may only reflect the physical relationship of many nuclear power plants that are located near river systems that have upstream dams. The completely logical relationships between dam failure and earthquakes (.234), and dam failure and flooding (.263) are reflected. Furthermore a relation seems to be reflected between chemical accidents and earthquakes (.213). A considerable structure, that was only modestly reflected among experience indicators, is apparent in the likelihood estimates.

CONCLUSIONS

Lay-people reduce risk uncertainty by delineating relatively risky situations from those deemed less risky. Drawing on centuries of human experience, lay-people use actualized hazards in the recognition of risky and potentially risky situations. Hence, public recognition of hazard rests on a foundation of social values and experience. This research examines the general relationship between prior disaster experience and recognition of hazard. While recognizing that lay-people cannot use actual experience with hazard in identifying many technological risks, which tend to veil the nature, severity and likelihood of the associated risks, the public seems to recognize globally the hazards they face.

This research takes an important first step in understanding which experiences, and for what hazards, public recognition of risk is linked to actual hazard experience--particularly those that are relatively common, predictable or familiar. While the public recognition and estimation of risk is less than precise, in terms of expert risk assessments, the resulting distributions of recognized hazard bears a marked resemblance to patterns of hazard exposure rates. It is in this sense that we conclude that people tend to recognize, at least in common terms, the hazards they face. In addition, the pattern of linking between hazard likelihoods and experiences suggests that people understand, at least in common-sense terms, the nature of potential threat.

While this research has foccussed on direct experience with similar and related hazards, much remains in the examination of more vicarious experience and the recognition of hazard. Many interesting questions remain: How severe does an experience need to be in order to affect public recognition and perception or risk? Do these experiences need to be personal? In direct familial relationships? Within the community? Or within society at large? How do severity and directness interplay to impact on recognition and perception of risk? In essence, under what conditions does the public use their experience, and that of others, in recognizing potentially risky circumstances?

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