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COMMUNITY RESPONSE TO EARTHQUAKE THREAT IN SOUTHERN CALIFORNIA

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PART SIX
ETHNIC AND RACIAL DIFFERENTIALS
and
PART SEVEN
VULNERABILITY ZONES AND EARTHQUAKE SUBCULTURE

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This volume is part of a study investigating individual and community response to earthquake threat in southern California. The overall objective is to provide a basis for understanding community response to earthquake predictions released to the public. This part of the study addresses the question of whether minority ethnic and racial groups view the threat of an earthquake differently from majority groups, and whether minority groups differ among themselves. Certain variables believed to affect such groups' responses to earthquake forecasts are examined. Described is a comparative study of Black and Mexican-American response to the prospect of a disastrous earthquake in southern California. The influence of a Spanish language newspaper, "La Opinion," is compared to that of English language newspapers to help understand differences in the exposure of Spanish-speaking and English-speaking residents to earthquake news and issues. Black, white Anglo-American, and Mexican-American populations are compared, and conclusions are drawn on their responses to earthquake threat. Also examined are the nature and selection of special zones; methods of analysis and "special vulnerability zones"; earthquake coverage in the "San Fernando Valley News;" the San Fernando earthquake damage zone; and the scope of earthquake themes in local cultures.

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COMMUNITY RESPONSE TO EARTHQUAKE THREAT IN SOUTHERN CALIFORNIA

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PART SIX

ETHNIC AND RACIAL DIFFERENTIALS

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1980

THE REPORT

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Part Six was written primarily by Ralph Turner. Gloria Vargas was principally responsible for monitoring and interpreting newspaper coverage in La Opinion, with contributions by Saul Solache. Jill Kiecolt was the chief statistical collaborator in the analysis and prepared drafts for some methodological portions of the manuscript.

PART SIX

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BLACKS, MEXICAN AMERICANS, AND THE ANTICIPATION OF EARTHQUAKES

CHAPTER 1

The question of whether minority ethnic and racial groups view the threat of an earthquake differently from majority groups and whether minority groups differ among themselves has important implications both practically and theoretically. Practically, it is important for the people who are responsible for the safety of the community to know whether groups differ in their understanding of the earthquake threat, in their preparations for dealing with an earthquake, and in their accessibility to communication in an emergency. With the large populations of Blacks and Mexican Americans in southern California it is especially important that public policy regarding earthquake risk and earthquake warning not be shaped solely on the basis of what is known about the majority White Anglo population.

Theoretically, the presence of large minority ethnic and racial groups opens up to investigation a great many interesting and important issues. On the one hand, these issues have to do with the variables that affect how people respond to uncertainty and threat. On the other hand, they have to do with developing a fuller understanding of the characteristics of the ethnic and racial groups themselves and their relationships to the society at large.

This investigation is intended to shed light on both types of questions. We hope to learn more about the conditions that affect how segments of the

community will respond to the threat of community-wide disaster and to contribute to an understanding of whatever is distinctive about the way of life of Blacks and Mexican Americans in southern California.

Variables Affecting Response to Earthquake Forecasts

Four broad sets of conditions that affect the way in which people deal with the prospect of disaster appear to be affected by membership in minority racial and ethnic groups. The first of these consists of the customary patterns for dealing with risk and uncertainty. In the case of an earthquake forecast, it is not only the prospect of disaster which is important, but the uncertainty of that prospect. No one can be sure that disaster will actually strike. Even if there is certainty that disaster will strike, there is no assurance that it will strike the particular individuals. There is no way to know precisely when disaster will strike or precisely where or with precisely what impact. Hence, the critical consideration is the fact that the prospect of an earthquake means the anticipation of danger marked by comprehensive and sustained uncertainty. There is good reason to believe that ethnic and racial groups may differ in the characteristic ways in which they deal with this kind of uncertainty.

Studies of different ethnic groups have called attention to differences in time perspective. Some groups look disproportionately toward the past and are concerned with tradition and with continuity over long periods of time, so that momentary disruptions are of less concern than the possibility of long term reorientations. Other groups have been observed to live very much in the present time perspective, being very little concerned with events that may happen in the future. Still other groups are strongly oriented toward the future, frequently willing to mortgage the present for the sake of

a better future. The economically and politically dominant segments of American society have generally been characterized as having such a future time perspective, placing great emphasis on making and implementing plans for the future and emphasizing values such as achievement which require discipline and sacrifice in the present for the sake of something more highly valued in the future. Age and socioeconomic status have frequently been thought to affect time perspective. The higher socioeconomic levels have generally been characterized as more future oriented while the economically disadvantaged groups are so thought to be preoccupied with the present that they cannot concern themselves a great deal about the future. Indeed, a considerable degree of security about the present may be a necessary condition for the development of a strong orientation toward the future. The orientation toward the present or the future is also affected by the human time-span. It is often supposed that older people lose interest in planning for a future which they are not likely to see. Younger people may plan enthusiastically for the future on the assumption that they will see the plans come to fruition. Older people, on the other hand, may be more concerned with survival and enjoyment from day to day because they are aware that tomorrow may not come for them. Many of the discussions of ethnic groups have referred to differences in time perspective and we shall look for evidence of such differences as we proceed with the analysis of our data.

Another element in the pattern of dealing with risk and uncertainty is the disposition to deal with these conditions through magic or religion or through such secular approaches as human technology. Again, comparisons of different cultural and subcultural groups and of different classes in society have repeatedly called attention to differences in reliance upon magic as contrasted with technology as a way of controlling the uncertainties of the future.

A second major variable affecting the response to earthquake forecasts should be the relationship to the social and political establishment and to authority in general. Quite critical in how people respond to forecasts of danger and instructions on how to prepare themselves is the extent to which authority is trusted and looked to for guidance and support. With a high degree of trust, warnings are more likely to be taken seriously and there should be a greater disposition to follow directions and participate in community-wide plans. Where distrust is extensive, there is likely to be both a suspicion that scientists or public officials are not telling all that they know, that they are withholding warnings of disaster from the public, and on the other hand that they are not to be trusted when they issue warnings. The issue of trust is not simply a matter of trust contrasted with mistrust. Mistrust may be related to a judgment of evil intent or a judgment that authorities are well-meaning but incompetent. In addition, there may be a general dimension which is not so much a matter of trust and mistrust as simply of a tendency to look toward established authority for guidance or a tendency to look elsewhere.

The third important variable that should affect response to earthquake forecasts is involvement in communications systems. What people know or think they know, and the opportunities they have to test their own judgment, are strongly affected by the extent to which they are involved in various kinds of communications systems. Different kinds of mass media provide different emphases in the messages they convey. Informal interpersonal communication operates quite differently from the more formal and one-way communication of the mass media. Studies on the diffusion of information have shown the importance of involvement in informal communication networks on awareness of various kinds of information. The quality of the network in which people

are involved also affects the kind of information that is transmitted, and the extent to which mass media and informal communication work in reciprocity has an important effect. Studies have shown, for example, that children who listen to frightening television programs alone are more likely to have sleep problems than children who watch them and discuss them in the company with other children. Hence, there is reason to expect that differences in the communication patterns to which people are exposed will have wide-ranging effects on the response to earthquake threat. Studies of ethnic groups and other minority groups have often suggested that the patterns of communication most characteristic of one group are different from those that prevail in another.

Finally, response to earthquake forecast is probably affected by the nature and availability of social support systems within the ethnic or racial community. The most fundamental support system for most people in human societies is the family. Ethnic and racial groups differ in the extent to which members are intimately involved in a family complex and in the extent to which that complex is a one-generational, two-generational, or three-generational family. Groups differ in the extent to which the family system is able to give support when it is needed to family members. Groups also differ in the extent to which the family multiplies the lines of communication between each individual member and the outside world. Some family systems are relatively permeable in the sense that each family member has linkages to the outside world so that each family member in effect extends the range of contacts and resources for each other member. In other family systems, the family is relatively inwardly turned, so that the members may provide strong mutual support but may even serve as a buffer insulating each other from communication and access to resources from outside the family. It seems apparent that the character and

availability of family support systems will affect the way in which people will interpret and respond to earthquake forecasts.

The peer community is potentially another important support system. There is a question as to whether particular peer groups serve more as support systems or control systems. Nevertheless, it is to friends and neighbors and often to co-workers that people turn for advice and sometimes for help. Again, racial and ethnic groups may differ in the extent to which there is a peer group of friends and neighbors to provide emotional support to deal with anxiety and uncertainty. The nature of the work relationship likewise determines the extent to which there is a peer group of friends and neighbors to provide emotional support to deal with anxiety and uncertainty. The nature of the work relationship likewise determines the extent to which co-workers are available as a support group.

All four of these broad variables are thought to differ among racial and ethnic groups. In our comparison of Blacks and Mexican Americans with a control group of White Anglos in Los Angeles County we shall look particularly for evidence of differences in these dimensions.

The Analysis of Minority Groups

In the analysis of minority ethnic and racial group characteristics, it is frequently useful to make a distinction between subculture and life situation. In practice it is often difficult to disentangle these two, but analytically and causally it is important to make the distinction. By subculture, we refer to all those distinctive patterns which are conveyed to each new member of the community by those who are already members. This includes the distinctive language and accent, the food pattern, tastes, values that are taught to children in one ethnic or racial community. The

important thing is that subcultural elements are socially transmitted and are acquired primarily because they are the accepted, sometimes socially required and other times merely taken for granted, ways of thinking, feeling and acting in the community under investigation. Subcultural elements do change and the fact of social transmission does not mean complete rigidity, but it does mean that when there is change, many individuals in the group accept the changing patterns because those are the patterns that are conveyed to them by others in the group. By life situation, on the other hand, we refer to the ways in which people respond to the somewhat distinctive circumstances of life to which a large or disproportionate share of members of a given group are exposed. Each individual must cope with the situation in which he finds himself. The individual copes in relation to opportunities. If there are many opportunities, imaginative and versatile coping patterns are to be expected. People deal with the immediate and pressing demands of life, the conspicuous and urgent risks of their situation. They develop attitudes toward authority based upon their distinctive relationship to authority. There are two points being made here: first, those patterns that develop as a consequence of life situations are not simply learned because of the example presented by other people, but because in some way or another they work for the individual in the particular situation in which he or she finds himself. People in different situations, then will develop different patterns of feeling, thinking and acting. Second, the uniformity of response in a community may arise from the fact that many members of the community find themselves in the same situation, confronted with the same risks and social pressures and with the same range of opportunities available to them. In this sense, each individual member is finding what works for him. Since many individuals are living in the same situation, it turns out that many

individuals find the same solutions to their shared problems.

It is critical to the theory of ethnic and racial minority groups to realize that there is a dynamic interrelationship between the operation of subcultural and life-situational effects in generating a shared set of outlooks on life. To a large extent, the subculture serves to transmit and generalize those patterns that have been developed as individual ways of coping with the shared life situation. The receptiveness of group members to subcultural patterns is determined in part by proclivities towards imitation, social pressure and similar mechanisms, but it is equally if not more determined by the fact that the patterns transmitted through the subculture turn out to be fairly well attuned to the life situation in which most individual members find themselves. When subcultures change, it is probably most often because of changes in the life situation, so people discover that other coping patterns seem more adequate than the traditional ones. Under such circumstances, after initial resistance, the new patterns begin to take over and displace the old ones in the subculture .

The common features of the life situation of typical members of disadvantaged minority groups include such things as inferior economic status, inferior social status, relative lack of social power and political power, less access to major communication networks, and a general deficiency in resources needed for operating in the mainstream of society. The assumption is that each minority group, then, will develop patterns for dealing with the minority life situation. We shall then necessarily pay a great deal of attention to the features of Black and Mexican American attitudes and behavior that appear to relate specifically to their disadvantaged minority status in American society.

However, there is not just one way to cope with a given life situation

and this is where traditional subcultures become important. Mexican Americans brought a distinctive culture with them as part of their Latin heritage. In coping with the contemporary life situation, people draw upon the understandings and resources available to them in their extant culture. To the extent to which Mexican Americans have brought a distinctive social system and distinctive values and attitudes, their solution to problems like poverty and the risk of uncertain disaster will be different from people in a similar situation from a different cultural background. Consequently, even if we find that Blacks and Mexican Americans are not greatly different in their socioeconomic standing in southern California, we may well find distinctive differences in the way in which they cope with the prospect of an earthquake.

Two observations may clarify this point. First of all, observed subcultural differences may not be strictly responses to the current life situation but may reflect the persistence of a traditional pattern of culture which developed originally out of quite a different life situation but which has served to provide meaning to the current situation. Second, an important part of the socio-cultural heritage of a group are institutional forms such as the church and the family that persist largely by adapting to changing life situations. Thus, the church may persist in one group by constantly adapting to the life situation of a significant portion of the group members. Similarly, a basic pattern of family organization may survive by undergoing changes so that it continues to mesh with the life situation group.

Description of the Groups

The United States Bureau of the Census estimated the population of Los Angeles County as a little in excess of seven million persons at the time of the 1970 census. Using slightly different base population figures, census officials estimated the Black population as 762,844, or

10.8 percent of the total, and the combined Spanish-language and Spanish surname population as 1,289,311, or 18.3 percent of the total. If we disregard the vexing problems of underenumeration of both Blacks and Mexican Americans, exaccerbated in the latter case because of large numbers of illegal aliens, the population of Mexican ancestry is less than the census estimate, which includes a substantial number of migrants from other Latin countries and descendents of Spanish immigrants to North America who never lived under Mexican jurisdiction. In our basic field survey sample (before oversampling), 181 respondents identified themselves as Black or Negro or African-American, constituting 12.5 percent of the total sample. This figure is in excess of the census estimate seven years earlier. Respondents identifying themselves as Mexican, Mexican American, or Chicano total 188, or 13.0 percent of the entire sample. Another 46, or 3.2 percent, answered the question, "How would you describe your racial background or heritage?" with terms that were classified as "other Latin." The combined 16.1 percent is a little below the census estimate, which in turn would have been higher by 1977.

A great deal has been written about Blacks in the United States, though most of it deals with either the poverty-stricken, the disorganized, or the militant segments, rather than essaying a balanced portrait. Occasional works, however, have stressed the development of a middle class business and professional class, with little in common with the bulk of the Black population except for persisting prejudice and discrimination directed against them in spite of the socioeconomic standing. The most controversial issue in depicting Blacks has to do with family composition, namely, whether there is a disproportionate number of single-adult, female-headed households with children in the Black population after appropriate controls are entered

for socioeconomic status, and whether this type of family environment is less effective than the customary two-parent household as a setting for child socialization. We are sensitized by existing discussions of the Black community to look for possible differences from the White Anglo population in relationship to the social and political establishment and to authority in general, and in the nature and availability of social support systems.

Characterizations of the Mexican American community typically emphasize the cohesiveness of the extended family and the persistence of traditional peasant values and ties to the Mexican homeland. Striking differences are often noted between the more urbanized and secularized population of Los Angeles and the more traditional Mexican American populations of Texas and the Southwest. In spite of Mexican nationalism, accumulating evidence indicates a surprisingly positive attitude toward authority and the American state, contrasting markedly with Blacks. Acculturated Mexicans can escape their ethnic identity by "becoming" Spanish, in a way that Blacks cannot escape their racial identity. Educationally and politically Mexican Americans have made less headway than Blacks in the United States, but prejudice against them is generally less intense and unrelenting in most American communities.

We shall delay fuller discussion and documentation of relevant characteristics of the two groups until we reach the stage of interpreting our findings.

REFERENCE

U.S. Bureau of the Census. 1972. 1970 Census of Population and Housing: Census Tracts, Los Angeles and Long Beach.

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CHAPTER TWO

DATA AND METHOD

The comparative study of Black and Mexican American response to the recently heightened prospect of a disastrous earthquake in southern California was conceived as part of a larger study of community-wide response. The comparative study uses principally data gathered in order to study community-wide response, supplemented selectively with data gathered specifically for the comparative study. Consequently it is appropriate to begin with a brief review of the community-wide study.

The occasion for the investigation was the announcement in February, 1976, of a vast uplift along the San Andreas Fault, close to Los Angeles. Although no true prediction was issued, scientists indicated that similar uplifts had preceded the occurrance of destructive earthquakes in the past. The California Seismic Safety Commission officially found that "the uplift should be considered a threat to public safety and welfare in the Los Angeles metropolitan area." This near prediction was followed by recurring public discussion of the prospect of a great earthquake in Los Angeles County in the near future. The purpose of the investigation was to learn what we could about how the public responded to this threatening but uncertain information, as a clue to how they might respond later to more definite earthquake predictions.

The principal source of data was an interview administered in the respondents' homes to a representative sample of 1450 residents of Los Angeles County during January, February, and March of 1977. The interview

schedule was designed to ascertain what people remembered and understood about the earthquake threat, how seriously they took the earthquake prospect and how they felt about it, their involvement in various kinds of communication about the earthquake danger, their attitudes toward science and both scientific and nonscientific predictions and forecasts, what personal preparedness measures they had taken, their disposition to see the earthquake threat as strictly an individual and family survival problem or as one requiring collaborative community action and altruism toward especially endangered populations, and what they expect and think of government in this realm of activity.

As a complement to the survey data, newspaper and other media content was monitored from the beginning of 1976. It was not feasible to monitor television and radio completely or systematically, but earthquake specials and important news broadcasts were monitored. Six newspapers, however, were monitored completely for all items dealing with any aspect of earthquakes. The two leading metropolitan dailies, three selected community newspapers, and the major Spanish-language daily, La Opinion, were monitored. This made it possible to compare coverage and treatment of earthquake topics in the Spanish-language press with coverage and treatment in the English-language press. A similar effort to monitor the leading Black newspaper, The Sentinel, was abandoned after a search through all issues for a period of six months netted only one item dealing with earthquakes.

The primary sample and ethnic special samples. The primary sample employs the sampling frame developed by the UCLA Survey Research Center for the Los Angeles Metropolitan Area Survey (LAMAS). The LAMAS is a multi-client household survey conducted semi-annually by the UCLA Institute for Social Science Research. The LAMAS sampling frame contains approximately 20,000 computer-

readable addresses sampled from the county on a probability selection basis. Samples of housing units (HUs) drawn from the frame are representative of Los Angeles County. Samples from the frame may be characterized as probabilities-proportional-to-size three-stage samples. The first step in constructing the 1976 frame was to obtain recent estimates of numbers of HUs in each census tract to serve as sampling measures-of-size; this was accomplished by making adjustments to the 1970 Census counts using County Regional Planning data derived from building starts and demolitions. In the first-stage of the sample, 108 primary sampling units (PSUs) or census tracts were selected and stratified by geographical area, racial/ethnic mix, and lifestyle characteristics. Two second-stage units, typically blocks, were sampled from each PSU. The third-stage units are housing units (HUs) which are sampled from blocks independently for each survey that utilizes the frame. In our basic sample a total of 2,509 households were selected, with 1450 completed. The use of the LAMAS frame gives us a representative sample of County residents and permits generalization of findings concerning popular response to the earthquake threat in the metropolitan area.

Before the field survey was conducted, based on the primary sample as projected, an attempt was made to estimate the number of Mexican Americans and Blacks who would fall into the sample. The objective was to oversample as necessary in such a way as to insure at least 200 Blacks and 200 Mexican Americans who could constitute special samples for the comparative study. Initially, the estimate of Mexican Americans had to be based on the incidence of Latin surnames, since this was the only relevant information available. It was determined that more than 200 persons with Latin surnames would be drawn in the primary sample and no oversampling would be necessary. It was estimated, however, that the Black sample would

fall considerably short of 200, so oversampling was necessary.

Oversampling for Blacks was conducted in all primary sampling units in which population estimates included more than ten percent Black, according to 1970 Census data adjusted by more recent elementary school records. In addition, all primary sampling units in which five percent or more of the completed interviews from a study then in progress were Black were included in the oversampling frame. Because of high rates of refusal to be interviewed by Blacks in recent surveys, 565 addresses were identified for oversampling in these primary sampling units. Because of favorable response rates, 111 interviews were completed by oversampling, for a 56 percent completion rate among eligible households. Added to the 181 Blacks in the primary sample, this produced a total sample of 292 Blacks for use in the ethnic and racial comparison study.

In the primary sample 32 Blacks were drawn from tracts that had not been oversampled, raising the possibility that the oversampled respondents might not be representative of the same population as the Blacks in the primary sample. Comparisons were therefore made between the two samples of Blacks on age, sex, marital status, presence of children in the household, education, occupational socioeconomic status, household income, experience of personal loss, personal experience with disaster agents other than earthquakes, fear of earthquakes, salience of earthquake concern, number of earthquake forecast announcements heard, whether the respondent mentioned the Uplift without interviewer prompting, expectation of a damaging earthquake within a year, awareness of specially endangered groups, range of earthquake topics discussed with others, personal preparedness actions taken or planned, and attitude toward government expenditure for earthquake hazard reduction.

On the basis of t tests and Chi-square tests as appropriate, none of the differences was significant. Accordingly, the two samples were combined into a single sample of 292 Black respondents for the ensuing analysis.

Because of the oversampling procedure the probability of a given Black's being included in the final sample was greater than the probability for a given Mexican American or White Anglo in the control group. Accordingly, a system of weighting was introduced for use when estimating the significance of observed differences among the groups.

The original estimates for Mexican Americans in the primary sample was made on the basis of Latin surname, since this is the only basis on which the Census Bureau estimates the Mexican population. In the survey, however, respondents were asked to identify their "racial background or heritage" from a list that included both "Mexican/Mexican-American/Chicano" and "Other Latin American." The original plan was to combine the 188 Mexican Americans and 46 "Other Latins" into a single special sample of 234 respondents. However, the two groups were first compared for a wide range of variables to determine whether this step was justified. In most respects the two groups were alike. Nevertheless the educational attainment of Other Latins was higher, the proportion of households with children was smaller, and there were some differences in newspaper readership patterns. In addition, without information on place of birth, there was a possibility that some of the non-Mexicans came from quite different Latin cultural settings. Hence the decision was made to use only the 188 Mexican Americans in the special sample.

To complete the units for comparison a control group was constructed, consisting of all the respondents in the primary sample who identified themselves as White or Anglo or Caucasian. Besides Blacks, Mexican Americans, and Other Latins, this criterion eliminated respondents who called themselves

Asian or Asian American or Oriental, Native American or American Indian, and those who identified themselves as "Other." The resulting sample of 960 respondents will be referred to as White Anglos or as the control group.

The distribution of the three groups by communities within Los Angeles County probably reproduces reasonably faithfully the concentration and dispersion of ethnic and racial groups in the entire population. White Anglos are present in almost every named community. Thirty of the 96 communities have only White Anglo representatives in the comparison study. Many more communities have only a single ethnic representative. Blacks and Mexican Americans tend to be heavily concentrated in a few communities. Blacks and Mexican Americans tend not be located in the same communities. Of the 96 communities, Blacks were present in 37 and Mexican Americans in 45. Only fifteen communities contained both Blacks and Mexican Americans, and thirteen of them contained White Anglos as well. Eight communities are exclusively Black and two are exclusively Mexican American. The largest numbers of Blacks are concentrated in Watts, Carson, West Los Angeles, Compton, Vermont Knolls, Long Beach, and Crenshaw. These are primarily in south central Los Angeles and adjacent areas. Mexican Americans disproportionately name East Los Angeles, with El Sereno, Huntington Park, Montebello, and La Puente following. Mexican American areas are concentrated in and around eastern Los Angeles.

Method of analysis. The principal method of analysis will be to compare percentage distributions among the three samples on a wide range of variables. This method is preferable to more sophisticated techniques because it allows the investigator and the reader to inspect the distributions for detailed similarities and differences among the three groups. The relationships between variables and ethnicity are often not linear, and inspection for patterns as well as overall relationships frequently generates clues to the meanings of specific differences. At the same time, all sets of distributions are tested

for the significance of differences by the relatively conservative Chi-square test. Precise probability levels should not be taken seriously. But the general guideline followed has been to accept relationships that are significant at the .01 level as indicative of universe relationships, while treating relationships that fall between the .05 and .01 criterion as of borderline significance and subject to very cautious interpretation. In addition, selected variables have been subjected to analysis of variance across the three groups.

The comparison among the three groups includes both variables of response to earthquakes and earthquake threat and variables that tap the more general subcultures and life situations. In general the plan is to look first for similarities and differences in subculture and life situation as the background against which to understand differences in earthquake response. However, the line between the two types of variables is not a sharp one, so the transition will take place by degrees rather than abruptly. For example, a measure of fatalism toward earthquakes undoubtedly mixes a more generalized attitude of fatalism and specific attitudes toward earthquakes. Attitudes toward scientific prediction likewise merge general attitudes toward science with specific attitudes toward earthquake prediction. And patterns of communication concerning earthquakes undoubtedly follow to a great extent the individual's pattern of communication on a wide range of other topics.

In general we shall be looking for clues to observed differences in response to earthquake threat in the more general subcultural and life situational differences among the groups. For the most part we shall be limited to impressionistic grounds for linking the two sets of variables. However, a limited number of critical variables will be selected for further analysis as possible explanations for group differences in the earthquake response. We know already that Mexican Americans and Blacks are socioeconomically

disadvantaged by comparison to White Anglos. Since socioeconomic level summarizes a wide range of significant life situational elements, controlling statistically for socioeconomic level can be an important step in separating subcultural from life situational determinants of earthquake response differences. In addition, demographic variables such as age and sex affect a wide range of human responses, and it is often necessary to partial out these effects in order to identify those that belong distinctively to the group subculture and life situation. When the most promising control variables have been identified, group differences in earthquake response will be re-examined after controls have been entered into an analysis of covariance. The result will tell which group differences persist and which differences disappear when the crucial variables are controlled.

CHAPTER THREE

LA OPINION: THE SPANISH-LANGUAGE NEWSPAPER

Ethnic groups in large metropolitan centers are usually serviced by foreign-language newspapers. The large Mexican-American and other Latin community in Los Angeles is serviced by the Spanish-language newspaper, La Opinion, and by Spanish-language radio stations and UHF television stations. La Opinion has been monitored on a daily basis for direct comparison with English-language newspapers as one clue to differences between the exposure of Spanish-speaking and English-speaking residents to earthquake news and issues.

According to information supplied by an editorial representative, the primary mission of La Opinion is to keep the Latin American community in the United States informed of local, national, and international events, with emphasis on reporting important events that take place in Latin American countries. The goal is to keep the cultural heritage of Latin Americans in the United States alive. In order to accomplish this mission, La Opinion stations several correspondents and reporters in various Latin American countries, such as Mexico, Columbia, and others. Aside from these special correspondents, news sources are primarily the United Press International and City News Services. La Opinion was founded in 1926 and its daily circulation averages 45,000. It is independently owned.

In the Basic Field Survey (February and March, 1977) we asked respondents, "Do you read any newspapers on a regular basis?" Of the 188 Mexican Americans and 46 other Latins in our sample, 62 percent and 61 percent respectively said they read a newspaper regularly. These percentages can be compared with 70 percent for the remainder of the survey sample.

TABLE 1

NEWSPAPERS READ BY MEXICAN AMERICANS AND OTHER LATINS

Newspaper	Number		Percent*	
	Read regularly	Also Read La Opinion	Read regularly	Also read La Opinion
Mexican Americans				
Los Angeles Times	50	4	27	2
Herald Examiner	40	2	21	1
Santa Monica Evening Outlook	0	-	0	-
San Gabriel Valley Tribune	6	0	3	0
Valley News & Green Sheet	2	0	1	0
Antelope Valley Press	0	-	0	-
Other community newspapers	23	3	12	2
Christian Science Monitor	0	-	0	-
Other national newspapers	2	1	1	1
Free Press	1	0	1	0
National Inquirer	4	0	2	0
LA OPINION	36	-	19	-
Pamphlets & magazines	3	0	2	0
Other	0	-	0	-
All Mexican Americans	188			
Other Latins				
Los Angeles Times	17	1	37	2
Herald Examiner	2	0	4	0
Santa Monica Evening Outlook	1	0	2	0
San Gabriel Valley Tribune	3	0	7	0
Valley News & Green Sheet	0	-	0	-
Antelope Valley Press	0	-	0	-
Other community newspapers	6	1	13	2
Christian Science Monitor	1	0	2	0
Other national newspapers	0	-	0	-
Free Press	0	-	0	-
National Inquirer	0	-	0	-
LA OPINION	7	-	15	-
Pamphlets & magazines	2	0	4	0
Other	1	0	2	0
All Other Latins	46			

*Percent of all Mexican Americans or all Other Latins, respectively.

The distribution of readership by newspapers is reported in Table 1. The number who read La Opinion is not great. Only 36 of the Mexican Americans and seven of the other Latins are regularly readers. Among both Mexican Americans and other Latins, more people read the Los Angeles Times than La Opinion. Relative to the sample as a whole, a larger proportion of Mexican Americans read the Herald Examiner, which comes in second to the Los Angeles Times and ahead of La Opinion. Thus, as we review the treatment of earthquake topics in La Opinion we must bear in mind that the majority of Mexican Americans and other Latins do not read La Opinion regularly. Like Anglos, the largest number of Latins depend on the Los Angeles Times. The Herald Examiner has a disproportionate appeal to Mexican Americans. Insofar as Mexican Americans exhibit different understandings and attitudes concerning earthquakes from other Angelenos, we may look for clues in the coverage by both La Opinion and the Herald Examiner.

A further clue to the significance of La Opinion can be found in the readership of La Opinion in combination with other newspapers. A relatively small number of people combine readership of La Opinion with readership of an English-language paper. Four Mexican Americans read both La Opinion and the Los Angeles Times, and two read both La Opinion and the Herald Examiner. Thus, the great majority of La Opinion readers do not read the standard English-language newspapers. There is a small but possibly significant segment of the Latin community who are dependent exclusively on La Opinion for newspaper sources of information.

Readership characteristics can be further clarified by taking note of the language usually spoken in the home. More than half of both Mexican Americans and other Latins usually speak Spanish in the home (Table 2).

TABLE 2

LANGUAGE USUALLY SPOKEN IN THE HOME
BY MEXICAN AMERICANS AND OTHER LATINS

Language	Number		Percent	
	Mexican Americans	Other Latins	Mexican Americans	Other Latins
English	73	19	38.8	41.3
English & Spanish	19	1	10.1	2.2
Spanish	96	26	51.1	56.5
Total	188	46	100.0	100.0

TABLE 3

NUMBER OF NEWSPAPERS READ REGULARLY
BY MEXICAN AMERICANS AND OTHER LATINS,
BY LANGUAGE USUALLY SPOKEN IN THE HOME

Number of newspapers read	Number				Percent		
	English	Both	Spanish	Total	English	Both	Spanish
			Mexican Americans				
None	17	8	47	72	23.3	42.1	49.0
One	32	6	37	75	43.8	31.6	38.5
Two	18	3	11	32	24.7	15.8	11.5
Three	5	2	1	8	6.8	10.5	1.0
Four	1	0	0	1	1.4	0	0
Total	73	19	96	188	100.0	100.0	100.0
			Other Latins				
None	5	0	13	18	26.3	0	50.0
One	9	1	8	18	47.4	100.0	30.8
Two	5	0	4	9	26.3	0	15.4
Three	0	0	1	1	0	0	3.8
Total	19	1	26	46	100.0	100.0	100.0

About twice as many of the predominantly Spanish speakers as of English speakers read no newspaper regularly (Table 3). Only twelve and one half percent of the predominantly Spanish-speaking Mexican Americans read two or more newspapers. About nineteen percent of the predominantly Spanish-speaking other Latins read two or more papers.

Readership of specific newspapers differs strikingly according to the language usually spoken in the home. At the risk of oversimplification we ask whether La Opinion attracts a substantial readership among English-speaking Latins because of its dedication to preserving a national and cultural heritage, or whether its appeal is limited to those who are more at home with the Spanish language. The latter is apparantly closer to the truth. Only four out of the 92 predominantly English-speaking Latins read La Opinion regularly (Table 4). On the other hand, more than two thirds of the predominantly Spanish-speaking Mexican Americans who read any newspaper regularly read La Opinion. Among predominantly Spanish-speaking other Latins the Los Angeles Times and La Opinion draw equal readership. Judging by readership patterns, we conclude that La Opinion does not serve importantly as a bridge back to national cultural origins for Latins who have become assimilated members of the inclusive southern California community. Rather it services primarily the unassimilated segment of the Latin community.

The evidence of exclusive readership for La Opinion can be further clarified in relation to language patterns. In the earlier review of general newspaper readership patterns we noted that La Opinion readers compared with readers of the other five newspapers monitored in this investigation, were the least likely to read any other newspaper regularly. Twenty-six of the 36 Mexican American readers read no other newspaper. Twenty-four of the 32

TABLE 4

NEWSPAPERS READ REGULARLY BY MEXICAN AMERICANS
AND OTHER LATINS, BY LANGUAGE USUALLY SPOKEN IN THE HOME

Newspaper	Number				Percent		
	English	Both	Spanish	Total	English	Both	Spanish
			Mexican Americans				
L.A. Times	32	4	14	50	43.8	21.1	14.6
Herald Examiner	25	8	7	40	34.2	42.1	7.3
S.M.E. Outlook	0	0	0	0	0	0	0
S.G.V. Tribune	5	1	0	6	6.8	5.3	0
Valley News & G.S.	1	1	0	2	1.4	5.3	0
La Opinion	3	1	32	36	4.1	5.3	33.3
All readers	(73)	(19)	(96)	(188)			
			Other Latins				
L.A. Times	11	0	6	17	57.9	0	23.1
Herald Examiner	0	0	2	2	0	0	7.7
S.M.E. Outlook	0	0	1	1	0	0	3.8
S.G.V. Tribune	0	0	0	0	0	0	0
Valley News & G.S.	0	0	0	0	5.3	0	0
La Opinion	1	0	6	7			23.1
All readers	(19)	(1)	(26)	(46)			

TABLE 5

EXCLUSIVE AND COMBINED READERSHIP OF LA OPINION,
FOR MEXICAN AMERICANS AND OTHER LATINS,
BY LANGUAGE USUALLY SPOKEN IN THE HOME

Other paper read?	Mexican Americans			Other Latins		
	English & Both	Spanish	Total	English & Both	Spanish	Total
No other paper read	2	24	26	1	4	5
Other paper read	2	8	10	0	2	2
All La Opinion readers	4	32	36	1	6	7
Percent who read no other paper	50	75	72	100	67	71

from homes where Spanish is the principal language read only La Opinion. Among the seven other Latin readers of La Opinion, five read no other paper. The language break-down for other Latins is hardly meaningful because of the small numbers. Altogether our sample of La Opinion readers contains eight persons who live in English-language or bilingual homes, of whom three do not identify themselves as Mexican Americans or Latins, and 38 who live in predominantly Spanish-language homes. Among these 38, 28 read no other newspaper regularly.

We can summarize the evidence briefly by saying that while La Opinion is not read regularly by the majority of Latins, it is the only newspaper read regularly by a substantial number of the predominantly Spanish-speaking Mexican Americans and other Latins in our sample. And, while the Los Angeles Times is the most frequently read newspaper for the Latin community as it is for other Angelenos, the Herald Examiner has a special appeal for Mexican Americans, and especially for those who live in homes where English is customarily spoken. If La Opinion is the newspaper distinctly attuned to the unassimilated Mexican American community, the Herald Examiner appeals in somewhat the same way to the more assimilated Mexican Americans.

General Coverage of Earthquake Topics

A summary of the total coverage of earthquake topics in La Opinion as compared with the English-language newspapers is found in Table 6. Although La Opinion gives some attention to earthquake topics during each of the eleven periods from January 2, 1976, to December 31, 1978, the number of items is low compared with the English-language newspapers during most of the periods. During six of the periods, La Opinion had fewer articles than any of the comparison papers. In two other periods only one comparison paper had

TABLE 6

TOTAL NEWSPAPER COVERAGE, BY NEWSPAPERS

AND PERIODS, WITH MEAN WEEKLY RATES

Newspaper	Period 1	2	3	4	5	6	7	8	9	10	11
	Number										
L.A. Times	10	59	79	119	82	94	74	76	102	62	98
Herald Examiner	16	72	49	71	45	42	31	27	44	56	30
S.M.E.O.	10	49	51	62	63	34	29	28	27	19	18
S.G.V.T.	9	49	52	54	76	79	53	37	43	39	44
Valley News	7	50	57	38	34	44	28	29	39	40	38
All English Language newspapers	52	279	288	344	300	293	215	197	255	216	228
La Opinion	5	95	39	46	18	23	15	32	21	34	36
All Newsprs.	57	374	327	390	318	316	230	229	276	250	264
	Mean Weekly Rates										
L.A. Times	2.12	5.64	6.29	7.19	7.48	6.30	3.82	5.44	5.4	3.75	5.55
Herald Examiner	3.62	6.45	3.35	4.73	4.41	2.97	1.76	2.03	2.18	3.38	1.45
S.M.E.O.	2.12	4.45	3.64	3.71	6.33	2.55	1.76	2.18	1.71	1.17	.95
S.G.V.T.	1.91	4.45	3.71	3.23	7.86	6.44	3.18	2.88	2.75	2.52	2.55
Valley News	1.49	4.54	4.07	2.28	3.55	3.11	1.65	2.26	2.38	2.95	2.30
All English Language newspapers	11.26	25.53	21.06	21.14	29.63	21.37	12.17	14.79	14.42	13.77	12.8
La Opinion	1.03	8.18	2.93	2.93	1.82	1.56	.89	2.33	.93	1.59	1.8
All papers	12.29	33.71	23.99	24.07	31.45	22.93	13.06	17.12	15.35	15.36	14.60

fewer items. But in marked contrast, the mean weekly rate of 8.18 articles from February 4 through April 20, 1976, is higher than the rate for any of the comparison papers, and nearly twice as high as rates for the Santa Monica Evening Outlook and the San Gabriel Valley Tribune. Of interest in light of the special appeal of the Herald Examiner to English-speaking Mexican Americans is the observation that the Examiner with a mean rate of ten articles per week is second to La Opinion during this period. As our further analysis will show, these high rates are explained by attention to the Guatemala earthquake of February 4. Again between September 9 and December 7, 1977, La Opinion coverage exceeds all but the Los Angeles Times. The earthquake in San Juan, Argentina, accounts for this strong showing.

The relative emphasis placed on the three broad topics of earthquake coverage is summarized in Tables 7 and 8. With only five articles in the pre-Guatemala-earthquake base-line period, percentages of coverage for La Opinion are not particularly meaningful. But in all of the remaining periods La Opinion consistently devoted a greater proportion of its coverage to earthquake events and smaller proportions of its coverage to prediction and to earthquake preparation and safety than any of the English-language newspapers. In this respect the Herald Examiner resembles La Opinion more closely than the Los Angeles Times does. The mean weekly rates indicate very little attention to predictions and earthquake preparation and safety in La Opinion throughout the study period. If we think of the reports on earthquake events as generally directing the reader's attention to remote areas of the world, and the topics of prediction and earthquake preparation and safety as usually directing the reader's attention near to home and to the immediately practical implications of earthquakes, the attention of La Opinion readers is disproptionately directed away from the practical and local problems of coping with earthquake hazard.

Coverage of each of these broad topics will be examined in detail.

TABLE 7

COMPARATIVE PERCENT DISTRIBUTION OF COVERAGE FOR
LA OPINION AND ENGLISH LANGUAGE NEWSPAPERS AND TOPIC AND PERIOD

Major topics	Los Angeles Times	Herald Examiner	Community papers	La Opinion
		Period I:	January 2-February 3, 1976	
Earthquake events	.50	.81	.85	.80
Predictions	.20	.06	.03	.20
Preparation and safety	.30	.19	.12	0
		Period II:	February 4-April 20, 1976	
Earthquake events	.73	.83	.77	.94
Predictions	.19	.08	.17	0
Preparation and safety	.14	.07	.11	.01
		Period III:	April 21-July 27, 1976	
Earthquake events	.44	.59	.60	.77
Predictions	.34	.20	.24	.18
Preparation and safety	.33	.16	.18	.10
		Period IV:	July 28-November 21, 1976	
Earthquake events	.54	.73	.73	.96
Predictions	.28	.25	.16	.09
Preparation and safety	.19	.13	.13	.02
		Period V:	November 22, 1976-February 2, 1977	
Earthquake events	.41	.44	.40	.77
Predictions	.26	.36	.20	.17
Preparation and safety	.28	.22	.39	.11
		Period VI:	February 3-May 12, 1977	
Earthquake events	.40	.45	.54	.96
Predictions	.15	.26	.19	0
Preparation and safety	.39	.29	.28	0

TABLE 7 (CONT'D)

		Period VII: May 13-September 8, 1977		
Earthquake events	.42	.55	.58	.73
Predictions	.09	.19	.11	.20
Preparation and safety	.37	.23	.25	.07
		Period VIII: September 9-December 7,1977		
Earthquake events	.36	.74	.49	.78
Predictions	.19	.04	.10	.06
Preparation and safety	.47	.19	.36	.09
		Period IX: December 8, 1977-April 21, 1978		
Earthquake events	.35	.68	.49	.62
Predictions	.16	.11	.12	.19
Preparation and safety	.51	.16	.45	.05
		Period X: April 22-August 13, 1978		
Earthquake events	.45	.77	.56	.68
Predictions	.19	.14	.08	.06
Preparation and safety	.34	.07	.29	.03
		Period XI: August 14-December 31, 1978		
Earthquake events	.58	.63	.75	.81
Predictions	.19	.13	.10	.14
Preparation and safety	.36	.20	.22	.06

TABLE 8

COMPARATIVE MEAN WEEKLY RATES OF COVERAGE
FOR LA OPINION AND ENGLISH-LANGUAGE NEWSPAPERS
BY MAJOR TOPICS AND PERIODS*

Major topics	Los Angeles Times	Herald Examiner	Community papers	La Opinion
		Period I: January 2-February 3, 1976		
Earthquake events	1.06	2.77	1.56	.85
Predictions	.43	.21	.07	.21
Preparation and safety	.64	.64	.21	0
		Period II: February 4-April 20, 1976		
Earthquake events	3.91	5.45	3.45	8.09
Predictions	1.0	.55	.76	0
Preparation and safety	.73	.45	.48	.09
		Period III: April 21-July 27, 1976		
Earthquake events	2.5	2.07	2.26	2.14
Predictions	1.93	.71	.90	.5
Preparation and safety	1.86	.57	.71	.29
		Period IV: July 28-November 21, 1976		
Earthquake events	3.83	3.11	2.24	2.63
Predictions	1.98	1.08	.50	.24
Preparation and safety	1.38	.54	.40	.06
		Period V: November 22, 1976-February 2, 197		
Earthquake events	3.26	1.92	2.27	1.34
Predictions	2.01	1.53	1.09	.29
Preparation and safety	2.21	.96	2.17	.19
		Period VI: February 3-May 12, 1977		
Earthquake events	2.69	1.34	1.89	1.56
Predictions	.99	.78	.73	0
Preparation and safety	2.62	.85	1.13	0

TABLE 8 CONTINUED

		Period VII:	May 13-September 8, 1977	
Earthquake events	1.82	1.0	1.18	.65
Predictions	.41	.35	.22	.18
Preparation and safety	1.59	.41	.57	.06
		Period VIII:	September 9-December 7, 1977	
Earthquake events	2.10	1.56	1.17	1.94
Predictions	.54	.08	.23	.16
Preparation and safety	2.80	.39	.88	.23
		Period IX:	December 8, 1977-April 21, 1978	
Earthquake events	1.87	1.56	.92	.67
Predictions	.83	.26	.21	.21
Preparation and safety	2.70	.36	.86	.05
		Period X:	April 22-August 13, 1978	
Earthquake events	1.72	2.64	1.04	1.41
Predictions	.74	.49	.20	.12
Preparation and safety	1.29	.25	.61	.06
		Period XI:	August 14-December 31,1978	
Earthquake events	2.85	.95	1.2	1.45
Predictions	.95	.20	.18	.25
Preparation and safety	1.75	.30	.42	.10

Earthquake Events

The number of items dealing with earthquake events in each of the eleven periods is abstracted for convenience into a single table as the basis for the following account. In addition, in Table 9, these frequencies have been converted into mean weekly rates so as to erase the confusing effect of unequal-length periods in identifying changes. Since the prominence accorded a news item is often more important than the mere fact of coverage, we offer a companion Table 10 which includes only front-page items.

During the base-line period the earthquakes reported in local newspapers were not especially newsworthy. La Opinion reported only four of them, less than the other papers, but featured them all on front pages. In total coverage and front-page emphasis, La Opinion was more like the Los Angeles Times than like the other papers during this period.

Period II, from February 4 through April 20, witnessed the sharp rise in attention to earthquake events, especially in La Opinion. All of the papers featured earthquake events on front pages several times, but La Opinion averaged a front-page story two out of every three days during this period. The Herald Examiner followed La Opinion in both total and front-page coverage, with a front-page story on the average about every third day. Because the rates during this period are principally a reflection of the interest in the Guatemala earthquake, we shall review coverage of that quake in depth after a brief examination of event coverage in the remaining periods.

The period fron April 21 through July 27 (Period III) witnessed a return to more moderate rates of attention to earthquakes. Rates for the various newspapers are surprisingly uniform, with La Opinion having only a slightly higher mean weekly rate than the others. However, La Opinion differed strikingly from the other papers in the rate of front-page placement of earthquake

TABLE 9

NEWSPAPER COVERAGE FOR EARTHQUAKE EVENTS:

JANUARY 2, 1976 TO DECEMBER 31, 1978

Time Period	L.A. Times	Herald Examiner	Community papers*	La Opinion
		Frequency		
Period 1	5	13	7.33	4
Period 2	43	60	38	89
Period 3	35	29	31.66	30
Period 4	54	52	37.33	44
Period 5	34	20	23.66	14
Period 6	38	19	26.66	22
Period 7	31	17	20	11
Period 8	27	20	15	25
Period 9	36	30	17.66	13
Period 10	28	43	17	23
Period 11	57	19	24	29
Totals	398	322	258.3	304
		Mean Weekly Rates		
Period 1	1.06	2.77	1.56	.85
Period 2	3.91	5.45	3.45	8.09
Period 3	2.5	2.07	2.26	2.14
Period 4	3.83	3.11	2.24	2.63
Period 5	3.26	1.92	2.27	1.34
Period 6	2.69	1.34	1.89	1.56
Period 7	1.82	1.0	1.18	.65
Period 8	2.10	1.56	1.17	1.94
Period 9	1.87	1.56	.92	.67
Period 10	1.72	2.64	1.04	1.41
Period 11	2.85	.95	1.2	1.45
Totals	2.51	2.22	1.74	2.07

*Figures for community newspapers are means for the three papers. For example, the three newspapers had an average of 7.33 items during Period 1, and the average means weekly rate was 1.74.

TABLE 10

FRONT PAGE COVERAGE OF EARTHQUAKE

EVENTS: JANUARY 2, 1976 - DECEMBER 31, 1978

Time period	L.A. Times	Herald Examiner	Community paper*	La Opinion
Period 1	3	1	2	4
Period 2	10	16	7.33	34
Period 3	6	7	4.67	21
Period 4	2	11	2.67	21
Period 5	8	9	6.33	8
Period 6	1	2	4	16
Period 7	1	4	4	4
Period 8	1	3	3	6
Period 9	0	1	4.33	6
Period 10	0	4	4	9
Period 11	6	1	6.33	10
Totals	38	58	48.66	139
	Mean Weekly Rates			
Period 1	.62	.21	.41	.82
Period 2	1.43	2.29	1.05	4.86
Period 3	.43	.50	.33	1.50
Period 4	.12	.66	.16	1.26
Period 5	.77	.86	.61	.77
Period 6	.07	.14	.28	1.13
Period 7	.06	.24	.24	.24
Period 8	.08	.16	.23	.47
Period 9	0	.05	.22	.31
Period 10	0	.25	.25	.55
Period 11	.30	.05	.32	.50
Totals	.35	.49	.37	1.13

stories. La Opinion had three times as many front-page items as the Herald Examiner, the "runner up" in this respect. Thus the editors of La Opinion may have found little more news of earthquakes around the world to report to their readers, but they gave greater prominence to the events they reported. As in Period II, much of the coverage of events went to a single devastating earthquake, this time in Northern Italy. Again we shall examine treatment of this earthquake in some depth.

The fourth period begins with the great Chinese earthquake that struck Tangshan and Tientsin on July 28, 1976, though news of this quake was quite limited and leaked out of the People's Republic quite slowly. There was a slight rise in the mean weekly rates for all newspapers, though the increase was trivial for La Opinion. Mean weekly rates for both the Los Angeles Times and the Herald Examiner now exceeded the rate for La Opinion. But the rate of front-page coverage dropped sharply for the Times and community newspapers, and dropped less sharply for La Opinion. Only the Examiner increased front-page coverage in this period. La Opinion continued to stand out for much the highest rate of front-page attention to earthquake events. We have looked separately at the reporting of the Chinese earthquake.

Period V, from November 22, 1976 to February 2, 1977, again featured one devastating earthquake. On November 24, an earthquake registering 7.6 on the Richter scale struck in Turkey, killing about 3,000 people and injuring many others. About eighty villages were destroyed, leaving 20,000 people homeless. Substantial aftershocks were reported on December 1, March 24, May 12, and May 26, running into Periods VI and VII.

In spite of this earthquake, average weekly coverage throughout the period declined for all but community newspapers, especially for La Opinion and the Herald Examiner. Now for the first time since the Guatemalan earthquake,

La Opinion had substantially less coverage of earthquake events than the English-language newspapers. However, the rate of front-page attention remained on a par with other papers, though the Herald Examiner was highest in this respect.

Period Six, from February 3 to May 12, 1977, witnessed declining coverage of earthquake events in all English-language newspapers, in spite of another disastrous quake. On March 4 and in subsequent aftershocks about 1500 people were killed and 2500 others injured in and around Bucharest, Rumania. But La Opinion reversed the trend of English-language newspapers, showing a small increase in weekly coverage from the preceding period. La Opinion is strikingly different from all other papers in giving front-page prominence to nearly all stories during this period. Readers who perused only the front pages would have encountered sixteen stories about the Rumanian earthquake in La Opinion compared to only one in the Times, and two in the Examiner, and four in the average community paper.

Coverage of earthquake events reached the lowest level since the baseline period between May 13 and September 8, with La Opinion rates dropping most of all. Period VII provides the longest interval since the beginning of the study period without a disastrous earthquake of general interest to American readers. In spite of this moratorium, La Opinion, the Herald Examiner, and the community newspapers each found four occasions to feature earthquakes on front pages. Again, while general coverage of earthquake during this period was much less extensive in La Opinion than in the English-language newspapers, front-page coverage was just as extensive.

Period VIII, from September 9 to December 7, 1977, reveals another unparallelled upswing in La Opinion coverage. While community newspaper rates were unchanged from the previous period, Times rates increased slightly and Examiner rates went up by fifty percent, La Opinion rates trebled. Six items

appeared on the front pages of La Opinion, compared with one for the Times and three each for the Examiner and the community papers. The occasion for exceptional attention by La Opinion was another Latin American quake. San Juan, Argentina, was the nominal site of an earthquake on November 23 that was also felt in Brazil, Uruguay, and Chile. Although the 50 dead and 223 injured did not rival the casualties in other recent quakes, the quake had special significance to the Latin community.

Period IX, from December 8, 1977 to April 21, 1978, again exhibited declining attention to earthquake events, except in the Herald Examiner. The drop for La Opinion was as dramatic as the increase had been during the previous period. Again though, La Opinion continued to feature more front-page accounts of earthquakes than the other papers.

While the Times and community newspaper coverage rates changed little between Period IX and Period X, Herald Examiner coverage increased substantially and La Opinion coverage more than doubled. An earthquake in Salonika, Greece, accounts for this increased attention by the newspapers most attuned to the Latin community between April 22 and August 13, 1978.

During the four and a half months from August 14 to December 31, 1978, Times coverage rose sharply while La Opinion coverage remained steady and, surprisingly, Examiner coverage dropped sharply. It was during this period, on August 14, that a moderately destructive quake occurred in neighboring Santa Barbara, causing much local discussion and concern. But the one front-page story and two others given to this quake by La Opinion was less than the three front-page and two other stories devoted to the more remote but also more disastrous in Tabas, Iran, on September 14. Surprisingly brief attention was given the November 30 earthquake in Mexico, perhaps because limited casualties provided insufficient occasion for altruistic outpourings of aid to demonstrate Latin solidarity.

Summarizing the full three-year study period, certain characteristics of La Opinion coverage can be reported. First, the more extensive coverage by

the Los Angeles Times is only equalled and exceeded during the period of the Guatemala earthquake. Nevertheless, La Opinion readers may still have received a more vivid impression of destructive earthquakes around the world because of the consistent pattern of front-page prominence given to earthquake accounts. In ten of the eleven periods La Opinion featured more front-page stories about earthquake events than the Los Angeles Times, and in nine periods there were more front-page stories in La Opinion than in any of the English-language papers monitored. Second, since there is less routine coverage of earthquakes in La Opinion than in the Times and other English-language papers, rates of coverage are more volatile. Readers are more likely to gain the impression that periods of quiet are broken suddenly by devastating quakes, and less the impression that quakes are occurring somewhere nearly all of the time. Third, the greatest interest is focused on earthquakes in Latin America, with considerable attention to quakes in the more broadly "Latin" countries along the European shores of the Mediterranean Sea. In contrast, the nearby Santa Barbara earthquake that served to remind many Angelenos of their own earthquake risk, received only perfunctory attention in La Opinion. Fourth, on several instances Herald Examiner patterns paralleled those of La Opinion, suggesting that the distinctive treatment of earthquake events is conveyed to the English-speaking as well as the Spanish-speaking Mexican American population.

In the remainder of this section the following earthquake events will be discussed: The Guatemalan quake of February 4, 1976; the Italian earthquake of May 6, 1976; the Chinese earthquake of July 28, 1976; the Rumanian earthquake of March 5, 1977; and San Juan, Argentina, earthquake of November 23, 1977; the May-June, 1978 earthquake in Salonica, Greece; the Santa Barbara quake of August 14, 1978; the September 17, 1978 earthquake at Tabas Iran; and the November 30, 1978, earthquake in the Oaxaca region of Mexico. These earthquake were selected for discussion because of the significance of the events in the affected areas and the amount of media coverage they received in the monitored newspapers.

The Guatemalan earthquake - February 4, 1976. Table 11 provides a numerical account of newspaper coverage of the quake by all the newspapers for the period between February 4 and March 4. As these figures indicate, no other newspaper featured the Guatemalan quake to the same extent as La Opinion. The Herald Examiner, with the second greatest coverage, had about half (44) as many articles as La Opinion (83). The same difference was found with respect to front-page coverage. The Examiner had 14 and La Opinion 27 front-page articles. The greatest number of articles during any single day in La Opinion was 16 (February 7, 1976), giving some idea of the intensity of attention to this earthquake in a Latin nation.

The reporting of the Guatemalan earthquake in La Opinion was found to be different from that of the non-Spanish newspapers in several ways. First, a theme of ethnic solidarity was the main thrust of at least five items that attempted to show how other nations--especially Latin American countries--banded together to help each other. No such emphasis was apparent in the non-Spanish newspapers. Among the items that advanced the theme of solidarity, two were letters to the editor of La Opinion. One of these consisted of comments by a Mexican resident in Los Angeles about the Guatemalan tragedy. The writer stated:

> It is sad to see the T.V. reports regarding the consequences of the earthquake. It is a tragedy that has come as a shock to the whole world . . .. But at the same time it is comforting to see the solidarity of our neighboring nations who have responded immediately to help those brothers who are in desperate need (LO, February 9, 1976).

The same feelings were manifested by La Opinion in an editorial in which it was stated that despite the intensity of the earthquake and the overall devastation, Guatemala was not left alone to carry this natural disaster. "Fortunately, the sense of 'human solidarity' still prevails; and this solidarity is again being manifested in the prompt response to the call for help that is taking place. . ." (LO, February 7, 1976). The Guatemalan Consul in Los Angeles,

TABLE 11

NEWSPAPER COVERAGE OF FOUR EARTHQUAKES

FOR ONE MONTH PERIODS

Nature of coverage	Metropolitan papers		Community papers			La Opinion
	L.A. Times	Herald Exam.	SMEO	SGVT	VN	
Guatamala Earthquake: Coverage Feb. 4 - March 4, 1976						
Front page	9	14	9	5	5	27
Total	31	44	23	20	25	83
Italy Earthquake: Coverage from May 6 - June 6, 1976						
Front page	2	5	4	6	0	9
Total	6	10	12	14	10	12
China Earthquake: Coverage fron July 28 - August 28, 1976						
Front page	7	3	6	1	1	10
Total	24	13	11	12	4	12
Santa Barbara: Coverage from August 14 - Sept. 14, 1978						
Front page	3	1	3	1	1	1
Total	12	3	3	8	7	3

Dario Soto Montenegro. also shared similar opinions in another letter to the editor of La Opinion. The Consul felt that "once again Latin Americans heard and were responding to the call for help quite effectively--more evidence for mutual support and solidarity among Latin Americans." In this letter, Soto Montenegro made special mention of the cooperative efforts by the other Central American consuls in Los Angeles in trying to collect and encouraging people to donate supplies (LO, February 7, 1976). Another report from La Opinion quoted the Puerto Rican Cardinal, Luis Aponte Martiniz, as stating at a Sunday mass that "people should be united in order to help in any possible way and show a sense of solidarity and brotherhood to the Guatemalan people" (LO, February 7, 1976). As it appears from the above articles, this theme of solidarity surfaced in most of the articles in La Opinion on February 7, 1976. Similar mention was made rather sporadically in subsequent reports.

A second difference found in most of the reporting from the Spanish newspaper was the more intense dramatization of the event that prevailed. Widespread chaos was a dominant theme in some of the stories. The intensity of panic, fear, and chaos appeared to have been magnified in the reporting as days passed and aftershocks followed. On February 5, 1976, it was reported that panic prevailed after the first major shock. There was also fear of subsequent quakes according to these reports. On February 7 the reports emphasized greater panic and chaos. Some of the reactions from the residents were reported: many fearful women fainted while others cried hysterically on the streets. Owners of the few remaining standing stores reportedly closed their doors to prevent strangers from running in. Others prayed aloud, stricken by fear. On February 8 it was reported that immense panic and terror prevailed. Many women were hysterical on the streets. To the fear of more aftershocks the fear of epidemics and vandalism was now added. On February 19 and 20 the stories read:"People live in a state of terror since the earth movements

seem to have no end. Due to the fear of more shocks millions of people continue to sleep outdoors." Whether it describes the actual behavior of Guatemalans in response to disaster or merely a Latin view of how people would respond, this dramatized picture accords well with stereotypes of the emotionally expressive Latin people.

Added to this dramatic tone found in La Opinion was a religious theme. Several articles revealed the tendency of certain people to connect a natural geological phenomenon to an act of God. Such connection was found in at least two articles stating that the Catholic Church had issued a warning that earthquakes are "acts of God" and that people should therefore begin repenting for their sins (February 9, 1976). Not only was fear for the possibility of more aftershocks reported, but also the fear of God. Other articles reported various religious activities that were taking place throughout Guatemala subsequent to the earthquake of February 4. Some of these were reportedly in the form of processions, masses, praying sessions, and funerals. Also mentioned in at least one article (February 4, 1976) was the cultural Mayan tradition of carrying out these religious events. The articles not only mentioned what was taking place throughout Guatemala but certain customs and cultural traditions were also brought to the attention of the readers.

The religious and philosophical approach found in some of the articles of La Opinion was not only reported to have been manifested by survivors of the quake but also by other people outside of Guatemala. In a letter to the editor of La Opinion one person expressed his feelings about the earthquake as an occasion for thinking about the reality of modern society. He stated:

> The Guatemalan disaster makes us think about the reality of our modern society: it dies suffocated by its selfishness, burying its heart and lifting the fist in sign of protest because it hasn't really stopped to analyze the current problems that face modern man, that shake existence and sometimes seem to destroy it among the debris of terror and desolation" (February 21, 1976).

In another letter to the editor of La Opinion on February 22, 1976, a resident of Los Angeles felt that the United States should give an example of generosity and teach the world nobility by issuing an order to the Department of Immigration that all people born in Guatemala but living illegally in this country should be allowed to obtain a temporary permit to stay here rather than being deported back to Guatemala. In the opinion of this man all these illegal aliens are worthy of respect and admiration for they have left their families in the search for a better future. They are a replica of those European pioneers who also came to this country, running away from misery in search for a future. Such an opinion was never expressed in any of the letters to the editor or any other articles in the non-Spanish newspapers. Also, as mentioned before, neither the religious nor the ethnic themes were found in articles in these newspapers. A quantitative difference was found in the number of articles dealing with the response to the call for aid by various countries and organizations in La Opinion as compared with other papers. This newspaper featured at least forty articles that pertained mainly to this subject whereas all the five non-Spanish newspapers combined featured many fewer than that number during the month of February. There were some articles in La Opinion that discussed several activities that were organized in the United States to collect donations which would be sent to Guatemala. One article (February 14, 1976) announced a "radio marathon" to be conducted by K-LOVE, a radio station in Los Angeles. The aim was to encourage radio listeners to cooperate with aid efforts for the Guatemalan tragedy. A similar article on February 17, 1976 reported on a series of campaigns to collect

donations which were undertaken by radio stations, such as KWKW, K-LOVE, KMEX, KWHY, KEGM, and by television stations such as channels 34 and 22. La Opinion also printed an article on February 18, 1976, which reported on a chain of Spanish television statios in New York which conducted "telethons" similar to those in Los Angeles to collect donations to be sent to Guatemala.

No other important differences were noted in the treatment of the Guatemalan event between the English-language and the Spanish-language newspapers.

The Italian earthquake--May 6, 1976. Newspaper coverage of the northern Italy earthquake is also summarized in Table 11. Coverage was generally much less than for the Guatemala quake, in all newspapers. Coverage in the metropolitan dailies was from a fourth to a fifth as frequent as for the Guatemala disaster. The amount of coverage in La Opinion is similar to that in most English-language newspapers, though more of it is found on the front pages.

Two general questions guided our examination of the treatment of the north Italy earthquake in La Opinion. First, are the distinctive patterns observed for the Guatemala quake characteristic of all earthquake reporting, or do they reflect only the special meaning for Latins of disaster in another Latin community? And second, are Italians viewed as fellow Latins, leading to expression of ethnic solidarity feelings similar to those so prevalent in news of the Guatemala earthquake? In amount of coverage it is clear that disaster in north Italy is much less newsworthy than disaster in a Latin American nation. There are about a seventh as many items dealing with the north Italy quake as with Guatemala. However, the interest indicated by front-page placement remains high.

A careful reading of items in La Opinion failed to reveal the theme of ethnic solidarity. Not only was there no expression of any particular bond to the dispossessed and injured north Italians, but there was no special attention

to their need for outside help. The Santa Monica Evening Outlook quoted Senator Edward Kennedy as saying that the government "must come to Italy's aid on humanitarian grounds" (SMEO, May 8, 1976). And the San Gabriel Valley Tribune discussed a petition from President Ford to Congress for 25 million dollars in disaster relief funds to help earthquake survivors in Italy "rebuild their lives and to help the Italian nation recover from this tragedy" (SGVT, May 11, 1976). But La Opinion did not feature this theme.

The high degree of dramatization that characterized reporting of the Guatemala earthquake was also singularly missing from articles dealing with the north Italy quake. All the newspapers reported that panic was the initial reaction of the people in the affected areas, but La Opinion was not strikingly different from the other newspapers in this respect. For example, on May 7, an article in La Opinion stated that panic was experienced in Venice where "thousands of people ran out of their homes in great panic and crowded themselves in the parks and piazzas." On May 20 this paper reported on a series of aftershocks that had struck northern Italy the day before. According to the article "this quake did not cause alarm among the residents, most of whom were staying in makeshift tents." The San Gabriel Valley Tribune reported on May 8 that panic had prevailed after the first shock and that "tens of thousands, fearing more tremors, spent the night in tents, in their cars, and under makeshift shelters in the open" (SGVT, May 8, 1976). In a very similar manner, the Santa Monica Evening Outlook featured a front-page article on May 7 stating that "thousands of frightened survivors rushed out of their towns and villages after the quake to sleep outdoors..."

The distinct religious theme that was prevalent in La Opinion coverage of the Guatemalan quake was also entirely missing from the accounts of the north Italy quake. Our search for a religious theme in La Opinion uncovered only a report that "survivors in the area near the frontier of Austria and

Yugoslavia began to bury the dead in large mass graves without any religious ceremonies" (LO, May 10, 1976). The English-language newspapers did not discuss the religious aspect in any of their stories dealing with this earthquake.

In summary, treatment of the north Italy earthquake in La Opinion was not noticeably different from treatment in the English-language papers in either quantity or content, except for the frequency with which the earthquake received front-page attention. The sense of nationalistic bonding, the heightened emotionality of treatment, and the search for deep religious meanings were evoked by disaster in a Latin American nation but not by disaster in a non-Spanish Latin nation in another hemisphere. The Guatemalan quake was clearly an event with intense nationalistic and personal meanings in the Mexican American community, and the pattern of reporting is not characteristic of other earthquake disasters.

The China earthquake--July 28, 1976. La Opinion gave just about the same amount of attention to the great earthquake in the People's Republic of China as it did to the north Italy quake. Again, most of the articles in La Opinion were front-page stories. Except for much more frequent front-page placement, La Opinion coverage was quite similar in amount to that in the Herald Examiner, Santa Monica Evening Outlook, and San Gabriel Valley Tribune. The Valley News gave surprisingly little attention to the China quake. In contrast, the Los Angeles Times gave much more attention to the China quake than La Opinion and the other newspapers, and much more than it gave to the north Italy quake.

As with the north Italy quake, the three distinctive themes from the Guatemala quake were not found in La Opinion treatment of the Chinese earthquake. There were references to the internal solidarity of the Chinese people, based on the official reports issued by the Chinese government. A few articles

mentioned the solidarity of the Chinese people in helping their "brothers," which the metropolitan papers saw as a reflection of the Chinese government's policy of self-reliance. One article in La Opinion discussed the lack of information from Chinese authorities concerning the extent of damage from the quake. It also called attention to a report in the Chinese newspaper stating that a few members of rescue teams had died as a result of their "patriotic efforts" to help their class brothers (LO, August 3, 1976). But there was no theme of international, ethnic, or third-world solidarity.

All newspapers had much less to say about the people's reactions after the Chinese earthquake than they had for the Guatemala or Italy quakes. This was undoubtedly a consequence of the absence of American reporters on the scene and the reluctance of the Chinese authorities to release information on the severity of the quake. La Opinion exhibited no greater tendency to dramatize the events than the English-language newspapers. One article in La Opinion reported that "Radio Peking and T.V. stations reportedly continued their daily programs without mentioning the earthquake at all" (LO, July 31, 1976).

There was no mention of religious activities or implications of the Chinese quake in La Opinion or any of the other newspapers. There were no letters to the editor concerning this quake in La Opinion.

Thus the review of coverage for the China quake in La Opinion shows little that is distinctive. Readers of La Opinion would have read just about as much about the north Italy and China quakes as would readers of most English-language newspapers, and would have been exposed to no slant or bias. Special emphasis and distinctive interpretation of events were reserved for the disaster that befell a neighboring Spanish-speaking nation.

Bucharest, Rumania. On March 5, 1977, a major earthquake took place in Bucharest, Rumania. La Opinion published a UPI press release stating that Eastern Europe experienced an intense and highly destructive earthquake, which also caused a series of minor tremors and aftershocks covering an extensive geographical region from Rome, Italy to Moscow, Russia. Material and human damages were very heavy. The magnitude was estimated as from 7 to 7.5 degrees on the Richter scale. The time given was during supper time, which was said to have increased the human casualites. The initial reports gave 20 persons dead and 165 injured within the Bulgarian territory in the Balkan area.

By the time of the final reports on March 10, the totals were increased to 1300 persons dead, 10,000 injured, and over one billion dollars in property damage. The total coverage recieved in La Opinion was six articles, all on the front page. Except for the prominence given to it by front-page placement, the La Opinion account was the standard news service version, similar to that in the English-language papers.

San Juan, Argentina. San Juan, Argentina, experienced a destructive earthquake on November 23, 1977. According to the initial coverage in La Opinion, casualties tolled 50 dead persons and 223 injured in San Juanina de Causete, and 80 percent of the city was destroyed. The magnitude was registered as 7 degrees on the Richter scale. Its effects were reported to have been felt 1200 kilometers away in Buenos Aires. People were reported to have been running panic-sticken in Santiago, Chile. Porto Alegre, Brazil reported several windows damaged and Montevideo, Uruguay reported that it was the most powerful earthquake felt in this country during the last 50 years and that it caused alarm within the population of several cities. Also, the seismic station in Uppsala, Sweden registered this earthquake's magnitude as 8.2 degrees on the Richter scale, and Golden, Colorado, reported it as 7.4 degrees on the same

scale.

La Opinion coverage was sensationalized but credited to United Press International releases. People were said to have been running about, panic-stricken in at least three cities in three different countries, namely, Santiago, Chile; Porto Alegre, Brazil, and San Juan, Argentina. La Opinion covered this earthquake event with four front page articles out of 8 articles as the total coverage. The quake was called so powerful that it caused 200 aftershocks, 140 of them in only 2 days.

Salonica, Greece. During a month-long period, from May 25 to June 25, 1978, Salonica, a northeastern city in Greece, experienced a series of earthquakes with magnitudes ranging from 5 to 6.5 degrees on the Richter scale, and with devastating effects and a multiplicity of aftershocks. The whole experience was so critical that after several tremors the exodus of the population reached three fourths of the 720,000 total population of Salonica, according to La Opinion. This was depicted as a rare event to force the massive exodus of the population and to drive the remaining inhabitants to live in parks and any open and secure space available. Because of the massive exodus the human casualites were held to 49 persons dead, including 37 who died inside an apartment building, and 120 injured. The last reported earthquake of this series in Salonica took place on July 5. One old man, who died of a heart attack and 16 wounded persons were reported as human casualties. A police officer gave credit to the exodus of the population in keeping the number of casualties low.

Santa Barbara, California. Locally, the only earthquake with a magnitude as great as 5.5 degrees on the Richter scale was experienced in Santa Barbara on August 14, 1978. Property damage was close to five million dollars, according to the UPI press release in La Opinion. On August 15, La Opinion in the article with a UPI credit said: "when the earthquake shook the central coastal area, thousands of panic-stricken persons rushed into the streets, the report says."

Several persons fell down and were treated for minor injuries, but human casualties were minimal. The total coverage in La Opinion consisted of one front page out of three articles. The Spanish-language newspaper relied entirely on syndicated news, despite the proxmity of the quake. The implied message seems to have been that the earthquake in Santa Barbara was not very interesting to Latin readers.

Tabas, Iran. The headline on La Opinion's front page on Sept, 17, 1978, was "Few Victims Caused by the Biggest Earthquake of the Year." The headline was correct according to the initial report, but the next day's information was shockingly different. The next headline read, "More than 11,000 Persons Died in the Earthquake." This casuality figure only applied to Tabas, Iran. In the text of the articles there was a reference to September, 1968, when another earthquake caused 20,000 victims in the same region. People were reported to be running about in states of panic. All the local physicians were said to have died under the walls and roofs of their adobe houses. The coverage consisted of five articles, three of which were on the front page. In addition there was photo-reportage giving the approximate number of victims as 25,000 dead persons. The final report gave a magnitude of 7.7 on the Richter scale and 15,000 as the total number of victims.

Mexico. On November 30 and December 1 and 3 La Opinion carried reports of a magnitude 7.9 earthquake and two days of aftershocks, in southern Mexico. Nine deaths were reported in Mexico City and Oaxaca. The first two reports included dramatic front-page pictures of earthquake damage, and the third discussed the surprisingly accurate prediction of the quake by University of Texas scientists. While stressing the seriousness of the quake and the resulting panic, reports compared it with the 1957 Mexico City quake that killed 57 and the Veracruz quake of 1973 that killed 527. Since La Opinion relied exclusively on UPI reports, adding no commentary of its own, none of the themes that marked the Guatemalan coverage was observed.

Among these events it is only the Guatemala earthquake whose reporting is distinctively different from that in the English-language papers. There may be some tendency to report all the events in more sensationalized terms and to depict panic as more prevalent, persistant, and vividly acted out, but only because this is the style of the UPI reports used. On the other hand, relatively little interest was displayed in the nearby Santa Barbara, California, earthquake and interest was not sustained in the Mexico earthquake, perhaps because of the small number of casualties.

Earthquake Prediction

For the entire three year period that was monitored, La Opinion published only thirty one items that we classified as dealing with earthquake prediction. There was a single article in the base line period and none during the Guatemala earthquake-Palmdale bulge period. Coverage peaked at an average of one item every two weeks during the interval from announcement of Whitcomb's "prediction" to the great Tangshan (China) earthquake of July 28. Thereafter the rate dropped back to from one item every four weeks to one every six weeks. Plainly earthquake prediction was underemphasized by La Opinion, as compared with the English-language newspapers.

The distribution of coverage in La Opinion by periods and specific topics is presented in Table 12. Twenty-six of the thirty-one articles dealt with prediction techniques and research. The first such article appeared on the inside pages on January 4, 1976. The article reported a meeting on earthquake prediction, recently held in San Francisco (the date of the meeting was not given). It was reported that seismologists around the world were continuing to work intensively on the theory of plate techtonics and on the discovery and assessment of prediction techniques such as the use of tiltmeters and observing animal behavior. Other topics discussed were the effects an accurate prediction would have on people, the impact on property values and insurance,

TABLE 12

LA OPINION COVERAGE OF EARTHQUAKE PREDICTION

Specific topic	Periods 1	2	3	4	5	6	7	8	9	10	11
General predictions	1	0	3	4	2	0	3	2	4	2	5
Palmdale Uplift	--	0	0	0	3	0	0	0	0	0	0
Whitcomb	--	--	4	0	0	0	0	0	0	0	0
Minturn	--	--	--	--	0	0	0	0	0	0	0
All articles	1	0	7	4	3	0	3	2	4	2	5

and related topics. The article stated that "the goal of accurate prediction is just around the corner--within a decade or so." An article on July 10, 1976, discussed another potential prediction technique that was being studied by scientists at the University of California at Berkeley and at the National Center for Earthquake Investigation (USGS) in Menlo Park. Reportedly measurements of a radioactive gas called radon, found in very small amounts in well water, might be an aid in predicting earthquakes. Such measurements have been used for predicting earthquakes with some success in China and the Soviet Union. These two articles are typical of prediction coverage.

The potential socioeconomic consequences of earthquake prediction were the topic of a single article. On July 21, 1977, La Opinion reported on the research and findings of the sociologists, Haas and Mileti, indicating that an earthquake prediction might be costly to the community in creating an economic recession.

On July 7, 1978, La Opinion carried the report that, "Jim Berkland, a geologist from Santa Clara County, has predicted that the San Francisco Bay region could experience a mild earthquake within ten days." The predicted magnitude was given as 3.5 to 5.0. Berkland's predictions are linked to ebb tides and are based on stress from the gravitational effect of the sun and moon. He contends that his predictions have been fifty percent accurate in the past. Nevertheless his system has been criticized by scientists who specialize in the study of earthquakes.

An article on October 26, 1978, reported on a symposium held in Lima, Peru, dealing with prospects for predicting earthquakes in the future.

On November 19, 1978, the Sunday supplement featured an extensive article on the Twelfth Symposium on Mathematical Geophysics, held in Caracas, Venezuela. Included was a discussion of research dealing with earthquake prediction by Hiroo Kanamori, a scientist associated with the California Institute of Technology in Pasadena, California. Kanamori was reported as unwilling to give definite answers to questions about the validity of earthquake predictions.

The December 3, 1978, issue of La Opinion featured an article about the successful prediction of an earthquake in Mexico City, more than a year in advance. The prediction was issued by scientists associated with the University of Texas, and published in the journal of Pure and Applied Geophysics. According to the report in La Opinion, the precise magnitude, location, date, and time of day were correctly predicted. This prediction was reported in other papers, and was indeed an important accomplishment. However the claims of great precision in La Opinion were greatly exaggerated.

The Palmdale Uplift was ignored entirely at the time when it was originally announced, and during the period of growing interest later in 1975. Readers exclusively dependent on La Opinion as a news source would not have heard of the Palmdale Uplift until December 9, 1976, nearly ten months late. All the English-language papers had devoted several articles to the Uplift in both Period II and Period III. Following a hiatus of interest specifically in the Uplift between July and November, interest resumed in December, and it was this reawakened interest that was finally reflected in La Opinion. Even in Period V, however, coverage was mcuh less than in most of the English-language newspapers.

The first of the three articles in La Opinion that mentioned the Uplift reported discussion by Robert Hamilton of the U.S. Geological Survey of studies and observations being made of the Uplift. The second article, on the following day, reported a series of experiments and observations being made in the Mojave Desert region to identify changes in rock structure associated with the Uplift. These studies were being conducted by two scientists from the California Institute of Technology. The third article appeared on December 11. This front-page story reported a USGS scientist's warning of a possible earthquake to occur in the San Fernando or Los Angeles area. Strong tensions building up in the San Andreas fault and the elevation of the earth's surface by about thirty centimeters in the last fifteen years (i.e., the Palmdale Uplift) were cited as reasons for anticipating an earthquake.

Attention to the Palmdale Uplift ceased as quickly as it had begun. The front-page stories on three successive days were inspired by a professional meeting that was not even held in southern California. Afterwards there were no further references to the Uplift during the remaining eighteen and one half months that we monitored.

Professor James Whitcomb of the California Institute of Technology announced his "hypothesis test" on April 21. If his theories and observations and calculations were correct, a moderate to strong earthquake might strike southern California around the Los Angeles vicinity any time within the next twelve months. Most of the attention to Whitcomb took place between the date of the original announcement and early May when the California Earthquake Prediction Evaluation Council refused to give full credit to Whitcomb's "prediction." La Opinion's four articles during this period constitute about the same rate of coverage as most of the English-language newspapers, with only the Los Angeles Times giving substantially more attention to Whitcomb. During the final period when Whitcomb publicly cancelled his prediction, the metropolitan papers (Times and Herald Examiner) each referred to Whitcomb in three more items. But the community papers and La Opinion ignored the cancellation and appeared to consider the Whitcomb hypothesis-test as no longer a real issue after May.

On April 22, the Los Angeles Times featured a front-page article on what several interviewed behavioral scientists believed people's reactions were to Whitcomb's "hypothesis." The conclusion of these behavioral scientists, according to the Times, was that Whitcomb's "so-called prediction" would probably not make a significant psychological difference because it was too vague. Reportedly these experts shared the belief that advanced earthquake prediction knowledge is psychologically advantageous in the long run (LAT, April 22, 1976). The Spanish-language newspaper featured a front-page article on April 24 which

expressed a contrasting point of view. The article in La Opinion reported that some individuals were very worried about the possibility of a quake, others reportedly prayed, and the rest portrayed the same sort of resignation as was depicted in the film "Earthquake" (LO, April 24, 1976). There is an interesting consistency here with the dramatized accounts of highly emotional response to the Guatemala earthquake.

There were no other substantial differences between La Opinion and the English-language newspapers in the treatment of Whitcomb's announcement. For example, the article that appeared on the front pages of La Opinion on April 21 reported on Whitcomb's "prediction" in a very similar way to all the metropolitan and local papers. Details concerning magnitude, location, method, and so forth were provided in the article. Like the other papers, La Opinion quoted Whitcomb as having stated that "the uncertainty of the magnitude, location, and time prevent the theory from being of great use by the public."

La Opinion also reported on Los Angeles City Councilman Louis Nowell's request to file legal action against Whitcomb and Caltech because of the forecast. According to La Opinion's article, "Because of the uncertainty of the prediction, Whitcomb cannot recommend any preventive measures. When asked if he would buy a house in the San Fernando Valley he responded, 'I would if I had the means'" (LO, April 23, 1976). Similar articles appeared in the Santa Monica Evening Outlook and San Gabriel Valley Tribune on that same day. The last article by La Opinion to discuss Whitcomb appeared on May 3, 1976. This report dealt with CEPEC's evaluation of Whitcomb's prediction and his methodology. As was reported by the Los Angeles Times, Herald Examiner, and Santa Monica Evening Outlook, Whitcomb's theory was reported to have been rejected. It was stated in La Opinion that "Whitcomb's prediction that an earthquake will take place near the San Fernando Valley area in a year is not based on convincing evidence" (LO, May 3, 1976).

Henry Minturn became the subject of great interest during the latter part of November, 1976, when he predicted an earthquake to occur in southern California on December 20. His claims of success in predicting past earthquakes in various parts of the world and the specificity of date and location for his prediction helped to win him considerable attention. Television and radio were his greatest publicizers. Each of the English-language newspapers devoted several articles to him, though the tone was generally skeptical, culminating in a devastating exposé of his lack of verifiable professional credentials in the Los Angeles Times. Whether by inadversion or good judgment, La Opinion ignored Minturn and the Minturn controversy entirely. We were unable to find any references to Henry Minturn in La Opinion from the time of his original announcement until the end of the monitoring period on December 31, 1978.

The general treatment of prediction and predictions in La Opinion can best be described as haphazard and not attuned to the local situation. Excessive reliance on internationally syndicated news and the lack of attention to scientific news generated locally appear to explain the pattern. Of local events, only the Whitcomb announcement received reasonably comprehensive coverage, and this near prediction was reported as essentially discredited. The Uplift was discussed only within a one-week period, and then as the report of a meeting being held 400 miles away. The awareness of an awesome and developing earthquake threat to southern California residents conveyed in English-language papers was absent from the pages of La Opinion. Insofar as prediction and predictions are discussed, they seemed largely remote and irrelevant to the immediate concerns of southern California residents.

Earthquake Preparation and Safety

If earthquake prediction topics were slighted in La Opinion, earthquake preparedness and safety topics were almost ignored. Throughout the three year

study period we found only fifteen articles on these topics, none of which was located on a front page. There were no articles until Period III (the Whitcomb period), and four of the fifteen occurred at this time. Distribution of the fifteen articles in La Opinion by period and specific topic is indicated in Table 13.

The few articles on earthquake preparedness dealt with community preparedness rather than individual and family preparedness. An article on May 5, 1976, reported on a UNESCO-sponsored international conference on earthquakes which was held in Paris between April 10 and 19. The article was prefaced by reference to the Guatemalan quake of February 4, 1976, as an example of what a severe earthquake can do to a country. The question was then asked, "How could we save ourselves from such awful disasters?" The remainder of the article featured different themes discussed at the conference. The main discussion revolved around earthquake prediction, hazards, and safety measures that could be taken to reduce the danger posed by such natural disasters as floods and earthquakes. The risk posed by nuclear power plants, especially in California, if they were to collapse during an earthquake, also received attention. Discussion of preparatory measures in La Opinion dealt exclusively with steps that organizations and responsible officials could take when planning the construction of power plants and other community facilities. There were no tips for the ordinary family or individual to follow to protect themselves where they lived or worked in the event of earthquake disaster, or in preparation for a predicted quake. All the English-language newspapers featured both individual articles and series on personal earthquake preparation.

TABLE 13

LA OPINION COVERAGE OF PREPAREDNESS AND SAFETY

Specific topic	Periods 1	2	3	4	5	6	7	8	9	10	11
Prepatory measures	0	0	2	0	0	0	1	1	0	0	0
Individual and family preparedness	0	0	0	0	0	0	0	0	1	0	0
Building safety	0	1	1	1	1	0	0	0	0	1	1
Dam safety	0	0	0	0	0	0	0	1	0	0	0
Nuclear power plant safety	0	0	2	0	0	0	0	1	0	0	1
All articles	0	1	4	1	1	0	1	3	1	1	2

But readers who were exclusively dependent on La Opinion for news would have been deprived of valuable personal survival information made available to readers of all the monitored English-language newspapers.

There was only one reference to dam safety, and quite limited reference to building and nuclear power plant safety. The most extensive treatment of building safety appeared on February 2, 1977, in connection with a discussion of causes for the destruction of buildings in the 1906 San Francisco earthquake. It was reported that most of the damage was caused by fires. The rest of the damage was from the collapse of buildings which had been built without sufficient attention to safety specifications. The main point in the article was that building construction is a crucial factor in preventing serious damage and injury as a result of earthquakes.

Subsequent items reported the unsafe construction of the Los Angeles Public Library and repeated warnings about brick buildings built prior to 1933.

Two articles that discussed nuclear power plant safety in La Opinion appeared on April 21 and May 25, 1976. The first story reported that the supporters of Proposition 15 issued a statement by five geologists that public utilities had failed to take adequate steps to safeguard nuclear power plants from the possible damages caused by earthquakes. This report was made public bya group called "Californians for Nuclear Safeguards." The report condemned public services for systematically choosing hazardous areas, such as sites near faults which have originated earthquakes in the past. According to this article the PG & E officials criticized the report as a reprocessing of previous erroneous explanations of the events. The San Gabriel Valley Tribune and Valley News had similar articles on this issue on April 21. Both of these papers discussed the report in the same way. The reporting by La Opinion was no different from that of the Tribune or Valley News.

The article that appeared in the inside pages of La Opinion on May 25 reported on the Humboldt Bay Nuclear Power Plant. Reportedly the Nuclear Regulatory Commission had issued a formal order requiring this plant to be

reinforced against an earthquake. The plant had been scheduled to close down for refueling during June of 1976, but according to this article, the plant would continue to be closed until the Nuclear Regulatory Commission deemed it safe. The same story was also found in the San Gabriel Valley Tribune on the same day. The reporting by the two newspapers was practically the same.

Letters to the Editor and Editorials

All of the seventeen letters written to the editor of La Opinion dealt with earthquake events. Most of the letters were published between February and May of 1976. During this time there were fifteen letters written by various individuals who wished to express their feelings about the devastating earthquake that struck Guatemala on February 4, 1976.

The letters that discussed the Guatemalan quake generally touched on the consequences of the quake on the affected areas, as witnessed by several people who were visiting Guatemala at that time; the call for aid to the United States and all Latin American countries; the expression of gratitude by several Guatemalans residing in Los Angeles for the response and the solidarity of Latin American countries and communities. There was one letter written on February 4, 1977 by a United States citizen who was working in Guatemala at the time of the quake. The purpose of this letter was to provide an account of his experiences during the quake and to commemorate the first anniversary of this devastating natural disaster.

There were three editorials dealing with earthquakes in La Opinion between January 1, 1976,and June 30, 1977. The first appeared on February 7, 1976,

and dealt with the overall response from foreign countries and/or organizations to the Guatemalan quake. This editorial also touched on the "human solidarity" manifested by Latin American countries and other nations to the call for aid. The second editorial appeared on June 10, 1976. Its purpose was to commemorate the San Francisco quake of April, 1906. The last editorial was printed on May 5, 1976. The topic of earthquake prediction was discussed. The Guatemalan quake of February 4 was mentioned as an example of the devastating consequences of a severe quake.

Summary

To what extent would readers primarily dependent on the Spanish-language newspaper, La Opinion, gain a different view of the earthquake threat facing California than readers of the major metropolitan and community newspapers in the English language? Except in the treatment of the Guatemala earthquake there is no systematic difference in the reporting of similar events. La Opinion renders into Spanish the news as it comes to them from the same international news services used by English-language newspapers.

But in coverage and emphasis, the exposure would be quite different. La Opinion overwhelmingly features accounts of destructive earthquakes in remote areas of the world, devoting a far greater proportion of coverage to these events and featuring more of them on front pages. Events and concerns affecting the readers in their homes, their neighborhoods, and their local communities are greatly underreported. We found no article or series on personal earthquake preparedness. Dam safety was mentioned only once, in a community where many residents live in potential inundation areas. Building safety and nuclear power plant safety and community earthquake preparedness received only scant

attention. The Southern California Uplift was not mentioned for nearly ten months, and then only on three consecutive days in reporting an earthquake conference. Readers were informed early of the Whitcomb "prediction," but not of its cancellation. Advances in prediction research and techniques were mentioned sporadically.

But the outstanding difference was in the attention and characterization given to the Guatemalan earthquake. The largest concentration of earthquake related items in La Opinion consisted of articles, editorials, and letters dealing with the Guatemala earthquake during the span of one month. The treatment of the Guatemalan quake was different from the treatment of other quakes and from the treatment in English-language newspapers. The emotional reactions of individuals to the quake were described in unusually dramatic terms, the quake was described as an occasion for demonstrating the international solidarity of fellow Latin Americans and Latin-American nations, and there was a search for the deep religious meaning of the event.

It will be interesting to see whether these themes are incorporated into the perspectives of individual readers of La Opinion interviewed in our study. While earthquakes elsewhere are treated in the same fashion as English-language newspapers do, the question is whether a more emotional and mystical response to personally meaningful disaster applies also to the prospect of local disaster. The unbalanced newspaper coverage suggests that no such transfer is made. The concern for dispossessed ethnic kin in Central America has not instigated concern over the immediate personal risk of earthquake disaster in southern California, and may even have displaced it in the attention of La Opinion readers.

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CHAPTER FOUR

THE ETHNIC COMMUNITIES

Before exploring differences in the perception and response to earthquake threat, we must note differences in the social characteristics in the three populations. We shall begin with demographic characteristics and conclude with values and patterns in the social and cultural life of the communities that seem relevant to earthquake response.

Personal Characteristics and Values

Age and household composition. The sampling design has successfully produced almost identical proportions of men and women in the three samples, so we need not be concerned with different sex distributions in explaining differences we find in response to earthquake threat. There are consistently more women than men in the samples, though the 58-to-42 percent division is not so unbalanced as to leave male attitudes unexpressed.

Age differences, on the other hand, are substantial and may be quite important as we interpret later findings (Table 1). White Anglos in the control group are distinctly older than either the Blacks or the Mexican Americans, and the Blacks are slightly older than the Mexican Americans. The groups have about equal representation in the 34 to 50 year category. But many more of the White Anglos are over fifty. The offsetting discrepancy

TABLE 1

AGE, MARITAL STATUS, AND HOUSEHOLD COMPOSITION, BY ETHNICITY

Personal or household characteristic	Black	Mexican American	White Anglo
Age			
17-25	25.5	27.7	16.3
26-33	23.9	27.7	20.5
34-50	27.8	24.4	25.1
51-90	22.8	20.2	38.1
Total	100.0	100.0	100.0
Marital status			
Married	40.4	64.4	50.1
Single	59.6	35.6	49.9
Total	100.0	100.0	100.0
Adults in household			
One	44.5	21.3	36.6
Two	43.8	59.0	51.8
Three	7.9	10.1	9.2
Four or more	3.8	9.6	2.4
Total	100.0	100.0	100.0
Children in household			
None	45.4	34.0	66.0
One	20.5	20.8	13.2
Two	15.3	20.2	12.8
Three	8.9	11.7	5.5
Four or more	9.9	13.3	2.5
Total	100.0	100.0	100.0
School children in household			
None	56.9	51.6	71.3
One or more	43.1	48.4	28.7
Total	100.0	100.0	100.0
Head of household			
Male head	57.7	74.5	60.4
Female head	39.2	21.8	28.7
Head not designated	3.1	3.7	10.9
Total	100.0	100.0	100.0

is greatest in the under-26 rubric.

There are also important differences in household composition. To begin with, the groups differ in marital status. In this case, however, the White Anglos are intermediate, with the highest rate of married respondents among Mexican Americans and the lowest rate among Blacks. The control sample divides equally between married and single respondents. But the Black ratio is three to two single and the Mexican American ratio is more than three to two married. Since the difference between Blacks and White Anglos might be partially explained by the age differences, we have calculated marriage rates separately in four age categories (Table 2). The pattern of differences, with most Mexican Americans and fewest Blacks married, applies to all age levels. Under age 34, more than twice as many Mexican Americans as Blacks are married, with White Anglo rates closer to Black than Mexican American rates. In the older age brackets the differences are no longer large enough to be statistically significant. Consequently, the ethnic differences appear to reflect a disposition for Mexican Americans to marry much younger than White Anglos, and for Blacks to delay marriage even longer. But the rates of eventual marriage are not very different. These differences must be interpreted cautiously because couples living together sometimes report themselves as married and sometimes as single. But it seems implausible that differences so great as these could be explained entirely by differing dispositions toward frankness in the interview.

Whether the respondent is married tells us little about the nature of the household since the unmarried respondent may live in a household headed by a married pair or may have established a separate household. Separate tabulations for number of adults in the household and number of children in the household (Table 1) show that Mexican Americans most frequently live in large households.

TABLE 2

PERCENT MARRIED BY ETHNIC GROUP AND AGE

Age	Black	Mexican American	White Anglo
17-25	20.8	55.8	35.3
26-33	37.2	78.8	48.0
34-50	45.2	67.4	64.6
51-90	46.4	52.6	48.1

Ethnic differences in age brackets 17-25 and 26-33 are significant with $P < .001$; differences in age brackets 34-50 and 51-90 are not significant.

More Mexican Americans than either Blacks or White Anglos live in households with two or more adults and with two or more children. Blacks, who appear to delay marriage longest, also most frequently live in one-adult households. However, they are less likely to live in households without children than White Anglos. Nearly two thirds of the White Anglo control group live in households without children.

The presence of school children in the household is often thought to create or intensify household linkages to the neighborhood and the larger community, though findings from our general survey cast some doubt on this assumption (Turner et. al, 1979, p. 18). While slightly more Mexican American than Black respondents live in households with children in school, substantially more from both groups have school children in the home than is true for the White Anglo control group (Table 1). Since these differences may correspond with the age differences we have already observed, we have made separate comparisons while holding age constant within the four age brackets used earlier. From Table 3 it is clear that substantial differences remain, but the pattern is more complex than was apparent heretofore. Within the two age brackets from 26 to 50 years of age the differences are in the same direction as before, but the difference between Mexican Americans and both Blacks and White Anglos is augmented. Young and middle aged adult Mexican Americans are considerably more likely to live in households with school children than Blacks or White Anglos. Over the age of fifty the differences disappear. In light of common assumptions about persisting extended family patterns among Mexican Americans and possibly among Blacks, this finding may be surprising. Nearly nine out of ten of the older respondents in each of the groups live in households without school children. If the extended family remains a substantial force in the lives of these urban residents, it must operate by linking

TABLE 3

SCHOOL CHILDREN IN THE HOUSEHOLD BY AGE AND ETHNICITY

Age	Percent with school children in the household		
	Black	Mexican American	White Anglo
17-25	40.0	34.6	16.7
26-33	49.1	61.5	35.7
34-50	66.7	80.4	58.5
51-90	10.4	11.6	10.5

separate households rather than through common households.

In the age bracket from 17 to 25 years, more Blacks than Mexican Americans live in households with school children, though the difference is small. Substantially fewer White Anglos live in households with school children. The slight reversal of the difference between Mexican Americans and Blacks could mean that young Black adults are later than Mexican Americans in setting up independent households. We have already established that Blacks marry later, but the fact that nearly 90 percent of the Black respondents live in one- or two-adult households weakens the plausibility of this interpretation. It seems more plausible to infer that Blacks have children younger. Other equally plausible interpretations could undoubtedly be deduced.

Characterization of the household is not complete without identifying the sex of the head. While modern households eschew the term "head of household," the designation still appears to be understood and used in most American families. The question, "Who is considered the head of this household?" was included in the interview as an aid to establishing the household socio-economic standing. But the answers also illuminate another difference among ethnic groups in Los Angeles. Just as the Mexican Americans appear to be the most traditional in marrying early and living in large households with children, they also most frequently identify a male as head of the household (Table 1). While the majority of Blacks also designate a male head, more Blacks than either Mexican Americans or White Anglos identify a female as head. White Anglos are intermediate in both respects, but are less likely than the other groups to find the term applicable to their household situation.

In order to bring some of these characteristics into a more comprehensive characterization of the household, we have grouped households into types

according to number of adults, presence or absence of children, and sex of head. The distribution of the three ethnic groups within these three types is shown in Table 4. In households with more than one adult we have combined instances in which the head is explicitly male and instances in which no one is designated as head, including under "female head" only those households in which the respondent explicitly designated a female member as head. The effect has been to underestimate slightly the true number of female-headed households. But we lack the information necessary for a more perfect classification.

Very few Mexican American males live alone, compared to both Blacks and White Anglos. The number of females who live alone is not very different between Blacks and Mexican Americans, but more White Anglo females live alone. The disproportionate number of Black female-headed units shows up in households with children, whether they include one, two, or three or more adults. The prevalence of the more traditional Mexican American household with a male head shows up equally clearly for units of two or more adults that include children. If we look for preponderant patterns, more than half of the Mexican Americans live in households consisting of two or more adults and one or more children, with a male head (or at least without a female explicitly acknowledged as head). Much smaller proportions of both Blacks and White Anglos live in such households. Very few Mexican American males live by themselves. Approximately two thirds of the White Anglo respondents live in households without children. When there are children, the household is quite infrequently female-headed, except when the female is the only adult. Just over half of the Blacks live in households with children, and a few more of these are male headed (or not explicitly female headed) than are explicitly female headed. The proportion of Blacks who live in households with children

TABLE 4

HOUSEHOLD COMPOSITION BY ETHNICITY

Household composition	Black	Mexican American	White Anglo
Adult-only household:			
One person, male	15.0	3.7	12.4
One person, female	10.9	9.6	19.5
Two persons, head not explicity female	14.0	14.9	24.8
Two persons, head explicitly female	1.7	1.1	2.9
Three or more persons, head not explicitly female	2.8	4.2	5.5
Three or more persons, head explicitly female	1.0	0.5	0.9
Adult and child(ren) household:			
One adult, male	1.0	0.0	0.3
One adult, female	17.4	8.0	4.4
Two adults, head not explicitly female	22.5	39.4	23.0
Two adults, head explicitly female	5.8	3.7	1.1
Three or more adults, head not explicitly female	5.5	14.4	5.0
Three or more adults, head explicitly female	2.4	0.5	0.2
Total	100.0	100.0	100.0

and a female head is greater than for either of the other groups, but it is still much less than a majority.

Social class and economic status. It is well known that members of minority ethnic and racial groups are not positioned equitable in the social and economic class structure of the community. Differences in educational opportunity and achievement are often of critical importance. Educational differences among our three samples are marked and consistent. White Anglos have much more formal schooling than Blacks or Mexican Americans, and Mexican Americans have much less than Blacks (Table 5). If we use high school graduation as the critical level, the great difference is between Blacks and Mexican Americans, with Blacks not very far behind White Anglos. Thus, 82.5 percent of White Anglos, 73.1 percent of Blacks, and only 38.8 percent of Mexican Americans are high school graduates. Black schooling falls off after high school graduation, so that the Black rate of college graduation is about midway between the White Anglo and Mexican American rates.

Surprisingly, the proportion of respondents in each group who work full time does not vary enough to be statistically significant. But differences in household income are again substantial. White Anglo household incomes are distinctly higher than Black and Mexican American incomes. Median incomes for Blacks and Mexican Americans are quite similar, but the distributions are different. Mexican Americans are disproportionately concentrated in the middle income brackets, while Blacks include more households at both extremes. In this respect the Mexican Americans are a more homogeneous group than the Blacks.

Household income may be a poor index of economic sufficiency unless

TABLE 5

SOCIAL AND ECONOMIC STATUS BY ETHNICITY

Status variable	Black	Mexican American	White Anglo
Educational attainment			
Less than high school grad.	26.8	61.2	17.6
High school graduation	35.1	24.4	31.6
Some college	26.1	11.7	28.7
College graduation	12.0	2.7	22.1
Total	100.0	100.0	100.0
Work status			
Working full time	56.0	59.6	61.0
Not working full time	44.0	40.4	39.0
Total	100.0	100.0	100.0
Household income			
Less than $6,000	37.4	25.6	20.1
$6,000-$11,999	32.3	38.1	21.3
$12,000-$19,999	15.6	29.2	28.4
$20,000 and over	14.7	7.1	30.2
Total	100.0	100.0	100.0
Number earning income			
None	33.5	17.6	23.6
One	41.8	52.1	44.0
Two or more	24.7	30.3	32.4
Total	100.0	100.0	100.0
Adults and children dependent on household income			
One	24.4	11.8	32.8
Two	21.0	18.2	27.3
Three	18.6	17.6	14.1
Four	15.9	19.3	13.3
Five or more	20.1	33.1	12.5
Total	100.0	100.0	100.0
Household income adequacy			
Low	44.6	44.6	17.0
Low medium	24.2	29.2	24.4
High medium	18.3	19.6	28.7
High	12.9	6.6	29.9
Total	100.0	100.0	100.0
Occupational status			
Low	38.0	56.4	20.1
Low medium	32.4	25.7	27.6
High medium	16.8	14.0	31.4
High	12.9	3.9	20.9
Total	100.0	100.0	100.0

size and composition of the household are taken into account. We look first at the number of people contributing earned income to the household. There is little difference among the groups when we compare one-income households with two-or-more income households. However, the largest proportion of Black households have no one in the household contributing earned income. Mexican Americans have the fewest households with no one contributing earned income, while White Anglos are intermediate.

After estimating total family income, respondents were asked how many adults and children, including themselves, were dependent on the family income. Answers to this question reinforce the earlier findings on household size. White Anglo families are most likely to divide the family income among only one or two people. Over half of the Mexican American family incomes must be divided among four or more people. Blacks fall between the other two groups.

We have attempted in two ways to make more comprehensive sense of wage-earner status and income in relationship to household. First, it is obvious that the absence of a wage earner in the household can have different meanings, in some cases (unemployment) indicating economic stringency, and in other cases (student household or retirement) often indicating economic sufficiency. We return to the twelve types of family composition identified earlier, consolidating them into six to avoid excessively small numbers of cases in cells. Each of the six types is then subdivided according to employment and retirement status. The number of student households was too small for separate analysis. The resulting frequencies have been examined in two ways, separately within each of the household-composition types, and for the entire ethnic group (Table 6). We shall summarize the ethnic comparisons in that order.

Examination of one-adult households without children suggests the

TABLE 6

HOUSEHOLD COMPOSITION AND WAGE EARNER STATUS BY ETHNICITY

Household composition and wage earner status	Percent by household Type			Percent of total group		
	Black	Mexican American	White Anglo	Black	Mexican American	White Anglo
One male, no children:						
Working full time	54.5	71.4	62.2	8.2	2.7	7.7
Unemployed, part time	29.6	14.3	14.3	4.4	0.5	1.8
Retired	13.6	14.3	19.3	2.0	0.5	2.4
Keeping house, other	2.3	0	4.2	0.3	0	0.5
Total	100.0	100.0	100.0			
One female, no children:						
Working full time	40.6	55.6	38.5	4.4	5.3	7.5
Unemployed, part time	28.2	11.1	15.0	3.1	1.1	2.9
Retired	25.0	22.2	36.4	2.7	2.1	7.1
Keeping house, other	6.2	11.1	10.1	0.7	1.1	2.0
Total	100.0	100.0	100.0			
One male, child(ren):						
Working full time	(1)	0	(1)	0.3	0	0.1
Unemployed, part time	(1)	0	(1)	0.3	0	0.1
Retired	0	0	(1)	0	0	0.1
Keeping house, other	0	0	0	0	0	0
	(2)	0	(3)			
One female, child(ren):						
Working full time	32.7	40.0	61.9	5.8	3.2	2.7
Unemployed, part time	38.5	33.3	26.2	6.8	2.7	1.2
Retired	0	0	0	0	0	0
Keeping house, other	28.8	26.7	11.9	5.1	2.1	0.5
Total	100.0	100.0	100.0			
Two or more adults, no children:						
Two working full time	20.7	12.8	23.3	4.1	2.6	7.9
One working full time	36.2	71.8	43.7	7.2	14.9	14.9
Retired, no full time worker	22.4	7.7	17.1	4.4	1.6	5.9
No full time worker or retired	20.7	7.7	15.9	4.1	1.6	5.4
Total	100.0	100.0	100.0			
Two or more adults, child(ren):						
Two working full time	31.1	22.0	25.6	11.2	12.8	7.5
One working full time	43.4	66.1	67.3	15.7	38.3	19.7
Retired, no full time worker	4.7	0	1.8	1.7	0	0.5
No full time worker or retired	20.8	11.9	5.3	7.5	6.9	1.6
Total	100.0	100.0	100.0			

following observations. The majority of men living alone in all three ethnic groups are working full time. The majority of Mexican American women living alone are also working full time. Among Black and White Anglo women living alone the modal group, but less than a majority, are working full time. Mexican Americans of both sexes are less likely than either Blacks or White Anglos to live alone unless they are working full time. For adults living alone, both men and women, unemployment is highest for Blacks and lowest for White Anglos. Retired people constitute a larger share of one-person households among White Anglos than among Blacks or Mexican Americans, and especially for females.

There are too few one-male-adult households with children for analysis. The principal differences among one-female-adult households with children separate White Anglos from both Blacks and Mexican Americans. Considerably more of the White Anglo females are working full time and considerably fewer say they are unemployed or "keeping house." Thus while there are proportionately more Black-female-one-adult households with children, the pattern of self-sufficiency in such households is similar for Blacks and Mexican Americans. White Anglo one-female-adult households with children, on the other hand, are substantially more likely to be self-sufficient.

In two-adult households, with and without children, and in all ethnic groups, the modal pattern is the traditional pattern of one full-time wage-earner. In all instances except Blacks without children, the second most frequent pattern consists of two full-time wage earners in the household. With or without children, more Blacks are in households with no one working full time, whether because of retirement or unemployment and under-employment. There are also consistently fewer Blacks in the traditional one-full-time-wage-earner household. For multiple-adult households with children, the

pattern for Mexican Americans and White Anglos is generally similar, except for a higher incidence of unemployment and underemployment among Mexican Americans. But in multiple-adult households without children, many more Mexican Americans than Blacks or White Anglos are in households with one full-time wage earner and fewer are in households with no wage-earner.

Overall, we see a more conventional pattern among Mexican Americans, of waiting until they have full-time employment to establish households, unless there is a child, and of organizing the household around just one principal wage-earner. Among Blacks we see continuing evidence of more economic insufficiency, and among White Anglos more evidence of economic self-sufficiency, especially among one-female-adult households with children.

We can look at these same figures again, but this time to describe the composition of the total sample for each ethnic group, using the second set of percentages in Table 6. Blacks stand out from the other two groups in having more unemployed or underemployed males living along; more females in one-adult households with children at all employment levels and just "keeping house"; and fewer multiple-adult households without children in which there is just one principal wage earner. Mexican Americans stand out for the larger proportion who live in multiple-adult households with one principal wage earner; the smaller number of males living alone, whether fully employed, unemployed and underemployed, or retired; and the smaller number in multiple-adult households without children with two full time wage earners or no wage earner. White Anglos include more retired females living alone, more two-wage-earner multiple-adult households without children, and fewer multiple-adult households with children in which there is no regular wage earner.

As a second way of looking at income and dependency comprehensively,

an effort has been made to adjust the reported family income so as to take account of the number of ways it must be divided. It would be unrealistic simply to divide family income by the number of persons dependent on it since it is less expensive for two people to live in one household than in two households, and since the needs of children and adults are different. The Bureau of Labor Statistics of the US Department of Labor prepares annual estimates of the income required for an adequate standard of living in households according to the number of household members in various age brackets. After simplifying the Bureau's household categories we translated the ratios into an index of income adequacy, which was computed for the three groups (Table 5). By this measure the income adequacy of Mexican Americans and Blacks is quite similar, though a few more Blacks have reached high income adequacy. But White Anglos are substantially higher in income adequacy than either of the minority groups.

The socioeconomic rating of one's occupation is often the best general indicator of social and economic class position, according to many sociological investigations. The usual occupation of the household head has been ascertained in each instance and classified according to the Featherman revision of the Duncan scale to fit 1970 Census occupational categories. As with other variables, we have arbitrarily divided the numerical continuum into four categories with approximately equal frequencies in the basic survey. The group differences are strong and linear. The socioeconomic status of White Anglos as measured by the occupation of the household head is substantially and consistently higher than the socioeconomic status of Blacks, and the status of Blacks is equally higher than that of Mexican Americans.

These measures of social and economic standing can be summarized by observing that Mexican Americans have less education and work at less pres-

tigious occupations than Blacks, but are just about on a par with Blacks when it comes to income for meeting household members' needs. Whites are consistently more advantaged than Blacks and Mexican Americans by all measures.

Length of residence. A final demographic variable is length and stability of residence in southern California. White and Mexican settlement in southern California goes back several generations, while massive Black migration to the area dates largely from the second World War. At the same time there has been continuing and sometimes increasing migration of Mexicans in recent years across the national border. In our samples, White Anglos show the longest periods of residence in southern California, while Blacks and Mexican Americans show different patterns (Table 7). More Mexican Americans than either Blacks or White Anglos have been in southern California for only a short time, but more Mexican Americans than Blacks have been here for a relatively long time. More Blacks than Mexican Americans have been in southern California for an intermediate period of time, but fewer Blacks than either Mexican Americans or White Anglos have been here for a relatively long time. Thus, the differences among our sample appear to reflect accurately the known differences in migration patterns for the three populations. The Mexican American community is the more heterogeneous in this respect, combining a substantial segment of long-time residents with a sizable group of recent migrants.

If we look at residence in the local community, the differences are smaller, White Anglos continue to show the greatest residential stability, with Mexican Americans being a little more stable than Blacks. Thus, the important differences among the three groups are not in their residential stability after they come to southern California but in the recency of their migration to the area.

TABLE 7

LENGTH OF RESIDENCE BY ETHNICITY

Length of residence	Black	Mexican American	White Anglo
In southern California			
11 years or less	27.7	36.2	18.7
12-23 years	34.3	29.3	32.1
24-33 years	25.0	15.4	24.3
34 years or more	13.0	19.1	24.9
Total	100.0	100.0	100.0
In local community			
2 years or less	31.1	25.5	26.0
3-7 years	28.1	29.3	23.3
8-17 years	21.6	26.6	24.1
18 years or more	19.2	18.6	26.6
Total	100.0	100.0	100.0

Attachment to the local community. Considering length of residence in the community naturally leads us to ask how strongly people are attached to the local community. The orienting hypothesis is that when people are attached to the community they take an interest in local concerns, absorb available local wisdom, and prepare to cope with problems that are distinctive to the local area. We expect more understanding of earthquake hazard and more constructive action in preparing for earthquakes among people who are attached to the local community tha among people who are not. Attachment is partly subjective and partly objective. We employed a composite index of attachment which includes the feeling that the local community is one's real home, personal and family involvement in the social life of the community, and length of residence in the local community. According to this measure, White Anglos are most attached to whatever local community they live in, Mexican Americans are least attached, and Blacks are intermediate (Table 8). The differences, though statistically significant, are not large, and the relationship is not linear.

Since we have already examined length of residence in the local community, which is a part of the index, we must look separately at the subjective and participatory measures that are also included. Respondents were asked the name of the community where they lived, and then asked:

> Do you think of (. . .) NAME OF COMMUNITY as your real home, the community that is really important to you, or is it just a place you happen to be living in now?

From 66 to 72 percent of the respondents identified their community as their real home, and differences among the groups were not statistically significant. Similarly, the groups did not differ in the proportion of their friends who lived within a three-mile radius of their home. However, differences in group

TABLE 8

COMMUNITY ATTACHMENT BY ETHNICITY

Form of community attachment	Black	Mexican American	White Anglo
Index of community attachment			
Low	27.5	22.0	22.2
Low medium	25.0	37.1	26.6
High medium	28.7	26.4	28.5
High	17.8	14.5	22.7
Total	100.0	100.0	100.0
Group involvements			
None	41.7	52.9	46.9
One	33.5	32.1	23.8
Two	9.3	6.4	13.3
Three or more	15.5	8.6	16.0
Total	100.0	100.0	100.0
How likely to more in 5 years			
Definitely move	27.7	14.4	17.7
Probably move	18.5	30.3	26.4
Don't Know	7.7	8.5	3.9
Probably not move	25.7	23.9	31.3
Definitely not move	20.4	22.9	20.7
Total	100.0	100.0	100.0
Home ownership			
Owner occupied	35.5	43.6	51.8
Not owner-occupied	64.4	56.4	48.2
Total	100.0	100.0	100.0
Relatives in 3-mile radius			
None	33.2	30.3	57.0
A few of them	42.7	35.1	28.4
Some of them	13.4	20.2	7.4
Most or almost all of them	10.7	14.4	7.2
Total	100.0	100.0	100.0

participation, intention to move, and home ownership account for the differences in the index of attachment. White Anglos are most involved in social, religious, and political groups and organizations within a three-mile radius of the home, and Mexican Americans are least involved. White Anglos most often say they will probably not move in the next five years, Blacks most often say they will definitely move, and Mexican Americans most often say they will probably move. White Anglos are also highest in home ownership, with Blacks lowest.

The three groups do not differ importantly in their subjective identification and informal social integration into the local community. The differences in attachment arise in more formal and organized types of integration, and in having satisfactory long-term housing arrangements. We did not include proximity to relatives as an indication of community attachment because of uncertainty over whether the presence of relatives nearby establishes a bond to the community or positions the extended family as a competitor to the community for the individual's attention. If we had included proximity of relations, the results would have been somewhat different. White Anglos are substantially less likely than either Blacks or Mexican Americans to have relatives living within a three-mile radius. And Mexican Americans have a larger proportion of their relatives living nearby than Blacks. Perhaps it would be more correct to speak of different styles of community attachment rather than different degrees of attachment. The three groups are rather similar in the length of their residence in the local community, their subjective identification with the community, and having friends nearby. But while White Anglos find their decisive outreach into the community through participating in groups and organizations, Mexican Americans achieve their outreach by establishing extended family networks locally. Blacks are more heterogeneous in the mode of community integration they follow, having more

organizational involvement than Mexican Americans and more extended family involvement than White Anglos.

For Mexican Americans, language options undoubtedly have an effect on the nature and extent of community attachment and involvement. English is the language most frequently spoken in the home for only 38.8 percent of the Mexican Americans. Another 10.1 percent live in homes where both Spanish and English are regularly spoken. The remaining 51.1 percent come from homes in which Spanish is the language spoken most frequently.

Newspaper readership provides still another link to the local community and especially to the larger metropolitan region. More White Anglos than Blacks or Mexican Americans read one or more newspapers regularly (Table 9). Though significant, the difference is not great. Readership of individual newspapers shows more variation. The leading metropolitan daily, the Los Angeles Times, is the most frequently read by all groups. But distinctly fewer Mexican Americans than either White Anglos or Blacks read it regularly. The second metropolitan daily, the Herald Examiner, is read by more of both minority groups than it is by White Anglos. Neither paper is sensationalist by usual journalistic standards, but the Herald Examiner is smaller, somewhat less high brow, and is an afternoon rather than morning paper. La Opinion, a regional Spanish language paper, is the sole newspaper read regularly in many of the principally Spanish-speaking households. La Opinion takes the place of the Los Angeles Times as the "standard" newspaper for a substantial minority of Mexican Americans. Nevertheless, the overwhelming majority do not read it. Elsewhere we have noted that coverage of local earthquake and safety news in La Opinion is quite sporadic, and the paper tends to focus attention on the concerns of the international, Western hemispheric Latin community at least as much as the southern California region. Blacks are

TABLE 9

NEWSPAPER READERSHIP BY ETHNICITY

Newspaper readership	Black	Mexican American	White Anglo
Number read regularly			
None	40.0	38.3	28.4
One	38.5	39.9	46.1
Two	16.3	17.0	20.4
Three or more	5.2	4.8	5.1
Total	100.0	100.0	100.0
Papers read regularly			
Los Angeles Times	44.1	26.6	46.2
Herald Examiner	19.8	21.3	11.1
Community paper	10.0	16.5	36.1
La Opinion	0.8	19.1	0.1
Sentinel	6.5	0.0	0.0

much less attached to their leading ethnic paper, the Sentinel, than Mexican Americans are to theirs. Much or all of this difference may be attributable to the considerable number of Spanish speakers among Mexican Americans. Nevertheless, the difference may be a sign that fewer Blacks than Mexican Americans participate intellectually in the subcultures of their respective ethnic communities.

Attachment to both the region and the local community is probably indicated by the practice of reading both a metropolitan daily and a community newspaper, of which there are a large number in Los Angeles County. Considerably more White Anglos than either Blacks or Mexican Americans read a community newspaper regularly. La Opinion takes the place of a metropolitan daily for some Mexican Americans and takes the place of a community paper for others who also read the Times or Herald Examiner. But fewer Blacks than Mexican Americans read a community newspaper. In light of the high proportion of Blacks who read the metropolitan dailies and the much higher levels of schooling for Blacks than Mexican Americans, the low readership of both the racial and community newspapers suggests that many Blacks do not identify themselves strongly with either the racial community or the local (spatial) community.

Group values. The overwhelming majority in each group say that religion is important in their lives (Table 10). But the groups differ in the numbers who say religion is "very important." Blacks are the most religious and White Anglos the least religious, with Mexican Americans intermediate, by this criterion. There are also differences in religious preference. Mexican Americans, as generally supposed, are nearly all Catholic. Blacks are mostly Protestant, with ten percent claiming no church preference and eight percent being Catholic. White Anglos are more heterogeneous. While the majority

TABLE 10

RELIGION BY ETHNICITY

Religion	Black	Mexican American	White Anglo
Importance of religion			
Very Important	72.8	58.0	44.9
Important	20.3	35.9	36.9
Fairly unimportant	5.7	5.5	13.2
Not important at all	1.2	0.6	5.0
Total	100.0	100.0	100.0
Religious preference			
Protestant	79.6	6.4	54.2
Catholic	8.3	90.4	21.0
Jewish	0.0	0.0	8.2
Other	1.6	0.0	1.4
None	10.5	3.2	15.2
Total	100.0	100.o	100.0
Protestant denomination			
Congregational, Disciples of Christ, Episcopalian, Lutheran, Methodist, Presbyterian	13.7	0.5	26.4
Baptist	53.3	2.1	8.5
Pentecostal	10.3	3.2	4.8
Latter Day Saints	0.0	0.0	2.1
Christian Science, Science of Mind, Religious Science	0.3	0.0	2.3
Nondenominational, Unspecified, Other	2.0	0.6	10.1
Total Protestant	79.6	6.4	54.2

give Protestant as their preference, one in five is Roman Catholic, one in seven claims no religious preference, and one in twelve is Jewish.

Not only are the Blacks disproportionately Protestant: the majority belong to a single group of denominations, the Baptist Church. White Anglo Protestants are more diverse in their denominational preferences, though the largest concentration is in the most conventional denominations. The pentacostal or holiness and fundamentalist churches attract a larger share of Blacks than of White Anglos. Most of the very few Mexican American protestants have chosen the Pentacostal or Baptist denominations.

An important measure of a group's values is the kind of problems with which members are most concerned. In approaching the prospective interviewees we did not at first mention our interest in earthquakes. The interview opened with the question,

> First we would like to know what, in your opinion, are the three most important problems facing the residents of southern California today?

The purpose of the question was to see whether earthquakes were mentioned spontaneously. Later we will deal with the issue of how salient the concern with earthquakes was. The many answers people gave have been classified, and we can compare the concerns that were most salient for the three groups.

In Table 11 we have listed the problems most frequently mentioned, giving both the frequency and rank order of mention for each of the three groups. Most respondents gave the full three answers as requested, and first, second, and third answers have been consolidated into a single set of frequencies.

There are important similarities among the three groups. Crime is

TABLE 11

MAJOR PROBLEMS FACING RESIDENTS OF SOUTHERN CALIFORNIA BY ETHNICITY

Problem	Black	Mexican American	White Anglo
	% (rank)	% (rank)	% (rank)
Crime	26.6 (1)	25.2 (1)	14.4 (1)
Cost of living	14.3 (3)	19.1 (2)	13.6 (2)
Unemployment	17.7 (2)	12.9 (3)	6.7 (8)
Social problems	7.8 (4)	9.9 (4)	8.1 (6)
Taxes	6.0 (5)	6.4 (5.5)	11.6 (4)
Resource scarcity	4.5 (7)	5.5 (7)	11.8 (3)
Education & Busing	5.0 (6)	6.4 (5.5)	5.9 (9)
Smog & Pollution	4.1 (9)	5.0 (8)	10.1 (5)
Transportation	3.4 (10)	2.2 (9)	7.2 (7)
Housing	4.3 (8)	1.8 (10)	1.6 (12)
Population density	1.3 (11)	1.5 (11.5)	3.9 (10)
Politics, government	0.9 (12)	0.7 (13.5)	1.6 (11)
Health	0.7 (13.5)	0.7 (13.5)	0.9 (13)
Earthquakes	0.6 (15)	1.5 (11.5)	0.9 (14)
Recreation access	0.7 (13.5)	0.0	0.2 (15)
Climate	0.2 (16)	0.2 (15)	0.1 (17)
City Size	0.0	0.0	0.1 (16)
Other	1.8	1.1	1.7

the most frequently mentioned problem by each of the groups. Cost of living ranks second or third for each group. After these three problems, "social problems" rank high for each of the groups. Social problems include such items as the welfare load, white flight, disagreements on values, and racial antipathy and violence.

The differences are equally striking. First, the Blacks and Mexican Americans concentrate their choices more than White Anglos do. There is more agreement within the minority communities on what the chief problems are--perhaps because the problems are more acute and directly affect more of the people. Thus a quarter each of the Blacks and Mexican Americans named crime while only a seventh of the White Anglos did. Four problems account for two-thirds of all answers by Blacks and by Mexican Americans, while it requires six problems to encompass two-thirds of the White Anglo responses.

The prominence of unemployment as a leading problem chiefly distinguishes Blacks and Mexican Americans from White Anglos. Unemployment ranks second for Blacks and third for Mexican Americans while it comes eighth for White Anglos. The obverse of this difference is the third-place ranking for "resource scarcity" by White Anglos, compared with seventh ranking by both Blacks and Mexican Americans. Resource scarcity includes principally water and energy shortages, and may have been inflated for all groups by the fact that California was in the second year of a serious drought at the time these interviews were conducted. Taxes are also mentioned by more White Anglos than Blacks or Mexican Americans, though the rank order is nearly the same. Smog and pollution attract twice as much attention among White Anglos as among the other groups, as does transportation. Education and busing are mentioned by quite similar, though small, numbers in all three groups, though they rank higher for the minority groups than for the control.

While the most noticeable differences are between White Anglos and the two minority groups, there are also differences between Blacks and Mexican Americans. Unemployment ranks second for Blacks and third for Mexican Americans, while cost of living ranks second for Mexican Americans and third for Blacks. Although not very many people in any group mention housing, Blacks do so with considerably greater frequency than either White Anglos or Mexican Americans.

Another way to summarize these findings is to look strictly at the most salient items that make up two-thirds of all problems mentioned for each group. Crime, cost of living, and social problems are included in the first two-thirds of answers for all three groups. Unemployment completes the list of leading problems for Blacks and Mexican Americans, but ranks much lower for White Anglos. Resource scarcity, taxes, and smog and pollution complete the list of leading problems for White Anglos, but are not in the top problems for the minority groups.

Earthquake Experience and Vulnerability

It has been variously argued that experience with a disaster agent is necessary for realistic understanding or to motivate people for action, or that experience lulls people into false security. Kunreuther (1978) concluded that personal experience with flooding was the most important consideration in motivating flood plain residents to purchase flood insurance. We used a combination of questions about number of prior earthquakes experienced, severity of earthquakes experienced and personal injury and loss of property from an earthquake to create an index of earthquake experience. Although very few respondents are entirely without earthquake experience, White Anglos are more experienced than Blacks and Mexican Americans (Table 12). The two

TABLE 12

EARTHQUAKE EXPERIENCE BY ETHNICITY

Experience, Vulnerability	Black	Mexican American	White Anglo
Earthquake experience			
None	9.9	9.1	7.3
Little	19.6	22.5	10.4
Moderate	40.1	49.7	45.7
Extensive	30.4	18.7	36.6
Total	100.0	100.0	100.0
Damaging quakes experienced			
None	29.6	33.0	17.9
One	49.5	52.8	52.3
Two	15.4	9.3	21.5
Three or more	5.5	4.9	8.3
Total	100.0	100.0	100.0
Injury or property loss from earthquake to self			
No	69.3	78.2	62.9
Yes	30.7	21.8	37.1
Total	100.0	100.0	100.0
Injury or property loss from earthquake to family or close friend			
No	68.3	79.8	59.7
Yes	31.7	20.2	40.3
Total	100.0	100.0	100.0
Feelings during earthquake			
Very frightened	42.5	34.5	27.8
Somewhat frightened	26.4	28.1	27.5
Not very frightened	15.0	20.4	21.9
Not frightened	14.6	16.4	19.9
Enjoyed experience	1.5	0.6	2.9
Total	100.0	100.0	100.0
Experience with other disasters			
None	60.1	78.1	53.7
Limited	12.1	8.2	16.3
Considerable	27.7	13.6	30.1
Total	100.0	100.0	100.0

minority groups have fairly similar median experience scores, but Mexican Americans are more concentrated in the middle range of experience, and more Blacks have had extensive experience. A reanalysis with length of residence in southern California held constant in four time spans mutes the relationship, suggesting that some but not all of the difference in earthquake experience is merely a consequence of years lived in earthquake country.

Some of the components of earthquake experience can be examined separately. White Anglos report having experienced more earthquakes that were strong enough to damage buildings and cost lives than Blacks, and Blacks have experienced more than Mexican Americans. Again, these differences are muted when length of residence is controlled in four time spans, though they do not disappear altogether. The number of quakes experienced may be less important than what quakes were experienced and with what personal effects. Among White Anglos, 75.1 percent experienced the San Fernando earthquake of 1971: 65.8 to 68.5 percent of Blacks and 61.2 to 63.4 percent of Mexican Americans experienced it. Although from two-thirds to three-fourths experienced the last destructive earthquake in Los Angeles County, most were not in the casualty and major destruction zone. More White Anglos and fewest Mexican Americans have personally experienced property loss or injury in an earthquake, and that difference is more persistent when length of residence is controlled than the other aspects of experience.

Respondents were also asked whether a relative, family member, or close friend had ever been injured or suffered property damage in an earthquake. The majority in all groups had no such experience. But again, a considerable number of White Anglos have experienced earthquake loss and casualty vicariously through a close associate, with fewer Blacks, and fewest Mexican Americans having this kind of experience.

Regardless of whether people experienced damage and casualties, how they felt at the time of the experience may determine what lasting effect it will have. After indicating the approximate number of earthquakes they had personally experienced, respondents were asked:

> Thinking back to your experience(s), which of the following best describe(s) your overall feelings during the earthquake(s)? Would you say you were: Very frightened and upset, Somewhat frightened and upset, Not very frightened and upset, Not at all frightened and upset, or Did you enjoy the experience?

Among only those who had experienced earthquakes, the most Blacks and the fewest White Anglos admitted being very frightened. Mexican Americans consistently occupied a middle ground.

Experience with other natural disasters, such as hurricanes, tornadoes, floods, and tsunamis, might at least motivate the earthquake novice to take the local disaster agent seriously. But here, too, White Anglos have had the most experience and Mexican Americans the least. The majority in each group have not experienced other natural disasters, but Mexican Americans stand apart from both Blacks and White Anglos in their lack of experience. Differences between White Anglos and Blacks are small.

Regardless of past experience, people may live and work at the present time in relatively vulnerable or safe structures. It is impossible to assess accurately the extent to which a home is vulnerable to earthquakes. But it is possible to make an approximate assessment by noting type of construction, height of the building, location on level ground or a hillside, year of construction, mobile home construction, and similar characteristics. The index based on these items of information distinguishes about fifteen percent of the total County sample whose homes may be especially vulnerable in some respect from the 85 percent whose homes are not obviously vulnerable. By this criterion, fewer Mexican Americans and Blacks than White Anglos live

TABLE 13

EARTHQUAKE VULNERABILITY BY ETHNICITY

Vulnerability	Black	Mexican American	White Anglo
Residence			
Low vulnerability	92.9	91.0	82.0
High vulnerability	7.1	9.0	18.0
Total	100.0	100.0	100.0
Workplace			
Low vulnerability	86.7	87.8	89.4
High vulnerability	13.3	12.2	10.6
Total	100.0	100.0	100.0

in homes that are vulnerable to earthquakes (Table 13). The differences are not great, however, and they mask a combination of assets and liabilities for each group. White Anglos are most frequently in relatively safe wood frame and stucco structures, but this advantage is offset by the larger numbers in buildings three or more stories in height. More Mexican Americans live in brick, stone, or concrete block structures, but much the largest number live in one-story detached buildings. Blacks are intermediate on most relevant characteristics. While more White Anglos live in new homes, no differences appeared in the relative frequency of pre-1934 structures. On the basis of similar information about workplace, there is no apparent difference among the groups in the earthquake vulnerability of the structures in which they work.

In general, the appropriate conclusion seems to be that the groups are not very obviously different in earthquake vulnerability of home and workplace. In balance, slightly more White Anglos may live in vulnerable wood-frame multi-story structures that are often built with minimal compliance with earthquake safety standards.

Significant Orientations

Attitudes are of varying degrees of generality, ranging from the attitude toward a momentary situation to quite broad and enduring attitudes toward life. It is generally assumed that attitudes of greater generality influence the way people perceive, interpret, and respond to situations. We shall call these broader attitudes orientations. They include the frames of reference and preconceptions that predispose people to understand an earthquake forecast or near prediction or caution in particular ways. The items we examine will mostly be moderately concrete and close to the

situations,sometimes almost blurring into reactions to the current earthquake threat situation. But each has been chosen because it represents a link to a more abstract orientation.

Fatalism about earthquakes. Fatalistic orientations are common in all risk situations. Whether they are truly believed or not, fatalistic attitudes are abundantly expressed by soldiers in combat, circus performers, people with serious health problems, automobile drivers on crowded freeways, and people who receive warnings of impending natural disasters. It has often been asserted that fatalism is especially prevalent among relatively powerless social classes and among people who are culturally closer to peasant and pre-industrial backgrounds. Earthquakes, because they are so dramatically beyond human control and, heretofore, beyond reliable human forecasting, seem especially suitable objects for the crystallization of fatalistic attitudes. In addition, socioeconomic and cultural differences among Blacks, Mexican Americans, and White Anglos should be reflected in different degrees of fatalism about earthquakes.

We devised a measure of fatalism about earthquakes consisting of four statements, each of which applies a generalized expression of fatalism specifically to the prospect for human casualties and property loss from earthquakes. As we anticipated, Blacks are considerably more fatalistic about earthquakes than White Anglos (Table 14). Many more Blacks believe that there is little or nothing that the individual can do to protect against the hazard of earthquakes. But contrary to our expectation, Mexican Americans are no more fatalistic than White Anglos, and may even be a little less fatalistic. The Mexican American pattern is surprising, not only because Mexican Americans in other regions of the United States have been described as fatalistic about physical health (Shannon, 1954), but because of the low

TABLE 14

FATALISM AND INVULNERABILITY BY ETHNICITY

Fatalism/Invulnerability measure	Black	Mexican American	White Anglo
Fatalism Index			
Low	17.0	29.0	25.6
Low medium	16.7	22.0	22.0
High medium	31.5	36.6	35.1
High	34.8	12.4	17.3
Total	100.0	100.0	100.0
"I believe earthquakes are going to cause widespread loss of life and property whether we prepare for them or not."			
Strongly agree	5.6	2.7	5.4
Disagree	21.3	34.4	34.4
Agree	48.3	52.7	52.4
Strongly agree	24.8	10.2	7.8
Total	100.0	100.0	100.0
"If I make preparations for an earthquake, I am almost certain they will work."			
Strongly agree	4.4	6.7	2.5
Agree	32.6	59.8	44.6
Disagree	51.8	31.3	49.4
Strongly disagree	11.2	2.2	3.5
Total	100.0	100.0	100.0
"There is nothing I can do about earthquakes, so I don't try to prepare for that kind of emergency."			
Strongly disagree	12.3	11.4	11.5
Disagree	41.8	54.1	48.1
Agree	35.5	31.3	33.1
Strongly agree	12.4	3.2	7.3
Total	100.0	100.0	100.0
"The way I look at it, nothing is going to help if there were an earthquake."			
Strongly disagree	12.4	10.2	13.3
Disagree	42.7	55.4	58.7
Agree	32.8	30.6	24.5
Strongly agree	12.1	3.8	3.5
Total	100.0	100.0	100.0
Invulnerability: "I don't believe an earthquake could really harm me."			
Strongly agree	1.6	2.1	1.3
Agree	5.4	7.0	6.5
Disagree	43.2	71.0	56.0
Strongly disagree	49.8	19.9	36.2
Total	100.0	100.0	100.0

level of formal education and the low average socioeconomic status of the group.

Review of the four items that make up the fatalism index might shed further light on this finding. The Blacks are consistently more fatalistic than either of the other groups on all items. On three items the differences between White Anglos and Mexican Americans are trivial. Quite similar majorities in the two groups agree fatalistically that earthquakes will cause widespread loss of life and property whether we prepare for them or not, and disagree with the fatalistic views that "there is nothing I can do about earthquakes so I don't try to prepare . . ." and ". . . nothing is going to help if there were an earthquake." But substantially more Mexican Americans than White Anglos reject fatalism by agreeing that "If I make preparations for an earthquake I am almost certain they will work."

Examination of the individual items enhances the credibility of the main findings, that substantially more Blacks are fatalistic, and that Mexican Americans and White Anglos are not very different on this dimension. With only the evidence before us it would be risky to generalize from the one item on which Mexican Americans are substantially less fatalistic than White Anglos. A fifth item, however, may help us to make an interpretation.

Respondents were presented with a statement claiming personal invulnerability to earthquake injury. As we can see in Table 14, very few people in any group were so foolhardy as to claim personal invulnerability, and the groups do not differ in this respect. However, there are very substantial differences among the groups in whether they simply disagree or disagree strongly. Blacks are much more likely to reject the idea of personal invulnerability emphatically, while Mexican Americans are much less likely to do so, with White Anglos taking an intermediate position. The fact that the idea of personal invul-

nerability to earthquake injury is not inconceivable to most Mexican Americans seems consistent with the finding that distinctively more Mexican Americans are convinced that if they make earthquake preparations, those preparations will be successful. Mexican Americans do seem to be strongest in the conviction that the individual can do something that will reduce the personal hazard from earthquakes. Blacks seem to be more fatalistic both in a general sense and in this specific sense.

Orientation toward science. Interpretation and response to an earthquake warning may depend to an unusual degree upon the appreciation of science. With most other kinds of imminent natural disaster it is possible to find personally observable signs to confirm a scientifically-based warning. Rain lends credibility to a flood warning; telltale clouds and winds confirm the tornado or hurricane warning. Except when earthquakes are preceded by perceptible foreshocks, there do not seem to be comparable signs in case of earthquakes. Hence the response must be based exclusively on the scientifically based prediction.

Six items were assembled as an inventory of favorable and unfavorable views of science. Respondents indicated their extent of agreement or disagreement with each item. Scores were summed to constitute a comprehensive index of favorability toward science. White Anglos as a whole were clearly more favorable toward science than Blacks and Mexican Americans (Table 15). Blacks and Mexican Americans had similar median scores, but Blacks were more dispersed toward the positive and negative extremes than Mexican Americans. This is a pattern of Black heterogeneity that we have seen before. The relatively less favorable views of most Blacks toward science are partially offset by the highly favorable views of a substantial minority of Blacks.

TABLE 15

ORIENTATIONS TOWARD SCIENCE BY ETHNICITY

Orientation toward science	Black	Mexican American	White Anglo
Favorability toward science			
Least favorable	35.2	33.7	19.2
Less favorable	19.9	24.6	14.6
More favorable	30.9	35.8	43.8
Most favorable	14.0	5.9	22.4
Total	100.0	100.0	100.0
Causes of earthquakes			
Naturally occurring physical	40.1	48.4	61.9
Human action physical	17.7	19.2	18.5
Naturally occurring nonphysical	3.4	1.1	1.6
Human action nonphysical	4.1	2.6	1.7
No idea	34.7	28.7	16.3
Total	100.0	100.0	100.0
Belief in scientific prediction			
Low belief	34.2	21.8	18.3
Low medium belief	14.2	19.7	29.1
High medium belief	25.6	25.5	26.5
High belief	26.0	33.0	26.1
Total	100.0	100.0	100.0
Scientific prediction now			
Not at all accurately	24.2	16.0	18.0
Not too accurately	28.7	30.8	40.8
Don't know	3.4	3.2	1.3
Somewhat accurately	38.9	43.1	34.9
Quite accurately	4.8	6.9	6.0
Total	100.0	100.0	100.0
Scientific prediction in future			
Not at all accurately	11.6	4.3	3.1
Not too accurately	15.1	9.6	7.3
Don't know	5.1	6.9	2.0
Somewhat accurately	34.3	38.3	44.5
Quite accurately	29.1	34.0	38.1
(Quite accurately now)	4.8	6.9	5.0
Total	100.0	100.0	100.0

A more fundamental question than favorability toward science is whether people think about earthquakes in a frame of reference that is relatively compatible or incompatible with the scientific frame of reference. It would be unreasonable to expect to find a sophisticated scientific perspective on natural events in general use by the populace. But it is useful to know how many people meet a less exacting standard of compatibility with the scientific frame of reference. The question is whether people explain the occurrence of earthquakes by referring to physical processes and mechanisms, or whether they give mystical, teleological, moralistic, religious, or other nonphysical explanations. In order to answer this question, we asked respondents if they had any idea why earthquakes occurred. If they answered positively, they were asked to give their own explanations for earthquakes. They were encouraged to give several answers, and then asked whether anything that people do increases the likelihood of an earthquake. The answers were classified as citing physical or nonphysical causes, and as involving human action or not. Anyone who gave one or more nonphysical explanations was classified under this heading, and anyone who answered with one or more instances of human action precipitating an earthquake was classified in this category. Thus, respondents classified as citing physical causes had given exclusively physical causes, and respondents classified as seeing earthquakes as naturally occurring events mentioned no instance of human action precipitating or facilitating an earthquake.

The groups differ initially in the numbers who say they have any idea why earthquakes occur (Table 15). More than twice as many Blacks as White Anglos say they have no idea why earthquakes occur. Mexican Americans are intermediate, but much closer to the Blacks than to the White Anglos. If we look only at those who have some ideas about the causes of earthquakes, the

overwhelming majority in all groups cite physical causes. Although the number who cite nonphysical causes is small in all groups, nearly three times as many Blacks as White Anglos give nonphysical causes, with Mexican Americans closer to White Anglos than to Blacks. Blacks are also a little more likely to mention human action, with Mexican Americans again in an intermediate position.

Attitudes toward science find their most direct application to our current interest in the confidence that people place in scientific earthquake prediction. Respondents were asked, first, how accurately they thought scientists could predict earthquakes at present, and then, how accurately they would be able to predict earthquakes in the future. Answers to the two questions were combined to provide a general measure of belief in scientific earthquake prediction. As the figures in Table 15 indicate, there is little if any difference among the groups in the proportions who are generally positive and generally negative about earthquake prediction. A few more Mexican Americans than either Blacks or White Anglos are quite positive. But there are substantial differences among those who are generally skeptical. Substantially more Blacks are strongly skeptical about scientific prediction, as compared to both Mexican Americans and White Anglos.

Since a high level of confidence in earthquake prediction, especially at the present time, may indicate naivete about science, it should be helpful to look at the two questions that make up the general index. At the time of the interview, most earthquake scientists would have found it unrealistic to say that scientists could predict earthquakes either quite or somewhat accurately. By this criterion, 50.0 percent of Mexican Americans place unrealistic confidence in earthquake prediction, 43.7 percent of Blacks, and 40.9 percent of White Anglos. The skepticism of Blacks is expressed in the

larger number who say that scientists can't predict earthquakes at all accurately now. In the assessment of the current state of earthquake prediction, then, the generally positive attitude of White Anglos toward science is coupled with reasonable skepticism, while the less favorable attitudes of Blacks and Mexican Americans do not prevent an unrealistic overestimate of the current state of earthquake prediction.

Belief in the future prospects for earthquake prediction, on the other hand, is in accordance with attitudes toward science. The majority in all groups express considerable faith in the eventual accomplishments of scientific earthquake prediction. But White Anglos express substantially the highest rate of confidence and Blacks the lowest rate of confidence.

Belief in nonscientific earthquake forecasting. Many people besides scientists have long been forecasting earthquakes. Widely publicized psychics, astrologers, and amateur scientists have ventured forecasts. To what extent do the ethnic groups differ in the credibility they assign to forecasts from nonscientific sources? In answering a simple question, whether there are people besides scientists who can predict earthquakes, the three groups do not differ significantly. From 30 to 32 percent of each group answer positively. When respondents who answered positively were asked to name the people who can forecast earthquakes, fortune tellers (including astrologers, sooth sayers, psychics, and mystics) were most often mentioned. Here again, the groups did not differ, from 19 to 22 percent of each group naming this type of forecaster. While the number mentioning religious leaders was small, the differences among the groups were highly significant. Religious leaders were mentioned by 9.3 percent of Blacks, 6.4 percent of Mexican Americans, and only 1.7 percent of White Anglos. These differences parallel differences in the importance of religion already discussed (Table 16).

Of more interest is the question of whether there are signs that people can use in their daily life to tell whether an earthquake is coming. With

this series of questions we turn to "personal knowledge," in contrast to knowledge that comes from experts and authorities. Unusual animal behavior is the most widely heralded sign, having a long tradition in folklore (McWilliams, 1933) and given a considerable amount of credibility by scientists in recent years. Mexican Americans and White Anglos are quite similar in their acceptance of animal behavior as a premonitory sign (Table 16). But Blacks are a great deal more skeptical. More than half of the Blacks and Mexican Americans believe in earthquake weather, but here it is the White Anglos who are very much more skeptical. Like animal behavior, earthquake weather has a long history as a folk belief in California, but unlike animal behavior it has not been dignified by recent scientific attention nor named as one of the keys to the successful prediction of earthquakes by the Chinese. If Mexican Americans are "believers" in forecasting of all kinds, Blacks are more responsive to folk belief than to scientific attention, while White Anglos pay more attention to scientific endorsement than folk knowledge. It is also possible that fewer Blacks are accustomed to romanticizing and personalizing animals, as White Anglos and Mexican Americans are wont to do. Although few people in any of the groups acknowledge unusual aches and pains as an earthquake sign, the differences among the groups are similar to those for earthquake weather.

Premonitions, instincts, and ESP gain quite similar levels of support among the three groups. A significant pattern of intergroup difference develops, however, because White Anglos are a little more likely to be skeptical than Mexican Americans and Blacks, and more Blacks are undecided. As the most personal way of knowing, premonitions apparently tap a core belief whose distribution is more nearly uniform among the three ethnic groups.

TABLE 16

FORETELLING EARTHQUAKES BY ETHNICITY

Earthquake belief	Blacks	Mexican American	White Anglo
Signs in Daily Life:			
Unusual animal behavior			
Yes	48.1	67.0	70.6
Don't know	9.5	10.6	6.1
No	42.4	22.4	23.3
Total	100.0	100.0	100.0
Unusual weather			
Yes	55.2	58.8	35.9
Don't know	7.8	8.0	9.1
No	37.0	33.2	55.0
Total	100.0	100.0	100.0
Premonitions, Instincts, ESP			
Yes	39.0	43.3	37.4
Don't know	12.7	8.0	5.9
No	48.3	48.7	56.7
Total	100.0	100.0	100.0
Unusual aches or pains			
Yes	11.6	11.2	5.8
Don't know	8.4	10.2	5.3
No	80.0	78.6	88.9
Total	100.0	100.0	100.0
Prediction belief pattern			
Believer	53.7	60.7	54.5
Strictly scientific	14.3	18.6	33.2
Antiscientific	18.7	15.4	8.7
Skeptic	13.3	5.3	3.6
Total	100.0	100.0	100.0

We have found it useful to assemble the information about acceptance of scientific prediction, forecasting by nonscientists, and signs that people can use in their daily life into a master typology. This has been facilitated by the early discovery that the ways of predicting or forecasting earthquakes approximate the model of a Guttman scale, with nearly everyone accepting scientific prediction, and people distinguished chiefly by how many other grounds they accept besides scientific. The prediction belief typology distinguishes believers, who accept both scientific and at least one form of nonscientific forecasting, the strictly scientific who accept only scientific prediction, the skeptics who accept no grounds for prediction, and the antiscientific who accept at least one form of nonscientific forecasting but do not think scientists will eventually predict earthquakes fairly accurately. In distinguishing between the believers and the strictly scientific, we have not treated unusual animal behavior as an unscientific ground for prediction, since it has undoubtedly gained in credibility because of the scientific attention it has received.

The majority in all groups are believers, accepting both scientific and nonscientific forecasting. A few more Mexican Americans than either Blacks or White Anglos fall into this category. White Anglos stand apart in the considerably larger number who credit only scientific prediction. Mexican Americans and Blacks are not very different in this respect. Blacks stand out from the other two groups for the considerably larger minority of skeptics. Blacks and Mexican Americans both include more who are antiscientific than the White Anglo sample. Looking at the three groups separately, the Black sample includes more people who are skeptical of all prediction and especially of scientific prediction; the Mexican American sample includes more who accept nonscientific grounds for forecasting earthquakes; and the White Anglo sample

includes substantially more who accept exclusively scientific grounds for earthquake prediction.

Trust

Trust in officials and scientists. Trust in responsible officials and scientists and in one's fellow citizens is another cluster of orientations that will very likely affect the interpretation and response to notices and warnings of impending earthquakes. The suspicion is often expressed, with respect to a wide range of matters of public importance, including earthquake prospects, that authorities know much more than they are telling the public. Rumors that circulated during the year after announcement of the southern California Uplift often included the assertion that scientists or officials were withholding a well-documented prediction for fear that the public couldn't take the news.

We asked respondents whether they thought scientists and public officials were giving us all the information they have on predictions, or holding back information. Only a minority were confident that they were being told everything (Table 17). White Anglos and Mexican Americans more often expressed confidence that they were being told all than Blacks, who were suspicious in this respect as in many others. Scientists garnered a little more trust than public officials, and Blacks were especially likely to distinguish between officials and scientists in the latter's favor. A follow-up question asking why public officials and scientists were holding back information revealed no clear difference among the groups in whether they attributed concealment to concern for the people's welfare or protection of self-interest.

When the judgments about officials and scientists are disentangled, and the reasons for withholding information are merged with answers to the first

TABLE 17

IS THE PUBLIC BEING TOLD? BY ETHNICITY

Information withheld?	Black	Mexican American	White Anglo
Are scientists and public officials holding back information?			
Both are giving all they have	26.8	39.4	43.1
Only scientists are giving all	9.6	4.8	4.8
Only public officials are giving all	1.7	2.7	2.4
Both are holding back information	51.2	40.9	41.4
Don't know	10.7	12.2	8.3
Total	100.0	100.0	100.0
Are public officials holding back information?			
Giving all they have	28.1	42.0	45.5
Holding back for people's welfare	28.8	22.4	20.7
Holding back for own interests	31.8	23.4	25.5
Don't know	11.3	12.2	8.3
Total	100.0	100.0	100.0
Are scientists holding back information?			
Giving all they have	36.1	44.2	47.9
Holding back for people's welfare	24.5	21.8	19.8
Holding back for own interests	28.1	21.8	24.0
Don't know	11.3	12.2	8.3
Total	100.0	100.0	100.0

question, we can compare the trust in public officials and scientists. The two sets of figures are rather similar for Mexican Americans and White Anglos. Among Blacks, the lower confidence in officials than in scientists remains. The intergroup differences are largely in the view of whether information was being withheld and not in the motives attributed to account for the withholding.

Summary

The Black sample. Blacks in our sample tend to be younger than White Anglos, though slightly older than Mexican Americans. More Blacks than either Mexican Americans or White Anglos apparently delay marriage, though the marriage rates among older people are quite similar for the three groups. More Blacks live in one-person households, and this is especially true for men. In spite of this, more Blacks than White Anglos share households with school children. And under the age of 26, more Blacks than either White Anglos or Mexican Americans live in households with school children. Among Blacks there are more households with children and either just one adult who is female, or with two or more adults of whom the household "head" is female. In more of the Black households there is no one who is employed full or part time. Unemployed and underemployed males living alone and single females living with children account mostly for this difference between Blacks and the other groups.

Socioeconomically, Blacks and Mexican Americans are strongly disadvantaged compared to White Anglos. But the household income of Blacks reveals a bimodal distribution, with the principal mode in the lower income brackets and a lesser mode in the upper brackets. From time to time we shall see other indications that a substantial minority of Blacks have moved away from the prevailing Black patterns and approached White Anglo norms. Blacks have

had considerably more formal schooling than Mexican Americans. The proportion who have graduated from high school is only a little less than for White Anglos, but the difference quickly becomes greater at levels above high school. The socioeconomic ratings of their occupations place Blacks between the White Anglos and Mexican Americans.

The relationship of Blacks to the community is complex. Fewer Blacks than Mexican Americans are recent migrants to southern California, and fewer Blacks than either Mexican Americans or White Anglos are long-time residents. Home ownership is low, more Blacks than either of the other groups expect to move from their present residences within five years, fewer Blacks than Mexican Americans read their ethnic paper, and fewer Blacks than either Mexican Americans or White Anglos read a community newspaper. On the other hand, Blacks are no different in the proportion who regard the community where they live as their real home, and nearly as many Blacks as White Anglos read the Los Angeles Times and nearly as many Blacks as Mexican Americans read the Herald Examiner. If extended family network and organizational membership represent two styles of outreach into the community, Blacks are more heterogeneous in style of outreach than the other groups.

In the realm of values the near unanimity among Blacks on the great importance of religion in their lives sets them apart from the other groups. The majority identify themselves with one Protestant denomination, the Baptist church, and a minority favor the Pentacostal and Holiness churches. Blacks are like Mexican Americans in ranking unemployment and cost of living higher as problems facing southern Californians than White Anglos do, though all agree in ranking crime first. They differ from Mexican Americans only in ranking unemployment ahead of cost of living, which appears consistent with household unemployment patterns.

Blacks are intermediate between White Anglos and Mexican Americans in the extent of experience with earthquakes and close to White Anglos in experience with other natural disasters. But more of the Blacks who have experienced earthquakes say they were very frightened at the time. While nearly everyone denies personal invulnerability to earthquakes, more Blacks are emphatic in the denial. And more Blacks express highly fatalistic attitudes toward the effects of earthquakes. In the same vein, more Blacks are skeptical about scientific earthquake prediction both now and in the future, and Blacks are also more skeptical about unusual animal behavior as an earthquake precursor. In contrast, considerably more Blacks than White Anglos believe in earthquake weather as a precursory sign. More Blacks than either Mexican Americans or White Anglos say they have no idea why earthquakes occur. These observations form a mostly consistent picture of a particularly large segment of the Black community who feel impotent and uncomprehending in the face of the earthquake threat.

The Black distribution is again bimodal on attitude toward science. Blacks include their share of staunch supporters, but more than their share with antiscientific views. The small minority who credit religious leaders with the ability to predict earthquakes is much larger among Blacks than among the other groups, and the minority who place more trust in nonscientific than scientific grounds for earthquake forecasting is larger than it is among White Anglos. Fewest Blacks explain earthquakes on the basis of naturally occurring physical causes, and though the absolute proportions are small, more Blacks give nonphysical causes.

Finally, Blacks are more suspicious than Mexican Americans or White Anglos that scientists and public officials are holding back information from the public, and the suspicion is especially directed toward officials.

The Mexican American sample. The Mexican Americans are the youngest of the three groups, but they include the largest proportion who are married. The difference in marriage rates persists when age is controlled, and is especially marked in the youngest age bracket, indicating a pattern of early marriage. More Mexican Americans live in large households and fewer males live alone. More young and middle-aged Mexican Americans live in households with school children. More of the household heads are identified as males, and fewer households are without a wage earner. Altogether, more Mexican Americans than either Blacks or White Anglos live in a traditional family with only one principal wage earner who is the male identified as head of the houshold. The pattern is apparently for males to wait until they have found full-time employment to establish independent households.

Mexican Americans are lowest in average educational attainment and the majority are not high school graduates. They are also lowest in the socio-economic status of the occupations they hold. The differential in income between Mexican Americans and Blacks is not so great as might have been expected from education and occupational status. In total household income Mexican Americans are more concentrated in the middle income range. In income adequacy (adjusted for household composition) they are not very different from Blacks, except that there are fewer in the high income bracket and more in the low medium category. In general, fewer Mexican Americans than Blacks have "made it" socioeconomically, but the great majority have done as well as Blacks in spite of low education and low occupational status. More Mexican Americans than either Blacks or White Anglos are recent migrants to the area, though more Mexican Americans than Blacks are long-time residents. Compared with both other groups, Mexican Americans are least involved in social, religious, and political groups within a three-mile radius of their

homes, but most often have relatives living nearby. In a substantial proportion of households Spanish is the principal language spoken and a significant minority, mostly from this latter group, read the area's Spanish-language newspaper. In spite of this fact, more Mexican Americans than Blacks read an English-language community newspaper. Like the other groups, most Mexican Americans view where they live as their real home. The conclusion seems warranted that when allowance is made for some divided loyalty related in part to national background but primarily to language differences, Mexican Americans are no less committed to their local communities than White Anglos. However, the style of outreach into the community is distinctly different. Instead of using organizational memberships, Mexican Americans reach out into the community through extended family networks.

Mexican Americans are overwhelmingly Catholic, and are more disposed than White Anglos to feel that religion is very important in their lives. Like White Anglos they rank crime and cost of living the most serious problems facing southern Californians, but differ in placing unemployment third.

Fewest Mexican Americans have had prior experience with earthquakes, have suffered damage or injury from an earthquake or have a friend or relative who has, or have experienced other natural disasters. Those who have experienced earthquakes fall between Blacks and White Anglos in how frightened they felt during the quake. Fewer Mexican Americans than Blacks are fatalists about earthquakes, and possibly fewer even than among White Anglos. While most Mexican Americans reject the idea of personal invulnerability to earthquakes, they are less emphatic in rejecting the idea than either Blacks or White Anglos. More Mexican Americans than either Blacks or White Anglos believe that scientists can predict earthquakes now. They equal White Anglos in the high acceptance of unusual animal behavior as an earthquake sign, and they equal Blacks in acceptance

of the idea of earthquake weather. More Mexican Americans than White Anglos, though less than Blacks, have no idea why earthquakes occur. In general, Mexican Americans provide a sharp contrast to Blacks in being less fatalistic about earthquakes and more disposed to believe that earthquakes can be forecast in a variety of ways. Indeed there may be an unwarranted sense of security and controllability concerning earthquakes among a substantial proportion of Mexican Americans, based on a naive faith in the capability of both science and nonscience to forecast earthquakes.

Mexican Americans are less favorable toward science than White Anglos. In spite of the substantial minority who think scientific earthquake prediction is here now, fewer Mexican Americans than White Anglos (but more than Blacks) believe in eventual scientific prediction capability. Fewer Mexican Americans than White Anglos explain earthquakes strictly by naturally occurring physical causes and more explain them in nonphysical terms involving human intervention, though they are less extreme than Blacks in this respect. They also more often accept nonscientific grounds for earthquake forecasting. If Blacks are disproportionately represented in the skeptic prediction belief pattern, Mexican Americans are disproportionately represented in the believer pattern, tending to combine faith in both scientific and nonscientific forecasting.

Mexican Americans are like White Anglos rather than Blacks in the extent to which they suspect officials and scientists of holding back information about coming earthquakes. Nor do they distinguish between officials and scientists as sharply as Blacks. There is no indication that Mexican Americans are less trusting of public officials than White Anglos.

White Anglos. Although we are interested in White Anglos primarily as a control group, a brief summary may help to highlight distinctive features of the two minority groups. White Anglos include the most respondents over

fifty years of age, the most living in households without children, and the fewest young and middle-aged persons living in households with school children. More White Anglo females live alone, especially among the retired, and more view the term "household head" as inapplicable to their situation. Among White Anglos there are more two-wage-earner multiple adult households without children, and fewer multiple adult households including children without a regular wage earner. By all indexes the average socioeconomic status of White Anglos is highest. They average the longest residence and express the least intention to move within five years. They are most involved in community outreach through membership in organizations and least through having relatives living nearby. They are most likely to read both a metropolitan and a community newspaper regularly.

Although the great majority find religion quite important in their lives, more White Anglos than either Blacks or Mexican Americans say that religion is not very important to them. In religious identification White Anglos are more heterogeneous than the minority groups, being divided between a Protestant majority and a substantial Catholic minority. As compared with Blacks, the White Anglo Protestants are more heavily concentrated in the more established denominations. White Anglos agree less among themselves about the major problems facing southern Californians. They name crime and the cost of living first and second, but differ from the minority groups in placing resource scarcity, taxes, and smog and pollution next. Compared to their strong belief in the ultimate development of scientific prediction capability, White Anglos are realistically skeptical about current prediction capability, though less so about animal behavior as an earthquake sign. White Anglos are generally most favorable toward science, most likely to explain earthquakes strictly by naturally occurring physical causes, and most likely to fall into the <u>strictly</u> <u>scientific</u> prediction belief pattern.

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CHAPTER FIVE

COMMUNICATION, AWARENESS, AND ACTION

Communication

Learning about the earthquake hazard and what to do about it depends upon being exposed to communication of various kinds. The media and interpersonal communication networks probably serve quite different and often complementary functions in communicating information and helping people to make up their own minds. Specific media are different, with radio and television favoring timeliness and brevity, newspapers being slightly less timely but offering treatments in greater depth, and magazines and books leaning even more to treatments in depth and sometimes catering more than the other media to quite specialized audiences. The extent and range of communication channels used and the choice among channels may have significant effects on the awareness and response to earthquake developments.

Media sources. We have already (Chapter Four , Table 9) considered newspaper readership patterns. White Anglos and Blacks read the main metropolitan dailies--especially the Los Angeles Times--in greater proportions than Mexican Americans. The second-ranking metropolitan daily, the Herald Examiner, appeals more to Blacks and Mexican Americans than it does to White Anglos. White Anglos are much more likely to read a community paper, usually in addition to a metropolitan daily, than either minority group. Especially few Blacks read a community paper. About one in five Mexican Americans reads the Spanish

language paper, which gives expanded coverage to earthquakes in Latin America but slights events and hazards in southern California. Relatively few Blacks read the principal Black newspaper, which usually ignores earthquake matters entirely.

One may use a certain communication medium without necessarily getting earthquake information from that source. Respondents were asked:

> During the past year, have you heard about earthquakes or earthquake predictions or earthquake preparedness from <u>any</u> of the following sources?

Respondents could answer "yes" to as many of the items as they chose. The answers can be used to compare both the range of media sources employed and the relative usage of specific media.

First we consider the range of media from which earthquake information was received. The seven media included in the question were radio, television, newspapers, magazines, books, pamphlets in the mail and movies (either fictional or documentary). Respondents were also asked if there were any other source, but so few answered positively that we have disregarded these responses. White Anglos received earthquake information from the widest range of sources and Blacks from the narrowest (Table 1). As in some earlier tabulations the Black distribution is bimodal, with the generally narrow usage offset by use of four or more media by a proportion equal to that of White Anglos.

The most extensive differences in the use of specific media distinguish White Anglos equally from Blacks and Mexican Americans. The use of newspapers sets White Anglos apart most strongly, followed by the use of magazines, and by television news and television specials. Except for television news, these are all sources that favor treatments in depth. Mexican Americans and White Anglos are alike in using radio as a source of earthquake information more often than Blacks. And Mexican Americans stand out from both Blacks and

TABLE 1

MEDIA SOURCES OF EARTHQUAKE INFORMATION BY ETHNICITY

Media source	Black	Mexican American	White Anglo
Number of media sources:			
None	8.2	2.1	1.5
One	34.2	31.4	18.7
Two	13.0	21.3	23.3
Three	12.9	18.6	25.3
Four to seven	31.7	26.6	31.2
Total	100.0	100.0	100.0
Specific media sources:			
Radio	63.7	72.9	74.7
Television news	82.3	83.0	90.0
Television commercials	17.4	18.6	16.4
Newspapers	62.2	59.6	83.1
Magazines	33.3	31.9	45.9
Books	21.4	16.0	17.3
Pamphlets in the mail	12.3	13.3	11.3
Movies	39.5	56.4	47.8
Chief source of information about prediction announcements:			
Television	66.9	56.2	52.8
Radio	12.1	16.4	11.4
Newspapers	9.6	13.9	22.5
Books and magazines	1.4	0.5	2.4
Family members and relatives	1.7	2.5	3.0
Friends, neighbors and coworkers	5.9	9.0	6.6
Other	2.4	1.5	1.3
Total	100.0	100.0	100.0

White Anglos in learning about earthquakes from movies. If we assume that most of these references were to the motion picture Earthquake, which was current at that time, more Mexican Americans have "learned" from rather sensational and graphic depiction of earthquakes in this motion picture and in the vivid newspaper accounts of the Guatemala disaster. Blacks have generally used all of the media less, except for the three lowest frequency sources on which the groups do not differ significantly.

In a separate sequence of questions we attempted to ascertain each respondent's chief source of information about predictions and forecasts of earthquakes. By a question technique that will be described when we discuss earthquake awareness, respondents were asked to identify any predictions or public statements about future earthquakes they had heard. For each of these announcements, respondents were asked: "Do you remember what your chief source of information about this prediction was?" People who did not remember any announcement were not asked this question at all. People who remembered more than one announcement were asked the question more than once. Percentages reported in the bottom portion of Table 1 are based on the number of times the question was asked for each ethnic group rather than the number of persons. The question evoked some answers giving interpersonal rather than media sources.

The groups are alike in ranking television far ahead of all other sources combined. However, Blacks stand out in their dedication to television. Blacks and Mexican Americans are alike in ranking radio and newspapers second and third, respectively. Radio seems to play a slightly more important role among Mexican Americans, which may be explained by the existence of stations that broadcast in Spanish. The greatest relative difference between the minority groups and White Anglos is in the use of newspapers. Newspapers rank second to television for White Anglos, with twice the attention of radio.

Newspapers, generally the source of news treatments in greater depth than television or radio can provide, are strikingly seldom mentioned by Blacks. A small minority in each group cite interpersonal rather than media sources. Differences are too small to merit serious attention. It is worth noting, however, that in spite of the more comprehensive embedding of Mexican Americans in nuclear extended families, they do not name family and relatives as the chief source for prediction information any more often than White Anglos. They do mention friends, neighbors, and coworkers more often than Blacks or White Anglos. These observations are consistent with the interpretation offered in the preceding chapter, that the strong Mexican American family system serves as a linkage rather then a barrier to the community.

Attendance at group meetings on the subject of earthquake safety and preparedness is another way of securing information. Less than 20 percent of the entire sample have attended one or more such meetings, and the rates do not differ significantly among the three ethnic groups.

Informal discussions. Complementary to the relatively formal sources consisting of the mass media and group meetings is informal discussion of earthquake topics. Respondents were first asked whether, "within the last year, you have talked with anyone about the possibility of an earthquake happening in southern California." Answers reveal the same pattern as the use of media sources, with the largest proportion of White Anglos and the smallest proportion of Blacks saying they have discussed the earthquake possibility with someone (Table 2).

Respondents who said they had discussed the earthquake possibility with anyone were then asked with whom they had discussed the subject. This question was open-ended, with no answers suggested to the respondents. Answers were classified as follows: adults in the household other than children, children in household eighteen years and over, children in household seventeen years and under, other relatives not in household, coworkers, friends and neighbors,

TABLE 2

DISCUSSION OF EARTHQUAKE TOPICS BY ETHNICITY

Discussion	Black	Mexican American	White Anglo
Talked about earthquake possibility	55.7	64.9	77.8
Range of earthquake topics discussed:			
One or two topics	40.1	23.8	23.7
Three or four topics	35.0	40.1	42.3
Five to eight topics	24.9	36.1	34.0
Total	100.0	100.0	100.0
Range of discussion partners:			
1 - 33 percent	53.4	30.3	39.1
34-57 percent	23.9	30.3	28.4
58 - 100 percent	22.7	39.4	32.5
Total	100.0	100.0	100.0

and others. Respondents were then handed a card listing the following specific topics for discussion: predictions, family preparedness, why earthquakes occur, quakes around the world, old unsafe or pre-1933 buildings, dams and flooding, and other. Respondents were then asked which of the topics had been discussed with each of the types of discussion partner previously mentioned. Topics not classifiable under one of the seven specific categories were mentioned too infrequently to warrant separate treatment. Among only those respondents who had discussed the earthquake prospect with someone, Mexican Americans and White Anglos had similar ranges of discussion topics, while Blacks tended to discuss fewer topics (Table 2).

A complex index was constructed to identify the range of discussion partners. Again, answers to the open-ended question were coded as adults in the household, children 18 years old and over in the household, children under 18 years old in the household, other relatives not in the household, coworkers, and friends and neighbors. However, the possibility of a respondents's talking with specific types of partners depends on household composition and employment status. For example, while everyone could presumably talk with friends and neighbors and relatives outside of the household, only people who were working full or part time would have coworkers to talk with and only respondents with minor children in the household could have them as partners. Accordingly, each person's absolute number of types of discussion partners was stated as a proportion of possible discussion partners, based on household composition and work status. The resulting index shows that when they discuss earthquake topics at all, Mexican Americans are likely to discuss them with the widest range of types of partners available to them, while Blacks are most likely to restrict their discussion to a narrow range of partners.

On the basis of these three questions the picture for Blacks is consistent. Fewest Blacks discuss the earthquake prospect, and among those who do enter into such discussion the range of partners and the range of topics

is narrowest. The comparison between Mexican Americans and White Anglos reveals more patterned differences. Fewer Mexican Americans than White Anglos have discussed the earthquake prospect, but among those who have had such discussions, the range of topics is similar and the range of partners is wider. Again, the Mexican family system does not supplant the community as a medium for informal communication.

A more detailed examination of discussion topics and partners is reported in Table 3. The general pattern that White Anglos have been most involved in discussion and Blacks least involved applies to each of the seven topics, except that more Mexican Americans have discussed family preparedness. The two most common topics for discussion in all groups are predictions and earthquakes around the world. "Why we have earthquakes" comes third for Blacks and White Anglos, but family preparedness comes third for Mexican Americans. Relative to their generally lower rate of discussion for all topics, Blacks talk more than would be expected about old unsafe buildings. This finding may be a consequence of efforts by Los Angeles City Councilman Gilbert Lindsay to identify the Building and Safety Committee's proposals to deal with unsafe pre-1934 buildings as a racist attack on the Black community, or simply the fact that many of these buildings are located in areas of Black concentration. White Anglos talk relatively less about "moving out" and more about dams and flooding than either minority group.

The rank order of discussion partners is fairly similar for the three groups. Friends and neighbors come first, adults in the household second, and relatives next. Coworkers and children in the household follow. However, reflecting their more extensive involvement in family units, Mexican Americans center relatively more discussion within the family.

A further tabulation of topics with partners was examined in order to

TABLE 3

RANGE OF EARTHQUAKE DISCUSSION BY ETHNICITY

Partners and topics	Blacks	Mexican American	White Anglo
Discussion partners for possibility of an earthquake happening:			
Household adults	18.2	41.0	36.4
Children over 17 years	0.7	5.3	2.9
Children under 18 years	9.9	15.4	12.5
Relatives not in household	18.8	33.5	29.5
Coworkers	13.4	25.0	27.9
Friends and neighbors	40.8	45.7	52.2
Others	1.0	3.7	3.7
Specific topics discussed:			
Predictions	39.4	55.3	66.0
Family preparedness	21.2	38.3	36.6
Why earthquakes occur	26.4	32.4	39.0
Quakes around the world	32.2	42.6	51.1
Unsafe or pre-1934 buildings	25.0	25.5	33.3
Dams and flooding	9.6	17.6	27.0
Moving out	17.5	20.2	21.2
Discussion partners, adjusted for availability:			
Household adults	32.7	51.7	57.3
Children over 17 years	9.1	50.0	37.3
Children under 18 years	18.2	23.4	36.8
Relatives (not adjusted)	18.8	33.5	29.5
Coworkers	23.4	40.9	44.9
Friends, neighbors (not adjusted)	40.8	45.7	52.2

determine whether different groups used different partners for different topics. If we compare the rank order of partners for each topic we find that the general pattern just described remains generally applicable (Table 4). However, there is some systematic difference in the relative use of friends and neighbors as compared with the use of household adults. Friends and neighbors come first for all topics among Blacks. They come first for all topics except family preparedness among White Anglos. But household adults come first in discussing family preparedness, unsafe buildings, dams and flooding, and moving out among Mexican Americans. The more impersonal topics of predictions, why we have earthquakes, and earthquakes around the world are more often discussed with friends and neighbors among all groups.

It should be remembered that the foregoing observations are not adjusted for the presence of other adults and children in the family or for work status, but indicate simply the contribution that each type of discussion makes to earthquake communication in each of the three ethnic and racial groups. The last set of entries in Table 3 incorporates these adjustments. The adjusted percentages indicate the extent to which partners are used <u>when available</u>. For example, percentages in the first row now show many of the respondents who share households with one or more other adults have discussed the possibility of an earthquake happening with those adults.

The rank order of partners is now changed for both Mexican Americans and White Anglos. Respondents from these two groups who live in households with other adults most often discuss the earthquake prospect with adults in their own households. Friends and neighbors now rank second as discussion partners. Friends and neighbors still rank first for Blacks, however. The strikingly different rates for discussion with children eighteen years of age and over should not be emphasized because of the small base frequencies. However, the rates are consistent with the interpretation that Mexican Americans treat older

TABLE 4

DISCUSSION TOPICS AND PARTNERS BY ETHNICITY

Ethnic group and earthquake topic	Household adults	Children < 17 years	Children ≥ 18 years	Relatives	Coworkers	Friends and neighbors
Blacks:						
Predictions	13.7	0.3	6.2	12.0	12.0	29.5
Family preparedness	8.2	0.3	5.8	7.9	3.4	12.3
Why earthquakes	8.2	0.3	4.5	6.5	5.5	18.2
Earthquakes	11.6	0	4.8	11.3	7.2	23.3
Unsafe buildings	7.2	0	3.4	6.8	6.8	17.8
Dams and flooding	2.4	0	0.7	2.7	1.4	7.5
Moving out	1.7	0	2.1	4.5	2.7	12.3
Mexican Americans:						
Predictions	35.1	4.3	9.6	24.5	22.3	35.6
Family preparedness	24.5	3.2	12.2	14.4	8.5	16.0
Why earthquakes	17.0	2.7	5.3	17.0	14.4	18.6
Earthquakes	25.5	1.6	4.8	20.2	15.4	27.7
Unsafe buildings	14.9	1.1	1.6	9.0	8.0	10.6
Dams and flooding	8.5	1.6	2.1	7.4	6.4	8.0
Moving out	10.1	1.1	1.6	8.0	4.3	9.6
White Anglos:						
Predictions	30.4	2.4	8.6	23.7	24.4	44.6
Family preparedness	20.6	1.1	10.9	11.4	6.4	14.6
Why earthquakes	18.8	1.5	5.9	11.9	11.9	22.1
Earthquakes	26.6	1.9	6.5	16.9	16.4	30.3
Unsafe buildings	15.2	0.6	3.9	9.9	10.2	19.6
Dams and flooding	13.5	1.0	3.3	7.3	7.8	14.5
Moving out	6.9	0.2	1.3	5.5	6.8	12.3

children the same as adults in the household, that White Anglos treat older children the same as younger children in the household, and that older Black children are not part of the household so far as communication patterns are concerned.

We do not have the necessary information to make a satisfactory adjustment for available relatives. Assuming that nearly everyone has at least intermittent communication with one or more relatives outside of the immediate household, we have retained the unadjusted rates. However, relatively speaking, the Mexican American rate is undoubted inflated and the White Anglo rate depressed in light of the greater number of relatives in close proximity to Mexican American households.

The general pattern of slightly less frequent discussion with most kinds of partners among Mexican Americans than among White Anglos is broken in case of children seventeen years of age and under. The difference here is substantial, suggesting that the tendency either to shield the young from discussions of potentially anxiety-producing topics or to feel that the young have no contribution to make to family decision making on such topics is stronger among Mexican Americans than among White Anglos. The rate of discussing the earthquake prospect with young children is even lower for Blacks, but it is not disproportionately lower than it is for other partners except friends and neighbors.

We can summarize the analysis of adjusted discussion rates by observing that in addition to a consistent pattern for White Anglos to engage in discussion most frequently and Blacks least frequently, there are some differences in the choice among available partners. Blacks stand out for the more frequent discussion of the earthquake possibility with friends and neighbors rather than adults within the household, and for the minimal communication with older children still in the household. Mexican American stand out for the tendency to include older children with other household adults as the most frequent partners for discussion, but to protect younger children by excluding them from discussions of the possibility of an earthquake happening.

Studies of the influence of the mass media and of opinion formation through discussion have stressed the importance of intermediaries in the discussion

TABLE 5

ACCESS TO FOLK EXPERTS BY ETHNICITY

Access to folk expert	Black	Mexican American	White Anglo
Regards self as expert	1.4	1.6	2.7
Expert in circle of friends	10.7	12.8	17.0
No expert among friends	87.9	85.6	80.3
Total	100.0	100.0	100.0

process, often referred to as opinion leaders or folk experts. These individuals often sift and interpret media content for their associates, and they serve as leaders and resource persons in neighborhood and work group discussions. Anyone who hears an earthquake rumor from an unauthenticated source, or who hears a troublesome viewpoint advanced on television, is likely to consult the local folk expert for a credible opinion. The availability of folk experts should facilitate discussion and opinion formation on earthquake topics. Respondents were asked:

> Including yourself, is there anyone in your circle of friends who seems most knowledgeable about earthquakes or earthquake predictions?

The overwhelming majority of people in the three ethnic groups do not have anyone they regard as expert on earthquake topics in their circle of friends (Table 5). There are small differences among the groups that are marginally significant ($P < .05$). More White Anglos and fewest Blacks recognize a friend as being better informed on earthquakes. More White Anglos than either Blacks or Mexican Americans have themselves in mind when they identify a folk expert. Because they are slight, and because the overwhelming majority in all three groups are without local experts they can turn to, these differences should not be emphasized. They are consistent, however, with the general picture in which Blacks are least involved in communication about earthquake matters and White Anglos, with some exceptions, are most involved.

Combining media with informal discussion. Both the media and informal discussion have important parts to play in the earthquake communication process. Ideally we would like to distinguish between those people who rely exclusively on the media, those who get their information principally from informal sources, and those who use informal discussion to sift and extend what they receive from the media. The first group is easy to identify as those respondents who have learned about earthquakes from media sources but have not engaged in discussion of earthquake topics. The second and third groups are more difficult to distinguish. The number who rely exclusively on discussion is too small for separate analysis. But we can combine those few with all

respondents who mention family members, friends, coworkers, or other discussion partners as the chief source of information about one or more earthquake predictions, near predictions, or forecasts. The result of this sorting process is to separate those respondents who identify the media as the source of their information and use informal discussion to sift and extend their understanding from respondents who place greater than customary reliance on informal discussion as an authoritative source of information. The incidence of these three patterns in the three ethnic and racial groups is presented in Table 6.

The use of discussion to supplement and filter communications that are authoritatively attributed to the media characterizes the majority of respondents in each group. But the intergroup differences are considerable. About twice as many Blacks as White Anglos rely exclusively on the media without the benefit of discussion to filter and extend communications from this source. Mexican Americans are intermediate between Blacks and White Anglos. The pattern of disproportionate reliance on informal sources is infrequent in all groups, though it may be trivially larger among Mexican Americans.

Several important effects of discussion may be lacking among the many Blacks and fewer Mexican Americans and White Anglos who rely exclusively on the media. Discussion helps to imprint media content in memory. Discussion helps to convert information into terms that are relevant to one's personal situation. Discussion helps to bring realism to bear on unrealistic communications. Discussion stimulates interest. Discussion permits confirmation, correction, and completion of communications that are imperfectly heard or understood. And discussion alerts people to media communications that they have not personally heard or seen. We should expect to see these effects most frequently among Blacks and least frequently among White Anglos.

Disproportionate dependence on informal sources of information, on the other hand, should increase the individual's susceptibility to rumor. The three racial and ethnic groups should not differ importantly in this respect.

TABLE 6

RELIANCE ON MEDIA AND DISCUSSION BY ETHNICITY

Pattern of use	Black	Mexican American	White Anglo
Exclusive reliance on media	41.0	28.7	20.6
Discussion supplementing media	51.4	60.5	71.0
Disproportionate reliance on discussion	7.6	10.8	8.4
Total	100.0	100.0	100.0

Earthquake Hazard Awareness

Awareness of predictions and forecasts. Different amounts of exposure to communication about earthquakes should be reflected in different degrees of awareness of earthquake hazard. We anticipate that the minority groups and especially Blacks will have heard or remembered fewer of the predictions, near predictions, forecasts, and cautions about future earthquakes that were announced during the year prior to this survey. Respondents were asked whether, in the past year or so, they had heard any "predictions, statements, or warnings about earthquakes in the southern California area." Each separate announcement was identified and explored through detailed questioning.

The number of distinct announcements remembered was recorded for each respondent. As indicated in Table 7, one announcement was the modal number for each of the three groups. But the group differences are consistent with the difference in their exposure to earthquake communication. More White Anglos have heard two or three or more announcements, and more Blacks have heard none.

But most predictions and forecasts that people hear are not taken seriously. For each announcement respondents were asked, "How seriously do or did you take this prediction?" People who said "Quite seriously" or "Fairly seriously" were classified as taking the announcement seriously. As the table indicates, the majority in each group fail to take any of the announcements seriously, and very few take more than one seriously. Blacks, who remember fewer announcements, also take fewer seriously. But the comparison between Mexican Americans and White Anglos is now reversed. While Mexican Americans have heard or remembered fewer announcements than White Anglos, they are less skeptical about those they have heard. As a result, 43.8 percent of Mexican Americans have heard and taken seriously one or more predictive

TABLE 7

AWARENESS OF EARTHQUAKE PREDICTIONS, FORECASTS, AND CAUTIONS BY ETHNICITY

Awareness of announcements	Blacks	Mexican American	White Anglo
Number of announcements heard:			
None	20.6	10.1	12.6
One	60.9	68.6	54.6
Two	15.2	18.6	25.5
Three or more	3.3	2.7	7.3
Total	100.0	100.0	100.0
Announcements taken seriously:			
None	71.5	56.2	64.3
One	23.3	37.9	29.6
Two or more	5.2	5.9	6.1
Total	100.0	100.0	100.0
Kinds of announcements heard:			
Scientific	6.5	8.4	18.2
General	45.7	36.0	35.1
Pseudoscientific	36.5	44.9	36.0
Prophetic	7.2	5.1	6.6
Other	4.1	5.6	4.1
Total	100.0	100.0	100.0
Kinds of announcements taken seriously:			
Scientific	14.1	8.3	33.3
General	42.3	31.0	31.2
Pseudoscientific	32.1	45.2	28.1
Prophetic	5.1	7.2	3.3
Other	6.4	8.3	4.1
Total	100.0	100.0	100.0
Percent of announcements heard that are taken seriously:			
Scientific	57.9	38.9	54.5
General	23.7	33.8	26.1
Pseudoscientific	23.6	39.6	23.2
Prophetic	(19.0)	(54.5)	15.0
Other	(41.7)	(58.3)	29.4

or forecasting announcements, compared with 35.7 percent of White Americans and 28.5 percent of Blacks. One might say that there is more general awareness among White Anglos but more significant awareness among Mexican Americans. We shall be better able to interpret this comparison when we look at the kinds of announcements each group remembers.

The announcements that people reported were classified into four broad categories. Some of the announcements were traceable to scientific sources. Others were quite general in nature, so that they could not be traced to any specific source. Still others were pseudoscientific, meaning that they could be traced to sources that improperly represented themselves as scientific. Most of these replies referred to the prediction for an earthquake in the Los Angeles area on December 20, 1976, issued by Henry Minturn. Others referred to the belief that much of California would soon break off and slide into the Pacific Ocean in a great earthquake. Still others we call prophetic. Most of these were issued by secular mystics, seers, astrologers, and the like. A small proportion came from religious sources. A few that could not be placed in one of these categories, mostly because they combined categories, were labelled "other."

From 71 to 82 percent of the announcements heard and remembered in each of the groups were either general forecasts or pseudoscientific forecasts. Among Mexican Americans pseudoscientific announcements were most often mentioned, while among Blacks general forecasts were most frequent. The two kinds were about equally often mentioned by White Anglos. Compared with the minority groups, White Anglos mentioned announcements traceable to scientific sources more often, though still not as often as they mentioned general and pseudoscientific announcements. Prophetic announcements were infrequently mentioned by all groups.

As we look at differences among the groups we should not lose sight of the fact that similarities are stronger than differences. But as we focus on the uniqueness of each group, the consistency of the Black experience with earthquake information persists. While Blacks have heard and taken seriously fewer announcements, they are less often able to be specific about the announcements they have heard. White Anglos are able, because of their superior education or their use of more discriminating media, to be more selective in what they hear and take seriously, so they are more attuned to scientific sources than Mexican Americans, while Mexican Americans are more exposed to pseudoscientific announcements.

Not all announcements that are remembered are taken equally seriously. The comparison among ethnic groups can be repeated using only announcements that are taken "quite seriously" or "fairly seriously" to see whether the same patterns appear. The listing of only announcements taken seriously (Table 7) repeats the pattern of announcements remembered with the ethnic differences intensified. The modal types are now general for Blacks, pseudoscientific for Mexican Americans, and scientific for White Anglos. While scientific announcements are taken seriously slightly more often than general or pseudoscientific announcements by White Anglos, general announcements are taken seriously three times as often as scientific announcements by Blacks, and pseudoscientifc announcements more than five times as often as scientific announcements by Mexican Americans. A glance at the bottom section of the table sheds further light on the differences. The differences between Blacks and White Anglos are almost entirely attributable to differences in what they have heard and remembered. The percentages of each type of announcement taken seriously are very similar. But Mexican Americans are much more skeptical of scientific announcements and much less skeptical of pseudoscientific and especially

prophetic announcements than either Blacks or White Anglos.

Awareness of the Uplift. Spontaneous mentions of the southern California Uplift are included among the predictive announcements traceable to scientific sources. But awareness of the Uplift is especially important because announcement of the Uplift in February, 1976, began the period of heightened earthquake vigilance in southern California and remains the most graphic reason for continued special concern. We asked repondents who had not mentioned the Uplift whether they remembered hearing about "a bulge in the earth in the Mojave Desert near Palmdale." Respondents who mentioned the Uplift spontaneously and those who answered the later question affirmatively were combined in an effort to assess awareness of the Uplift. All respondents who had heard of the Uplift were asked whether they thought scientists were saying that the "Bulge" might signify a coming earthquake. Those who answered "No" or "Don't know" were classified as having heard but not understood the significance of the Uplift. Those who thought the Uplift might signify a coming earthquake were then asked:

> If the bulge should signify a coming earthquake, in your opinion, do you think there will be damage where you live?

People who answered a "a great deal" or "some" were classified as seeing the Uplift as personally relevant. The distribution of people by these four categories of awareness of the Uplift for each of the ethnic groups is given in Table 8.

The differences among the three groups in awareness of the Uplift are more striking than the difference in awareness of miscellaneous predictions and forecasts, and indeed more striking than for most other variables in the investigation. More than twice as many Blacks and Mexican Americans have not heard of the Uplift as is true for White Anglos. Slightly more Blacks than Mexican

TABLE 8

AWARENESS OF THE SOUTHERN CALIFORNIA UPLIFT BY ETHNICITY

Awareneness of the Uplift	Black	Mexican American	White Anglo
Not heard of the Uplift	63.3	68.1	30.9
Heard but not understood	14.8	5.9	19.1
Heard and understood	6.9	9.0	20.4
Heard, understood, & relevant	15.0	17.0	29.6
Total	100.0	100.0	100.0

Americans say they have heard of the Uplift. However, among those who say they have heard of the Bulge, Blacks are most likely and Mexican Americans least likely to have missed the significance of the Uplift for earthquake risk. As a consequence of the Mexican Americans' greater understanding of what they have heard (or perhaps their greater honesty in admitting that they have not heard of the Uplift), as compared with both other groups, the proportions who have heard of the Uplift and understood its connection with earthquake danger are 50.0 percent for White Anglos, 26.0 percent for Mexican Americans, and 21.9 percent for Blacks. The great majority of respondents in both of the minority communities are unaware of the Uplift as a potential earthquake precursor.

Among those who have heard and understood, there is not much difference in the proportions who anticipate damage where they live, though the Mexican Americans are slightly more likely to see the Uplift as relevant and Blacks are least likely to do so.

Awareness of personal vulnerability. In the typology of awareness of the Uplift we have included the dimension of seeing the personal relevance of an area condition. We have explored further the awareness of personal risk. Los Angeles City librarians, replying to a survey about public inquiries in earthquake topics, indicated that the most frequent request for information from the public was to find out the location of earthquake faults. If people were actively concerned about the earthquake threat, we assume that they would have sought information or at least formed an opinion on whether there was a fault near their homes. We are not able to say whether the judgment people have formed is correct or incorrect. But we are interested in the extent to which they have formed opinions, and the extent to which they believe their own residences to be at possible risk.

Respondents were asked:

> Do you happen to know whether there is an earthquake fault within one mile of this property?

White Anglos most often say there definitely or probably is a fault within a mile and Mexican Americans least often say so (Table 9). But if we count only those who have an opinion, 63 percent of Blacks think there is a fault within a mile, 46 percent of White Anglos think so, and 37 percent of Mexican Americans think so. Since earthquake faults do not appear to be disproportionately distributed according to ethnic residence areas, we are disposed to interpret these answers more as generalized assessments of personal risk than as reports of objective conditions.

The greatest differences are not in whether people believe they are safe or at risk but in whether they think they know whether there is a fault nearby. White Anglos most often who have opinions on this matter and are most often definite in their opinions, whether positive or negative. Mexican Americans have the most who acknowledge that they don't know, and the fewest who are definite about the proximity of a fault. Blacks are intermediate in this respect.

In another series of questions, respondents were asked whether they knew of any groups in the community who were in especially acute danger in an earthquake, and whether they included themselves in any of these groups. Less than 20 percent of the entire sample included themselves in such groups, and the differences among the ethnic groups were not statistically significant. Thus, as we approach the question of a sense of personal vulnerability in two different ways we have two different findings. The findings about supposed proximity to an earthquake fault are strong enough to stand on their own. But the proper interpretation to be made of them is rendered less clear by the evidence on membership in endangered groups.

TABLE 9

SUPPOSED PROXIMITY TO AN EARTHQUAKE FAULT BY ETHNICITY

Fault within mile of residence?	Black	Mexican American	White Anglo
Definitely is	3.4	2.7	8.6
Probably is	15.2	8.0	11.4
Don't know	52.1	60.6	36.5
Probably is not	13.8	15.4	25.6
Definitely is not	15.5	13.3	17.9
Total	100.0	100.0	100.0

Fear, concern, and expectation. Findings from the general survey indicate that fear of earthquakes is a rather stable condition which is affected very little by changing attention to earthquake topics. As an underlying attitude, fear of earthquakes should affect the way in which people interpret news about earthquake threat and the experience of earthquakes. Based on a three-item index, there are significant and clear but moderate differences in earthquake fear and concern by ethnic groups. White Anglos express the least fear, Mexican Americans the most, and Blacks are intermediate (Table 10). This pattern does not correspond with the pattern of fear reported for actual earthquake experiences. Not everyone has experienced earthquakes, so the latter pattern is based on a subsample from the former sample and may not be exactly comparable. However, referring back to Table 12 in Chapter Four, Blacks reported being most frightened during earthquakes they had experienced, and Mexican Americans were intermediate. White Anglos reported least fear in both contexts.

We can only speculate about the differences in the two patterns, but the speculations may shed important light on the distinctive ethnic experience of the threat of disaster. A difference in time perspective between Blacks and Mexican Americans could account for the findings. Let us assume that Blacks and Mexican Americans are both more fearful of earthquakes than White Anglos, but that more Blacks are oriented to present time and more Mexican Americans to future time. The experience of the moment would then be unsettling to more Blacks than Mexican Americans. But more Mexican Americans would experience worry and fear in anticipation of a future earthquake. Since fatalism is generally known to be associated with present time orientation and nonfatalistic attitudes to future time orientation, this interpretation allows us to see the findings about fear and the findings about earthquake

TABLE 10

FEAR, CONCERN, AND EXPECTATION OF EARTHQUAKE BY ETHNICITY

Fear & concern, expectation	Black	Mexican American	White Anglo
Fear & concern Index:			
Low fear	24.4	21.9	28.1
Low Medium fear	27.3	27.3	32.6
High medium fear	20.7	16.6	17.3
High fear	27.6	34.2	22.0
Total	100.0	100.0	100.0
Changed concern in past year:			
Concern decreased	7.0	7.5	3.5
Concern remained same	69.8	59.4	65.9
Concern increased	23.2	33.1	30.6
Total	100.0	100.0	100.0
Will be damaging earthquake in next year:			
Definitely not	6.9	6.9	6.1
Probably not	45.7	30.3	49.1
Don't know	4.8	1.6	6.0
Probably will	38.4	51.6	34.2
Definitely will	4.2	9.6	4.6
Total	100.0	100.0	100.0

fatalism as being consistent.

In order to complement the questions on fear and concern as relatively stable attitudes we asked whether concern had changed during the preceding year. This was the year during which the Uplift, Whitcomb's near prediction, and Minturn's forecast were announced, and during which such major earthquakes as those in Guatemala, the People's Republic of China, and northern Italy occurred. The differences are significant but not striking. Blacks report the least change and Mexican Americans the most change. Mexican Americans changed most in both directions, toward more concern and less concern, though most of the change was toward greater concern.

Again, a plausible interpretation of reported change in concern over the earthquake threat can easily be made. First, from other evidence it appears that a high level of fear is an unstable state. With more Mexican Americans experiencing high fear, it is to be expected that their concern over the preceding year would be more subject to erratic change. While substantial numbers of Blacks are also quite fearful, more Blacks are relatively out of touch with news and other communication about the earthquake threat. Thus, Blacks show the least increase in concern, but are not very different from Mexican Americans in decreased concern. With fewer people very fearful of earthquakes and fewer out of communication on earthquake topics, White Anglos are more likely than Blacks to have experienced increased concern and more likely than Mexican Americans to have experienced no change in concern.

Affect and cognition should go together in a systematic fashion. Changed concern about the earthquake prospect should be related to the expectation of an earthquake in the near future. Respondents were asked:

> How likely do you think it is that there will be a damaging earthquake in southern California <u>within the next year</u>?

The ethnic differences in answers to this question suggest a relationship, but one that is only partially obvious. Blacks and White Anglos are fairly similar in degree of earthquake expectation. There is no parallel here with the more frequently reported increased concern among White Anglos compared with Blacks. But Mexican Americans stand out strongly from both of the other groups. Substantially more Mexican Americans say that there will definitely or probably be an earthquake fear and the greater volatility of Mexican Americans' concern, but the degree of difference is surprising. Among Mexican Americans, 61.2 percent say there probably or definitely will be a damaging earthquake, compared to 42.6 percent among Blacks and 38.8 percent among White Anglos.

If the high rate of earthquake expectation among Mexican Americans is surprising when related to the more modest differences in fear and changed concern, it is even more surprising when compared with levels of awareness of the Uplift and of earthquake announcements. Both Mexican Americans and Blacks are less likely than White Anglos to have heard of the Uplift, though Mexican Americans who have heard are more likely to have grasped the possible conncetion with future earthquakes. Mexican Americans remember fewer predictive announcements than White Anglos, but take more seriously. In the summary of earthquake content in La Opinion we observed that the coverage of possible earthquake precursors in southern California was meager. Thus we find a consistent pattern in which Mexican Americans are less exposed than White Anglos to news about earthquake prospects, but take more seriously the little that they hear.

The high Mexican American expectation for a damaging earthquake in spite of low exposure to relevant information may have a cultural explanation, or the key may be found in another feature of earthquake treatment in La Opinion. The neglect of news about local earthquake prospects was more than offset by the emphasis on Latin American earthquakes. The accounts were often sensationalist and emphasized the close ties between the victims and the entire Latin American

community. While fewer Mexican Americans than White Anglos have had direct personal experience with damaging or benign earthquakes, the vicarious experience with the Guatemala quake has been more recent and may have been more vital than the experience of White Anglos with the less tragic California tremors of the last half century.

In all groups there are more respondents who say there probably or definitely will be a damaging earthquake within a year than there are who remember some earthquake forecast announcement that they take seriously (Tables 7 and 10). The discrepancy is least for White Anglos, with a ratio of 1.09 respondents who expect an earthquake to each respondent who remembers one or more announcements taken seriously. By contrast, the ratios are 1.49 and 1.40 for Blacks and Mexican Americans respectively. The minority groups are fairly alike in the extent to which earthquake expectation is detached from the memory of specific credible announcements. The high ratio of "free-floating" earthquake expectation to identifiable information suggests that more Blacks and Mexican Americans than White Anglos may be slow to adjust their expectations sensitively as new credible information is publicly announced.

Releasing earthquake predictions. The obverse of awareness and concern is the desire to be informed of impending disaster. The question is whether people wish to hear about earthquake predictions or would rather have the information withheld from the public.

Attitude toward releasing earthquake predictions is at least partially the expression of a kind of trust. It requires a good deal of confidence in

the good judgment and emotional stability of the general public to favor the prompt and open announcement of all predictions. People with less sanguine estimates of public response will generally favor greater caution. Caution may entail requiring a high degree of certainty before a prediction is announced publicly, or proposing delay until the time of the anticipated earthquake is near. Needless to say, these judgments also speak to confidence in scientific prediction, so we expect people who have greatest confidence in science and in scientific prediction to be least cautious about releasing predictions publicly.

Respondents were asked:

> If there is information indicating that there will be a damaging earthquake in the near future, please . . . tell me how certain you think this prediction should be before a public announcement is made.

Respondents were allowed to choose from five answers indicating various degrees of certainty, but the interesting differences are chiefly between the most cautious respondents who call for 90 to 100 percent certainty ("definitely sure the earthquake will occur") and all others. Over 40 percent of Blacks adopt this very cautious position, while only 28 percent of White Anglos do so (Table 11). An intermediate 34 percent of Mexican Americans are equally cautious.

On the other hand, if the question is when to issue an uncertain prediction, the pattern is somewhat different. The question of when a prediction should be publicly announced was asked twice, once for a prediction with 50 percent probability of occurring and once for a prediction with 90 to 100 percent certainty. For these questions, the interesting differences, though weaker than for the previous question, distinguished respondents who would delay for

TABLE 11

ATTITUDES TOWARD PUBLIC RELEASE OF EARTHQUAKE PREDICTIONS BY ETHNICITY

Attitude toward public release	Black	Mexican American	White Anglo
How certain before public announcement?			
Only when definitely sure	40.8	34.8	28.0
Other	59.2	65.2	72.0
Total	100.0	100.0	100.0
When should prediction be made public, if 50-50 chance?			
Only after delay	58.6	68.6	57.8
Immediately	41.4	31.4	42.2
Total	100.0	100.0	100.0
When should prediction be made public, if 90-100% sure?			
Only after delay	33.2	40.4	33.0
Immediately	66.8	59.6	67.0
Total	100.0	100.0	100.0
Public release index			
Unfavorable	33.2	39.2	33.9
Intermediate	37.1	35.5	29.1
Favorable	29.7	35.3	37.0
Total	100.0	100.0	100.0

any length of time from those who would release the prediction immediately. The White Anglos and the Blacks are alike in the proportions favoring immediate release, and the Mexican Americans are more cautious. This difference is not significant for the highly confident prediction, and qualifies at only the five percent level for the uncertain prediction. However, differences are in the same direction.

When answers to the three questions are combined into a summary index of attitude toward public release of earthquake predictions, White Anglos are most favorable and Mexican Americans least favorable toward release. However, the pattern is complicated and tends to be obscured by the index. While White Anglos are consistently more favorable toward release and toward release without delay, Mexican Americans and Blacks express caution differently. Blacks are more skeptical about releasing predictions until scientists are just about certain the earthquake will occur, but if predictions are to be released they are just as willing as White Anglos to have them released immediately. Mexican Americans are like White Anglos in having fewer qualms about releasing uncertain predictions, but they are more disposed to delay the release than Blacks.

Disposition Toward Action

Among the most important payoffs from prior experience, involvement in communication systems, and earthquake awareness should be personal preparedness and well formed conceptions of appropriate action by public agencies. We have attempted to assess both personal preparedness and orientation toward community action.

Personal preparedness. Unfortunately, it is not a simple matter to assess a household's state of preparation for an earthquake. We used a check

list of recommended steps, but there are inescapable problems with this technique. For one thing, unless we could physically inspect the premises, we had to depend on the respondent's own understanding and candor. In order to insure understanding, we avoided asking about measures that might not be clear to the uninitiated. To encourage candor we gave respondents an explicit choice between saying they had taken a certain step, had not taken it but planned to do so, and had no plans to do so. Later, we disregarded the statements of intention and analyzed responses simply on the basis of whether respondents had or had not taken a given step.

Another difficulty comes from the fact that many of the recommended preparedness measures are steps that would normally be taken for other reasons than in preparation for an earthquake. For example, a working flashlight is part of any well-equipped household, whether in earthquake country or elsewhere. In asking about each preparedness measure we asked whether the step had been taken "because of a future earthquake or for some other reasons." The results do give some indication of how much difference earthquake awareness has made. But in actuality, there is relatively little for a well-equipped household to do specifically because of the earthquake threat. Hence, for the most part, we are limited to ascertaining how well-prepared each household is, regardless of whether preparations were directly stimulated by earthquake hazard or were the signs of an orderly household, well-equipped for a variety of emergencies.

The items are listed in Table 12 in similarity groups. Having a working flashlight, a working battery-operated radio, and a first aid kit are the measures most commonly taken. This equipment is generally on hand for other reasons, although significant numbers in each of the ethnic groups made preparation specifically with the earthquake threat in mind. More White Anglos are prepared with each of these items than is true for Blacks or Mexican Americans.

Preparedness measure	Black		Mexican American		White Anglo	
	% taken step	(for earth-quake)	% taken step	(for earth-quake)	% taken step	(for earth-quake)
Have working flash light	59.8	(15.2)	52.7	(12.2)	77.6	(8.9)
Working battery-operated radio	51.4	(14.7)	41.0	(11.7)	58.9	(9.9)
First aid kit	41.1	(10.0)	44.7	(10.6)	59.0	(6.6)
Store canned/dried food	19.2	(5.6)	21.8	(9.6)	29.2	(8.1)
Store water	6.9	(1.5)	13.8	(8.5)	18.8	(8.9)
Rearrange cupboard contents	8.2	(3.1)	12.8	(6.9)	17.6	(11.4)
Install cupboard latches	4.8	(1.6)	9.6	(5.9)	10.8	(4.5)
Contact neighbors/friends for information and ideas	8.9	(5.7)	10.1	(4.3)	10.1	(8.3)
Set up neighborhood responsibility plans	4.1	(3.1)	6.9	(4.3)	3.3	(2.5)
Attend neighborhood meetings on earthquakes	2.8	(1.3)	2.1	(1.1)	1.4	(1.3)
Inquired about earthquake insurance	25.5		3.7		31.8	
Bought earthquake insurance[a]	13.3		1.2		14.7	
Structurally reinforced home[a]	13.5	(2.9)	12.2	(4.9)	11.1	(5.4)
Instructed children what to do during earthquake[b]	29.6	(28.3)	38.7	(35.5)	60.9	(57.5)
Family plans for emergency during earthquake	19.5	(14.0)	21.3	(13.3)	26.8	(20.5)
Family plans for reunion after quake	11.0	(9.7)	17.6	(15.4)	13.0	(11.5)

a. Percentabe demoninator is number of owner-occupied households.
b. Percentage denominator is number of households with children.

However, more Blacks and Mexican Americans have secured these items specifically because of a future earthquake. Differences between Blacks and Mexican Americans are not significant, except that more Blacks have working battery-operated radios.

Many fewer people have stored food and water, but earthquake awareness has made a larger relative contribution to this kind of preparedness. White Anglos are most prepared and Blacks least prepared in these respects, though the difference in food storage between Blacks and Mexican Americans is trivial. Relatively more of the Mexican Americans who have stored food and water have done so because of the earthquake threat.

Even fewer people have rearranged objects in cupboards and installed cupboard latches for safety. Again, White Anglos have taken these steps most frequently and Blacks least frequently.

Three more items involve cooperative neighborhood planning by seeking information and ideas from neighbors and friends, setting up neighborhood plans for children, the elderly, and others, and attending neighborhood or block meetings about earthquakes. Few people have been involved in such activities, and differences among ethnic groups are small and inconsistent. An index of neighborhood planning, based on how many of these three steps had been taken in a household, revealed no significant differences among the three ethnic groups.

Certain measures are recommended for homeowners, but are not ordinarily available to renters. These include the purchase of earthquake insurance and structural reinforcement of buildings. Consequently, we have computed rates of performance for buying earthquake insurance and structurally reinforcing the home only for respondents who live in owner-occupied households. There seems to be little if any difference in structural reinforcement. But Mexican Americans have strikingly less interest in earthquake insurance than either Blacks or White Anglos. Why they should differ so from Blacks is unclear--whether because of the areas they live in, because of cultural differences in appreciation of insurance as an approach to fiscal security, or simply because a more substantial minority of Blacks than of Mexican Americans are relatively assimilated into

TABLE 13

EARTHQUAKE PREPAREDNESS INDEX BY ETHNICITY

Preparedness index	Black	Mexican American	White Anglo
Low preparedness	24.5	29.3	9.3
Low medium preparedness	35.9	31.9	35.0
High medium preparedness	19.3	18.6	25.7
High preparedness	20.3	20.2	30.0
Total	100.0	100.0	100.0

the larger community educationally, economically, and culturally. We are reminded of some of the bimodal distributions we observed for Blacks earlier.

Another set of measures involve family planning. From the replies we received it appears that "family" was interpreted more inclusively than the immediate household. Hence the availability of these measures is not restricted to respondents who live in more than one-person households. They include making family plans for reunion after an earthquake and developing family plans for emergency procedures at one's residence at the time of a quake. A third measure is to instruct children on what to do during an earthquake. In computing performance rates for the first two items we used all households. In computing rates for the third measure we used only households with children in them.

Differences concerning the first two measures are not great. A few more White Anglos appear to have made family plans for what to do during an earthquake, and a few more Mexican Americans appear to have planned for reuniting the family after a quake. But the differences in rates for instructing children what to do during an earthquake are the largest of any of the items of preparedness that we have surveyed. Strikingly more of the White Anglos' households with children made this kind of preparation. There is also a more modest difference between the minority groups, with more Mexican Americans than Blacks who have children in the household reporting that they have instructed them in what to do during an earthquake.

In order to summarize the state of personal preparedness for each household, we computed a preparedness index. The index is based on the proportion of all possible steps that have actually been taken in a household. The denominator for the index is the total number of possible items, which varies among the households. For example, the respondent who lives alone in a rented household has only the first ten measures available. If the respondent completes five or the ten measures, the index value is 50. On the other hand, a family of adults and children living in their own home could have completed sixteen measures. If they too have completed five measures, their index will be only 31.

The index scores, as presented in Table 13, chiefly distinguish White Anglos from Blacks and Mexican Americans. The total score for Mexican Amercans may be slightly lower than for Blacks, but the chief difference is between the lower scores for the minority groups and the higher score for the control group. It is worth noting that these differences are based on items that each individual or household can do for themselves, rather than on neighborhood planning.

Social awareness and altruistic concern. An important question in anticipating public response to a serious earthquake warning is whether people will react strictly as individuals and families or whether there is some disposition to respond as a community. A strictly individualistic response is likely to impede cooperative attacks on the problem and intensify confusion and mutually impeding courses of action. We cannot make firm predictions concerning behavior in an actual crisis. But we have tried to find out whether people are aware of the need for special community actions to help groups of people who are in exceptional danger.

Respondents were first asked:

> If a damaging earthquake were expected in southern California, do you think any particular groups of people would be in greater danger than others, or do you feel the risk is about the same for everyone?

If respondents believed that some groups were in greater danger, they were asked to name all the groups.

In Table 14 we have reported the numbers of respondents who felt that the risk was about the same for everyone, the number who named one group in special danger, and the number who named two or more groups. Blacks are more likely than the other groups to say that the risk is about the same for everyone, and most of the remaining Blacks name only one group at risk. Nearly as many Mexican Americans as Blacks deny differential risk, but most of the remaining Mexican Americans name two or more groups. Thus, awareness

TABLE 14

SOCIAL AWARENESS OF EARTHQUAKE HAZARD BY ETHNICITY

Social awareness	Black	Mexican American	White Anglo
Awareness of groups at risk:			
Risk the same for everyone	51.4	46.3	32.7
Names one group at risk	25.0	14.4	26.5
Names two or more groups at risk	23.6	39.3	40.8
Total	100.0	100.0	100.0
Breadth of social awareness:			
Unaware	51.7	46.5	33.2
Self-interested aware	26.3	17.7	29.9
Focused aware	14.4	14.4	20.0
Broadly aware	7.6	21.4	16.9
Total	100.0	100.0	100.0
Meliorability of risk:			
Low	16.1	12.1	13.1
Low medium	21.1	32.3	24.6
High medium	51.0	32.3	44.4
High	11.8	23.3	17.9
Total	100.0	100.0	100.0

of unequal risk is greatest among White Anglos and least among Blacks. If awareness of differential risk is a precondition for altruistic concern, there may be important differences among the ethnic groups.

Since people may be members of the groups they name, awareness alone is not necessarily conducive to altruism. In order to take account of self-interested awareness of endangered groups, we established a typology that separates membership groups from nonmembership groups. Respondents were classified into four categories consisting of those who say that the risk is the same for everyone, called the unaware; respondents who mention only groups to which they belong, called the self-interested aware; those who mention one group to which they do not belong, called the focused aware; and those who name more than one group to which they do not belong, called the broadly aware.

As before, Blacks include the largest share of the socially unaware, though Mexican Americans are not far behind (Table 14). Although awareness of differential risk is not likely to be an infallible clue, it is plausible to conclude that close to half of the Blacks and Mexican Americans will be disposed to see earthquakes chiefly as crises calling for individual survival. The low social awareness of Blacks shows a consistent pattern, with more than half of the "aware" respondents mentioning only groups in which they claim membership. But differences between Mexican Americans and White Anglos are not linear. While a considerably larger proportion of White Anglos recognize that there are groups in special danger, they are disproportionately concentrated in the self-interested and focused awareness categories. Of the Mexican Americans who recognized unequal risk, relatively more are identified as broadly aware.

It may be clarifying to think of social awareness as composed of a substratum of topic awareness and a superstratum of specifically social

awareness. One must first be reasonably informed about earthquakes and earthquake safety before one's disposition toward altruism can find an avenue for expression. The finding that a large proportion of Mexican Americans are classified as socially unaware is probably more an indication of deficient topic awareness than of a fundamental lack of social awareness. Such an observation is consistent with earlier evidence of limited awareness and involvement in communication channels concerning earthquake matters. But the broad awareness of Mexican Americans who are topicly aware suggests that the potential for social awareness and altruistic concern may be greater among Mexican Americans than among either White Anglos or Blacks.

A further component of altruism is belief that something can be done for people exposed to disproportionate risk. If nothing can be done, social awareness may lead to sympathetic concern but not to altruistic assistance. For each group named, respondents were asked, "If a damaging earthquake were expected, is there anything that should be done ahead of time for the (. . .)?" The percentages in the table are based only on respondents who were aware of groups at disproportionate risk. While the differences between ethnic groups are not large or linear, Mexican Americans are somewhat more pessimistic than Blacks or White Anglos. Thus, for lack of knowledge of things that can be done, the Mexican American disposition toward social concern may not be readily translated into altruistic action.

Government action. A disposition toward collective action usually means that people look toward government to lead in dealing with public problems. The ethnic groups differ in what they expect of government and how they evaluate the earthquake preparedness efforts by government agencies.

Respondents were asked about four types of action in which government agencies have been involved. The actions were conducting prediction studies,

establishing new systems for issuing scientific earthquake predictions, enforcing building safety codes and building repairs, and providing loans to rebuild or reinforce unsafe structures before an earthquake. In order to discourage casual endorsement of all the measures, we phrased the questions so that they referred to the investment of large amounts of money in each of these activities. Respondents were asked, ". . . how important do you think it is for government to reduce the possible hazards of earthquakes by investing large amounts of money into . . . ," followed by each of the four measures. Respondents selected from five answers, ranging from "very important" to "not important at all." Answers were disproportionately concentrated in the "important" and "very important" categories for all groups. Ethnic comparisons have been made using an index that combines the degrees of endorsement for the four measures. The relative distributions of index scores for the three ethnic groups are presented in Table 15. The reader should remember that terms such as "low" and "low medium" are used in a strictly relative sense, and that most of the respondents who are classified as "low" still register considerable support for government investment in earthquake hazard reduction activities.

The distributions reveal an apparent reversal of the usual differences among the three ethnic groups. While White Anglos are generally more informed and in communication about the earthquake threat, they are least ready to invest large sums of government money in hazard reducing activities. Mexican Americans are most favorable toward investing money and Blacks are intermediate. In a later stage in the analysis we shall examine the hypothesis that there is a simple inverse relationship between socioeconomic status and willingness for government to spend money--that those who bear the heaviest tax burden want to reduce goverment spending, while those who pay the least do not think of government spending as a cost to them. Alternatively, Blacks and Mexican Americans, having less money themselves, may find it harder to imagine that these essential activities could be financed by private individuals and businesses, and consequently see government spending as the only feasible way to handle them.

TABLE 15

ATTITUDE TOWARD GOVERNMENT SPENDING FOR EARTHQUAKE HAZARD REDUCTION BY ETHNICITY

Government spending	Black	Mexican American	White Anglo
Importance of government spending for all hazard reduction purposes:			
Low	25.2	14.9	32.2
Low medium	24.6	25.4	24.7
High medium	26.0	26.0	23.7
High	24.2	33.7	19.4
Total	100.0	100.0	100.0
Importance of government spending for building safety:			
Low	28.0	28.7	38.1
Medium	16.7	22.1	23.2
High	55.3	49.2	38.7
Total	100.0	100.0	100.0
Importance of government spending for prediction and warning:			
Low	35.7	18.6	34.9
Medium	33.8	35.6	37.1
High	30.5	45.8	28.0
Total	100.0	100.0	100.0

Two of the proposed government measures deal with the structural safety of buildings and two deal with prediction and warning. Importance ratings are lower for the latter than for the former. A separate index developed for each pair so that we can compare priorities in hazard reduction. When we consider only government investment for building inspection and loans for upgrading unsafe structures the Blacks are most favorable. White Anglos are still least favorable, but Mexican Americans are now intermediate in their attitudes. The difference between Blacks and Mexican Americans is not great, however. In contrast, Mexican Americans are strikingly more favorable toward spending for prediction studies and for warning systems than either Blacks or White Anglos. Differences between Blacks and White Anglos are trivial in this respect.

If we assume that investment in buildings is more tangible and involves less faith in science and the future than investment in prediction, fewer Blacks than Mexican Americans will gamble on science and the future. This finding is consistent with the greater skepticism of Blacks about prediction and their more fatalistic attitude about earthquakes. The finding should also be examined in relation to the earlier observation (Table 11) that Mexican Americans are generally more favorable to the public release of earthquake predictions than Blacks, and are willing to allow release of less certain predictions than Blacks, though they more often favor delaying the release until near to the predicted time for the earthquake. The greater Black support for investment in building inspection and loans for upgrading unsafe structures is consistent with their disproportionate discussion of the problem of old and unsafe buildings. The findings lends further plausibility to the assumption that racial overtones have sensitized some Blacks to the problem posed by seismically unsafe buildings.

TABLE 16

WHO SHOULD RELEASE PREDICTIONS BY EHTNICITY

Who should release predictions	Black	Mexican American	White Anglo
Scientists	29.0	26.1	27.5
Scientists and officials	35.7	28.7	30.4
Government officials	30.2	42.0	37.6
Other and Don't know	5.1	3.2	4.5
Total	100.0	100.0	100.0

The impression of an apparent disposition to look toward government on the part of Mexican Americans is reinforced by the three groups' answers to who should release predictions. Although the differences are not large, Mexican Americans are more disposed to make the release of predictions the exclusive responsibility of government (Table 16). Possibly reflecting more distrust of government in the Black community, Blacks least often assign exclusive responsibility to government.

If both Blacks and Mexican Americans in large numbers look to government and think it important for government to invest heavily in earthquake hazard reduction, do they have any ideas about what government should be doing, or are they simply shifting the responsibility for thinking about what can be done onto government officials? Respondents were asked an open-ended question to which as many as five answers were recorded, as follows:

> Given the fact that earthquakes do occur in southern California, what do you think are the most important things government agencies should be doing now to prepare for future earthquakes?

Very few people in any of the ethnic groups were unable to offer any suggestions, and the median number of suggestions in each of the groups was between two and three (Table 17). No effort was made to evaluate suggestions. Without much more lengthy probing the responses could not be sufficiently detailed to allow fair evaluations. But we were primarily concerned to know whether people had given enough thought to the question to have some ready answers. The differences among the groups are small. White Anglos offer significantly, but only slightly more suggestions than members of the minority groups. Blacks and Mexican Americans differ very little, except that Blacks once again show a bimodal distribution, with more Blacks offering no suggestions or only one, and more Blacks offering three or more suggestions.

TABLE 17

SUGGESTIONS FOR GOVERNMENT ACTION BY ETHNICITY

Government action	Black	Mexican American	White Anglo
Number of suggestions:			
None	12.9	13.3	8.8
One	26.0	21.8	23.2
Two	23.4	35.1	28.3
Three	23.5	19.7	21.7
Four or five	14.2	10.1	18.0
Total	100.0	100.0	100.0
Median number of suggestions	2.48	2.42	2.64
Nature of suggestions:			
Promote structural safety	32.9	22.7	36.0
Educate for earthquake safety	25.9	33.9	25.4
Prepare for emergency relief	28.7	34.7	25.0
Promote scientific research	6.5	3.7	9.1
Other	6.0	5.0	4.5
Total	100.0	100.0	100.0

There are some differences, however, in the kinds of suggestions made by the three groups. The greatest differences are between Mexican Americans and White Anglos, with Blacks falling generally between the other two groups. Promoting structural safety and supporting scientific research, including research in earthquake prediction, receive more support among White Anglos. Educating the public for earthquake safety and preparing emergency relief facilities are more often mentioned by Mexican Americans. When Blacks and Mexican Americans are compared, the greatest difference is in the more frequent mention of structural safety by Blacks. This observation is consistent with the earlier finding that Blacks are more sensitized to the building safety issue than Mexican Americans. The number of people suggesting scientific research is small in all groups, but there is more support among Blacks than among Mexican Americans.

If ethnic groups differ in the extent to which they turn to government for security in the face of impending earthquakes, do they also differ in their evaluation of the job that government officials are doing? Respondents were asked a simple and direct question:

> In dealing with earthquake preparedness problems, would you say public officials are doing a: Good job, Average job, or A poor job?

The results are presented in Table 18. The modal answer for each group is "an average job." But the Mexican Americans stand out for expressing the most favorable evaluation. Fewer Mexican Americans believe officials are doing a poor job and more believe they are doing a good job. The differences between Blacks and White Anglos are more complex. Fewer Blacks than either White Anglos or Mexican Americans are willing to say that officials are doing a

TABLE 18

EVALUATION OF GOVERNMENT PREPAREDNESS BY ETHNICITY

Evaluation	Black	Mexican American	White Anglo
Doing a poor job	25.7	16.5	33.1
Doing an average job	44.9	42.5	39.3
Doing a good job	13.7	27.7	17.8
No evaluation made	15.7	13.3	9.8
Total	100.0	100.0	100.0

good job. But in not rating official performance as "good" the Blacks tend toward calling it "average" or saying they don't know. As a consequence, more White Anglos than Blacks or Mexican Americans say that officials are doing a poor job.

Another way to compare the groups is to look only at the good and poor ratings. Considerably more Mexican Americans rate official performance as good than rate it poor. The balance is clearly positive toward government. But among both Blacks and White Anglos considerably more rate official performance poor than rate it good. The balance is definitely negative. Though alike in their negativism toward government officials, Blacks and White Anglos may reflect different mixtures of two kinds of disaffection. One type of disaffection comes from being engaged with government and not liking what one sees. This kind of disaffection is most likely expressed by way of a definite evaluation, most common among White Anglos. The other kind of disaffection

comes from nonengagement or alienation from government, and is more likely expressed by avoiding positive evaluation but tending toward the lack of strong conviction often reflected in "average" and "don't know" responses. While both groups include both kinds of negativism, Blacks may include more unengaged negativism.

Summary

The Black sample. The bimodal pattern among Blacks applies to communication concerning earthquake topics. In general, Blacks are least engaged in all kinds of communication about earthquakes, though a portion of the sample stands out as undistinguishable from White Anglos in this respect. Blacks rely most exclusively on television and least on newspapers, where more penetrating accounts are to be found, for information about predictions, near predictions, and forecasts. Fewer Blacks have engaged in discussion, and those who have done so have discussed fewer topics with a narrower range of partners. Such discussion remains more consistently outside of the family with friends and neighbors than for the other groups. One topic attracts relatively (but not absolutely) more discussion among Blacks, and that is the problem of old, seismically unsafe buildings. A larger proportion of Blacks learn about earthquake matters from the media without filtering and extending the communication through discussion.

Fewer Blacks remember hearing earthquake predictions or forecasts, and more of the announcements they remember are of the general and vague kind. Among the announcements they remember, Blacks are disproportionately disposed to take seriously these same general announcements, rather than the more specific scientific, pseudoscientific, and prophetic announcements. Fewer Blacks are aware of the southern California Uplift at any of the awareness

levels. Blacks are intermediate between White Anglos and Mexican Americans in the proportion who think they know whether there is an earthquake fault near their residence. But Blacks are no less inclined than White Anglos to expect a damaging earthquake within a year, and more of the Blacks who have opinions about fault location believe there is a fault within a mile of their homes.

From these observations it is clear that limited and principally vague awareness and the skepticism about prediction noted earlier do not signify that Blacks discount the earthquake threat or consider themselves immune to its effects. Nearly half as many more Blacks expect a damaging earthquake soon as remember a credible warning announcement. Skepticism applies principally to specifics--predictions of time, place, and magnitude and the claims of individuals to make predictions, and measures for alleviating the effects of earthquakes--and not to the prospect and imminence of disaster. Fatalism, skepticism over human capacity to predict or control events and their human consequences, and a disposition to anticipate that the worst may happen form a comprehensive pattern that is more prevalent in the Black population than in other groups.

A contrast between the intermediate fear and concern over the prospect of a damaging earthquake and the high degree of fear experienced during past earthquakes suggests again the more frequent orientation to the present rather than the future and the more widespread fatalism among Blacks. Consistently, fewer Blacks than either Mexican Americans or White Anglos say their concern over the prospect of an earthquake has increased during the preceding year. Fewest Blacks favor the release of uncertain earthquake predictions. That this finding indicates skepticism about prediction rather than fear of knowing the worst is indicated by the companion finding that if a prediction is to be released, Blacks are like White Anglos in generally favoring immediate release rather than delay.

More Blacks than either Mexican Americans or White Anglos tend to see earthquake survival in individualistic terms, with everyone equally at risk and least awareness of groups in need of special attention from the community. But, like Mexican Americans, they are also less well prepared personally for an earthquake. And they are more favorable than White Anglos toward investment of large amounts of public money into earthquake hazard reduction. Blacks are like White Anglos in being less favorable toward spending for improved prediction and for better warning systems than Mexican Americans are. But Blacks are more favorable than either of the other groups toward government spending for building inspection and code enforcement and for loans to upgrade unsafe structures. Although the mean number of ideas for government action among the Blacks is less than for White Anglos, the distribution again is bimodal, with a substantial Blacks minority offering several suggestions. Like White Anglos, more Blacks think poorly than well of government earthquake hazard reduction efforts. But Blacks are especially noteworthy for the number who say government officials are doing "an average job" or say they don't know, in contrast to the larger number of White Anglos with definitely negative opinions. And fewest Blacks would place the responsibility to release predictions exclusively with government.

Three general attitudes seem to run through these observations about Blacks and government. First, there is probably more ambivalence toward government among Blacks. While there is more distrust of officials and skepticism over the efficacy of government programs, there is a strong tendency to look toward government to deal with problems. Second, like Mexican Americans, Blacks do not share the resistance toward government spending that many White Anglos feel. And third, the Black negativism toward government is more of an unengaged and weakly committed negativism rather than a firmly committed and engaged negativism such as substantial number of White Anglos feel.

The Mexican American sample. In general, Mexican Americans are intermediate between Blacks and White Anglos in their exposure to media communication about earthquake matters and their involvement in discussion. Relative to the other groups, they rely more on motion pictures and radio for earthquake information. For those who do discuss earthquake matters, the range of topics and partners is wider than among the other groups. More of the discussion takes place within the family. Family and other interpersonal discussion appears to complement rather than displace attention to more authoritative media sources, as indicated by the fact that Mexican Americans are not significantly more disposed than the other groups to name relatives, friends, and coworkers as their chief sources of information about impending earthquakes.

Mexican Americans are intermediate in the number of predictions and forecasts they have heard, but are least skeptical of those they remember. Compared with the other groups they most often remember pseudoscientific announcements, and of those they remember, they are most likely to take seriously the pseudoscientific forecasts. While fewer Mexican Americans than White Anglos have heard of the southern California Uplift, more of those who have heard understand that the Uplift may signify a coming earthquake and appreciate that it may bring damage where they live. Fewer Mexican Americans think they know whether there is a fault near their home, though more have opinions on whether there will or won't be a damaging earthquake within the year.

The picture of limited information combined with a tendency to take seriously whatever information they have seems fairly consistent. Although Mexican Americans were less frightened by the generally nondestructive earthquakes they have already experienced, they are more fearful and concerned over the prospect of a damaging earthquake than either Blacks or White Anglos, and more of them say their concern has increased during the past year.

The most striking difference is the high proportion of Mexican Americns who expect a damaging earthquake within a year--considerably higher than the proportion who remember an identifiable credible warning announcement. Only the finding that fewest Mexican Americans think there is an earthquake fault near their homes runs counter to the general pattern.

Fear of impending earthquakes and widespread anticipation of a serious quake may be translated into caution over releasing predictions. Mexican Americans are intermediate in their attitude toward releasing uncertain earthquake predictions, but are most often disposed toward delaying release until near to the time of the predicted event.

Like Blacks, Mexican Americans are generally less prepared than White Anglos for an earthquake. But they stand out for their lack of interest in earthquake insurance. Apparantly contradictory findings concerning social awareness suggest the following interpretation. General awareness of earthquake matters is lower among Mexican Americans than among White Anglos, but Mexican Americans are more disposed than either White Anglos or Blacks to translate whatever awareness they have into social awareness. Except for a certain pessimism about being able to do anything for groups in special danger, Mexican Americans are probably most disposed toward altruistic views of the earthquake threat.

Mexican Americans are most favorable toward government spending, especially for improved prediction and for better warning systems. They are most inclined to place the responsibility to release predictions exclusively with government. They have fewer suggestions for government action than White Anglos, but their evaluation of government actions is most favorable. In short, Mexican Americans stand out for their tendency to look toward government and for their positive attitude toward government. They exhibit less

of the ambivalence so prevalent among both Blacks and White Anglos.

The White Anglo sample. White Anglos use the widest range of media sources and rely more than the other groups on newspapers and television specials and most often complement media sources with discussion. They remember more predictions and forecasts, and especially more scientific announcements. Among the announcements they have heard, they are especially disposed to take the scientific announcements seriously. More have heard about, and appreciated the Uplift, though a larger proportion than among Mexican Americans have heard without connecting the Uplift to a possible earthquake. They most often think they know whether there is a fault near their homes. They express least fear about past and future earthquakes, though many acknowledge increased concern during the preceding year. Like Blacks, nearly half expect a damaging earthquake within a year. They are most favorable toward releasing uncertain predictions and doing so immediately.

White Anglos are generally better prepared for an earthquake and are most aware of groups subject to exceptional earthquake risk, though their disposition toward altrusim may be less than that of Mexican Americans. They are least favorable toward government spending on either building safety or improved prediction and warning. They have more suggestions for government action, and more White Anglos think government officials are doing a poor job in earthquake hazard reduction.

CHAPTER SIX

REFINING THE ETHNIC COMPARISON

For public officials seeking to raise the level of earthquake preparedness in the community or media personnel seeking to inform the community about earthquake safety the comparisons among ethnic and racial groups in the preceding chapters may suffice. But in order to understand the differences better we must carry the analysis one step further.

Separating Subculture from Life Situation

In the opening chapter we suggested that the immediate causes for differing perceptions and responses to risk between racial and ethnic groups might lie in either subculture or shared life situation. Subculture elements are socially transmitted as part of the group's cultural heritage and may or may not be obviously utilitarian or adaptive. Life situations consist of problems, opportunities, and resources. Confronting similar life situations, members of a racial or ethnic group may devise similar patterns of response as ways of adapting to those situations.

Besides being theoretically interesting, it is practically useful to separate these two causes whenever possible. In the short term members of each group must usually be dealt with as they are. But long term solutions most often require either concerted efforts to alter life situations or the invention of new ways of adapting to the existing life situation.

Perhaps the most pervasive aspect of life situation is the complex of characteristics that defines an individual's or a group's place in the system of social stratification. Three of the most important elements in this complex are level of education, level of income, and occupation social standing.

The racial and ethnic groups differ markedly on these variables. The White Anglo averages are generally higher on all three measures. But as we noted in Chapter Four, Blacks and Mexican Americans are neither consistently alike nor consistently different. While the average educational level and the average occupational rating for Blacks are significantly and substantially higher than for Mexican Americans, household incomes are not significantly different.

Age also pervasively affects life situation. Needs, opportunities, and resources all can vary drastically with age. White Anglos are a substantially older population than Blacks and Mexican Americans.

A third life situation variable is prior earthquake experience. White Anglos have had more experience with damaging earthquakes than the other two groups, and they report more damage in past earthquakes to themselves and to people they know. Mexican Americans also have had less experience with other natural disasters besides earthquakes than either Blacks or White Anglos.

Before we attempted to control these life situation variables statistically, it was essential to determine which ones were sufficiently correlated with a variety of earthquake perception and response variables to warrant their use as controls. For this purpose we examined correlations among variables in the primary sample consisting of 1450 Los Angeles residents, undifferentiated by race and ethnicity. Twenty four representative variables were included in this analysis. Surprisingly, the measures of earthquake experience were correlated with relatively few of the interesting response variables, and the correlations were fairly weak. As a consequence the decision was made not to use earthquake experience as a control initially. As the analysis elsewhere in the report will indicate, while general earthquake experience is not a powerful variable in predicting awareness and response, personal experience of earthquake damage or injury or damage or injury to a close associate is more powerful than general earthquake experience. But this kind of first-hand experience is limited to a

small fraction of the population, and was therefore not used a control.

Age, respondent educational level, household income, and breadwinner's occupational rating were significantly correlated with most of the variables in which we are interested, and also with extent of earthquake experience. Hence these four controls may well subsume some of the apparent effect of differing experience with earthquakes. These associations are presented in Table 1.

A word should be said about the three stratification variables. We used the respondent's level of education, regardless of his or her position in the household and regardless of other members' educational attainment. If the respondent was working full time, we used his or her occupational status. If not, we used the occupational status of the person designated as household head or spouse.

Income was reported for the household rather than for individuals, but the number of people dependent on the household income ranged from one to more than ten. As a correction for variable household size, we first secured a measure of per capita income by dividing household income by the number of persons dependent on that income. This operation clearly introduces equally important errors of another kind since it makes no allowance for the reduced per capita costs when houshold expenses are shared. Hence we devised a measure of income adequacy. On the basis of U.S. Bureau of Labor Statistics (U.S. Department of Labor, 1976) estimates of the cost of maintaining an acceptable standard of living for households of various size and age composition, household income was divided by an index that reflected these two characteristics. In use, however, neither income adequacy nor per capita income was related to as many of the important variables under investigation as the simple measure of total household income. The implications of this finding warrant examination in relation to various theories of social stratification, since it is clearly not

TABLE 1

CORRELATIONS BETWEEN CONTROL VARIABLES
AND REPRESENTATIVE VARIABLES

Variable	Degree of correlation (Tau) and Significance			
	Age	Education	Occupational tatus	Household income
Index of community attachment	.33*	-.04	--	.06
Number of newspapers read	.15*	.15*	.15*	.16*
Earthquake experience index	.18*	.08*	.12*	--
Injury or property loss from earthquake to self	.06	.06	--	--
Injury or property loss from earthquake to family or close friend	--	.20*	.16*	.16*
Residential vulnerability index	.04*	--	--	-.05*
Fatalism index	.15*	-.15*	-.09*	-.14*
Favorability toward science	--	.17*	.15*	.11
Belief in scientific prediction	--	--	--	-.03
Prediction belief pattern	-.03*	.09*	--	-.11*
Scientists holding back?	-.08*	-.05	--	-.04*
Number of media sources	-.13*	.20*	.15*	.22*
Range of earthquake topics discussed	--	.12*	--	--
Range of discussion partners	-.11*	.16*	.12*	.16*
Number of announcements heard	--	.13*	.09*	.10*
Awareness of the Uplift	.14*	.18*	.15*	.16*
Fear and concern index	-.12*	--	--	--
Expect damaging earthquake in next year?	.05*	.07*	.07	.06*
How certain before public announcement of prediction?	.06*	.06*	.04*	.01
Earthquake preparedness index	.02*	.14*	.10	.19*
Awareness of groups at risk	--	.14*	.11*	.13*
Importance of government spending for building safety	--	--	-.09*	-.11*
Importance of government spending for prediction and warning	.01	-.05	--	--

*P $\angle$ .001. For all other entries, p $\angle$ .01. Significance tests are based on Chi- square.

the simple relationship of income to need that has significant social effects so much as a general household income level. Based on this analysis we used simple household income as the control variable.

The relationships in Table 1 are generally quite modest, although we have listed only those that reach the conservative one percent level of significance. Since White Anglos are consistently both older and more socioeconomically advantaged, it is of interest to note instances in which age and socioeconomic standing have reverse associations. Older people are more fatalistic than young people, but the more advantaged are less fatalistic than the disadvantaged. Older people learn about earthquakes from a narrower range of media sources, but the advantaged learn from a wider range. And older people discuss earthquake topics with a narrower range of partners, while the discussions of people in higher socioeconomic levels range more widely. To the extent to which the effects of controlling both age and socioeconomic level cancel each other out, the observed differences between White Anglos and the minority groups on these four variables should remain after the controls have been applied.

Using the analysis of covariance. The most suitable statistical technique for determining whether the three ethnic groups still differ in significant respects after the effects of age and social stratum are removed appears to be analysis of covariance. It provides a means to adjust the earthquake threat perception and response variables statistically for these preexisting differences between ethnic and racial groups.

Analysis of covariance may be thought of as a two-step analysis of variance. In the first step, dependent variables are regressed on the covariates. By covariates we mean the variables correlated with both independent variables (ethnic and racial identity) and dependent variables, whose influence we wish to remove. Residual scores for each respondent are calculated by subtracting scores predicted on the basis of the covariates from actual scores.

These residual scores are consequently uncorrelated with the covariates. In the second step an analysis of variance is performed on the residual scores to test whether group differences remain.

In the present analysis the logic of the analysis of covariance operates as follows. First, earthquake awareness and response variables are regressed on age and social stratum. This step measures the portion of an earthquake attitude or response attributable to these features of life situation. The difference between a respondent's actual score on an earthquake response variable and the score predicted on the basis of the regression with age and the three social stratification covariates is the residual score. The residual scores are then subjected to analysis of variance to determine whether significant differences attributable to ethnic and racial subcultures remain. Analysis of covariance incorporates an additive model which, in the present application, takes the form: Observed value of earthquake response variable = Constant + Effect of ethnic or racial subculture + Effect of age and social stratum + Residual effect.

It must be noted, however, that analysis of covariance procedures are only valid if the covariates affect earthquake response variables in the same manner within each racial and ethnic group. This condition is equivalent to saying that if separate regressions of earthquake response variables on age and social stratum were performed for Blacks, Mexican Americans, and White Anglos, their slopes would be equal. A test for equal regression slopes must therefore be conducted before the actual analysis of covariance.

We have followed the strategy proposed by Kerlinger and Pedhazur (1973, p. 267), which is to determine whether the use of separate regression coefficients for each of the three groups adds significantly to the explained variance as compared to the use of a common regression coefficient. This procedure is equivalent to testing whether interactions between ethnicity

and each of the four covariates are significant.

The foregoing test was conducted on 63 variables used as dependent variables in the comparisons among ethnic and racial groups. The F ratio used to test whether the increment in the multiple correlation coefficient (R^2) is significant when interaction terms are added to the equation was significant for only two variables, and only at the five percent level. The two variables were belief that both scientists and officials are withholding information, and adherance to a skeptic prediction belief pattern. We concluded that it was safe to proceed with the use of analysis of covariance as the procedure for refining our understanding of the influence of racial and ethnic membership on earthquake awareness and response.

Residual Differences and Subcultures

Earthquake experience. We look first at selected measures of earthquake and disaster experience with ethnic differences attributable to the four covariates of age, household income, educational attainment, and occupational socioeconomic status removed. In Table 2 and the following tables we report first the level of significance for the relationship between each dependent variable and ethnicity, after differences attributable to the covariates are removed. Next we report the standardized regression coefficients for each of the minority groups compared with the White Anglo subsample. These coefficients indicate the direction and magnitude of the difference between Blacks and White Anglos and between Mexican Americans and White Anglos, and the significance of these differences taken separately, again after differences attributable to the covariates have been removed. In order to simplify the tables, we have omitted all regression coefficients that do not reach the five percent level of significance.

TABLE 2

EARTHQUAKE AND OTHER DISASTER EXPERIENCE

BY ETHNICITY WITH AGE AND STRATIFICATION CONTROLLED

Nature of experience	Significance of ethnicity (F test)	Standardized regression coefficients	
		Black	Mexican American
Earthquake experience	.277	--	--
Damaging quakes experienced	.281	--	--
Injury or property loss from earthquake to self, family, or close friend	.081	--	-.060
Experience with other disasters	.012	--	-.068

*An asterisk identifies a regression coefficient that is significant at or beyond the one percent level. Coefficients without asterisks are significant at the five percent level.

Most of the differences in earthquake and other disaster experience disappear when age and social stratification are controlled. Age is the most important covariate in this respect. Older people report more earthquake and other disaster experience than younger people, and the White Anglo subsample is distinctly older than the other ethnic subsamples. Household income is also positively related to earthquake and other disaster experience. Mexican Americans still report a little less damage and injury to self and intimates from earthquakes and a little less experience with other disasters. But in other respects Black and Mexican American experience with earthquakes and other disaster agents is fairly comparable with that of White Anglos of equivalent age and social stratum.

Personal characteristics and community attachment. Only those background items that may be important for interpreting differences in earthquake awareness and response have been included in the analysis of covariance (Table 3). First we note that ethnic differences in newspaper readership are largely explained by the covariates, leaving a marginally significant relationship with ethnicity ($.01 < P < .05$). No significant difference remains between Blacks and White Anglos, but a significant difference between Mexican Americans and White Anglos now shows Mexican Americans reading more newspapers regularly. While, as we found earlier, Mexican Americans read fewer papers on the average than White Anglos, they actually read more papers than White Anglos with comparable age and social stratification characteristics. The difference is probably attributable to bilingual readership in some Mexican American households. If newspaper readership is an indicator of exposure to news and interest in current events, ethnic differences must be explained on the basis of life situation rather than subcultural heritage. If limited exposure to news explains limited earthquake awareness, this is a problem to be approached

TABLE 3

PERSONAL CHARACTERISTICS AND COMMUNITY ATTACHMENT

BY ETHNICITY WITH AGE AND STRATIFICATION CONTROLLED

Characteristic and attachment	Significance of ethnicity (F test)	Standardized regression coefficients	
		Black	Mexican American
Newspapers read regularly	.024	--	.082*
Community attachment			
Home ownership	.267	--	--
Group involvements	.612	.073	--
Relatives in 3-mile radius	.012	.102*	.128*
Household composition			
One male adult, no children	.024	--	--
One female adult, no children	.000	-.106*	--
One female adult, one or more children	.000	.152*	--
Two or more adults, no children	.019	-.075*	--
Two or more adults, one or more children	.000	--	.149*

*An asterisk identifies a regression coefficient that is significant at or beyond the one percent level. Coefficients without asterisks are significant at the five percent level.

on the basis of differences between age groups and social strata rather than as a specifically ethnic problem.

We have chosen the three most analytically distinctive components of community attachment for separate examination. Differences in home ownership are fully explained by the covariates. The relationship between ethnicity and group involvements similarly vanishes, except that Blacks may have slightly more group involvements than White Anglos from similar age groups and social strata. This difference is probably explained by Black participation in church activities. But relationships between ethnicity and the presence of relatives living within a three-mile radius remain. Both Blacks and Mexican Americans, and especially Mexican Americans, more often than White Anglos, have relatives living nearby.

Household composition for the three groups has been compared by recording the relative frequencies for each of five possible combinations of adults and children. The sixth combination, of one male adult with one or more children, is too infrequent for inclusion in the analysis. It is clear that differences in household composition persist after the four age and stratification covariates are controlled. Households consisting of one female adult with one or more children are distinctively more frequent among Blacks, offset by fewer households consisting of an adult female living alone without children or of two or more adults without children. Households consisting of two or more adults living with one or more children are distinctively more common among Mexican Americans, with offsetting differences distributed among the remaining household types. Thus whatever the origins of these patterns have been, the differences now transcend the current differences in age and social stratum. It is plausible that these differences have acquired roots in the respective ethnic subcultures.

TABLE 4

FATALISM AND INVULNERABILITY BY ETHNICITY

WITH AGE AND STRATIFICATION CONTROLLED

Attitude	Significance of ethnicity (F test)	Standardized regression coefficients	
		Black	Mexican American
Fatalism index	.000	.157*	-.064
"I believe earthquakes are going to cause widespread loss of life and property whether we prepare for them or not."	.000	.134*	--
"If I make preparations for an earthquake, I am almost certain they will work."	.000	.102*	-.097*
"There is nothing I can do about earthquakes, so I don't try to prepare for that kind of emergency"	.000	.091	-.066
"The way I look at it, nothing is going to help if there were an earthquake."	.000	.118*	--
Invulnerability: "I don't believe an earthquake could really harm me."	.000	-.094*	.088*

*An asterisk identifies a regression coefficient that is significant at or beyond the one percent level. Coefficients without asterisks are significant at the five percent level. For each of the four fatalism questions, regardless of the wording, the signs on the regression coefficients are applied so that a negative sign means that the ethnic group is less fatalistic than the White Anglo control group.

The reason for examining these "background" variables has been to ascertain which ones should be retained and which ruled out as possible explanations for any remaining difference in earthquake awareness and response variables. Newspaper readership, home ownership, and group membership can now be ruled out. But involvement in the community through nearby relatives and differences in household composition remain as possible explanatory variables.

Significant orientations. One of the more interesting differences we uncovered in making uncontrolled ethnic comparisons concerned fatalistic attitudes toward earthquake danger. After the four covariates have been incorporated into the analysis, the differences remain, much as before (Table 4). Blacks are distinctively more fatalistic about earthquake danger than White Anglos, and Mexican Americans are somewhat less fatalistic than White Anglos. If we examine the four items that make up the fatalism index, Blacks are consistently and significantly more fatalistic on all items. The two items that principally account for Mexican Americans' less fatalistic score both reveal the ethnic group's greater confidence in the effectiveness of individual preparations. Mexican Americans, more than Blacks or White Anglos, believe there are things an individual can do that will be effective in the event of an earthquake. Similarly, while very few respondents in any of the groups will claim invulnerability to earthquakes, Blacks continue to be most emphatic in denying invulnerability and Mexican Americans least emphatic.

The ethnic differences in favorability toward science and scientists persist when age and stratification are equalized (Table 5). Blacks remain least favorable and White Anglos most favorable, with Mexican Americans expressing an intermediate view. In the controlled analysis, Mexican Americans no longer differ significantly from White Anglos in the proportions who have ideas about the causes of earthquakes or who ascribe earthquakes exclusively to naturally occurring physical causes, nor in the accuracy they ascribe to scientific

TABLE 5

ORIENTATIONS TOWARD SCIENCE, FORETELLING EARTHQUAKES, AND TRUST BY ETHNICITY WITH AGE AND STRATIFICATION CONTROLLED

Attitude and belief	Significance of ethnicity (F test)	Standardized regression coefficients	
		Black	Mexican American
Attitudes toward science:			
Favorability toward science	.000	-.144*	-.075
Has idea about causes of earthquakes	.000	-.146*	--
Naturally occurring physical causes versus all other causes for earthquakes	.000	-.113*	--
Scientific prediction now	.634	--	--
Scientific prediction infuture	.000	-.177*	--
Earthquake signs in daily life:			
Unusual animal behavior	.000	-.175*	--
Unusual weather	.000	.128*	.077
Premonitions, instinct, ESP	.869	--	--
Unusual aches or pains	.018	.084	--
Prediction belief pattern:			
Believer	.599	--	--
Strictly scientific	.000	-.118*	--
Antiscientific	.003	.101*	--
Skeptic	.000	.157*	--
Are scientists and public officials holding back information?	.028	.079*	--

*An asterisk identifies a regression coefficient that is significant at or beyond the one percent level. Coefficients without asterisks are significant at the five percent level.

earthquake prediction now or in the future. On the other hand, Blacks of equivalent age and social stratum are less likely than White Anglos to have some idea of the causes for earthquakes, to ascribe earthquakes exclusively to naturally occurring physical causes, and to expect accurate scientific prediction of earthquakes in the future.

Similarly, most of the differences between Mexican Americans and White Anglos in acceptance of earthquake signs in daily life and in the generalized prediction belief typology disappear when the controls are introduced. Only a marginally significant difference in acceptance of unusual weather as an earthquake sign remains. Considerable differences between Blacks and White Anglos remain, however. Blacks are skeptical of animal behavior, but accepting of unusual weather and possibly of unusual aches and poins. They are less often strictly scientific and more often antiscientific or skeptical in their generalized prediction belief pattern.

As before, more Blacks than either Mexican Americans or White Anglos suspect that scientists and public officials are holding back information on earthquake predictions.

For this group of variables involving orientations toward science, faith in scientific and nonscientific prediction, and trust in the openness of authorities in telling what they know about earthquake predictions, there are very few differences between Mexican Americans and White Anglos of comparable age and social stratum. Mexican Americans are possibly a little less favorable toward science and possibly a little more accepting of unusual weather as an earthquake sign. Differences between Blacks and White Anglos, on the other hand, remain pervasive. There is a generally less favorable attitude toward science and a generally greater skepticism about foretelling earthquakes by any technique. While fewer Blacks have confidence in future

TABLE 6

PATTERNS OF COMMUNICATION BY ETHNICITY

WITH AGE AND STRATIFICATION CONTROLLED

Pattern of Communication	Significance of ethnicity (F test)	Standardized regression coefficients	
		Black	Mexican American
Number of media sources	.016	-.077	--
Chief source of information about prediction announcements:			
Television	.011	.078*	--
Radio	.888	--	--
Newspapers	.024	-.060	--
Friends, neighbors, and coworkers	.470	--	--
Talked about earthquake possibility	.000	-.184*	-.061
Range of earthquake topics discussed	.001	-.100*	--
Range of discussion partners	.000	-.172*	--
Folk expert in circle friends	.040	-.075	--
Reliance on media and discussion:			
Exclusive reliance on media	.000	.176*	--
Discussion supplementing media	.000	-.128*	--
Disproportionate reliance on discussion	.164	-.056	--

*An asterisk identifies a regression coefficient that is significant at or beyond the one percent level. Coefficients without asterisks are significant at the five percent level.

scientific earthquake prediction, more Blacks also suspect that what information authorities do have about predictions is being withheld from the public.

Patterns of communication about earthquakes. In the series of items dealing with disposition to commuicate and patterns of communication concerning earthquakes and earthquake hazard we find once again that most of the differences between Mexican Americans and White Anglos vanish when age and stratification are controlled, but that extensive differences remain between Blacks and White Anglos (Table 6). Less frequent discussion of the possibility of an earthquake occurring among Mexican Americans than among White Anglos of comparable age and social stratum is marginally significant. In other respects differences are not significant. Blacks, in contrast, have learned about earthquakes and earthquake safety from fewer media sources than White Anglos of similar age and social stratum and tend to rely relatively more on television and less on newspapers. Fewer Blacks have discussed the possibility of an earthquake occurring, and those that have discussed the possibility have done so with a narrower range of partners and covered a smaller range of specific topics. Fewer claim a folk expert among their friends. When communication patterns are looked at comprehensively, more Blacks rely exclusively on the media for information about earthquake matters, without supplementing and sifting media information through interpersonal discussion.

Earthquake hazard awareness, concern, and expectation. The pattern of similarity between Mexican Americans and White Anglos of equivalent age and social stratum applies to the number of kinds of predictive announcements heard and the relative seriousness with which different kinds are taken (Table 7). But significant differences remain between Blacks and the other two groups. Blacks have heard or remembered significantly fewer announcements. The announcements they remembered were significantly more likely to be vague general statements and significantly less likely to be announcements from identifiably scientific sources. While remembering fewer scientific announcements, Blacks

TABLE 7

EARTHQUAKE HAZARD AWARENESS, CONCERN, AND EXPECTATION

BY ETHNICITY WITH AGE AND STRATIFICATION CONTROLLED

Awareness, concern, and expectation	Significance of ethnicity (F test)	Standardized regression coefficients	
		Black	Mexican American
Number of announcements heard	.000	-.118*	--
Proportion of announcements heard that are:			
Scientific	.001	-.099*	--
General	.000	.101*	--
Pseudoscientific	.496	--	--
Prophetic	.895	--	--
Proportion taken seriously, of:			
Scientific announcements	.052	-.065	--
General announcements	.323	--	--
Pseudoscientific announcements	.478	--	--
Prophetic announcements	.093	--	.065
Awareness of the Uplift	.000	-.179*	-.091*
Fault within mile of residence:			
Know versus don't know	.001	-.065	--
Is versus is not	.627	--	--
Fear and concern idenx	.027	--	.073
Changed concern in past year	.015	-.085	--
Will be danaging earthquake in next year	.016	--	.090

*An asterisk identifies a regression coefficient that is significant at or beyond the one percent level. Coefficients without asterisks are significant at the five percent level.

also appear to be more skeptical of those they have heard, though they are no more skeptical than the other groups of general, pseudoscientific, and prophetic announcements.

When we ask specifically about the southern California Uplift , significantly lower levels of awareness persist for both Blacks and Mexican Americans as compared with White Anglos. The awareness deficiency is especially great for Blacks. A difference in how many people think they know whether there is a fault near their residence persists. But the difference in whether they think there is or is not ceases to be significant.

After age and social stratum are controlled, the higher Mexican American fear of impending earthquakes and their higher expectation for a damaging earthquake within a year persist, though the differences are no longer so striking as before. In these respects Blacks are no longer significantly different from White Anglos. However, Mexican Americans are no more likely than their White Anglo age and social stratum peers to percieve that their concern over a coming earthquake increased during the previous year, while Blacks are significantly less likely to have perceived such a change in their attitudes.

Mexican Americans have the same general awareness of public announcements concerning earthquake prospects as White Anglos of equivalent age and social stratum, though they are less aware of the more specific news about the Uplift. Although they are more convinced that an earthquake is imminent and more fearful of it, they are no more disposed than White Anglos to attribute their concern to recent events. Blacks, on the other hand, are no more fearful of coming earthquakes and have no higher expectation of an earthquake than White Anglos. They have consistently heard less about the earthquake prospect, especially from scientific sources, taken scientific announcements less seriously, and less often say that their concern has increased within the past year.

TABLE 8

ATTITUDES TOWARD PUBLIC RELEASE OF EARTHQUAKE PREDICTIONS

BY ETHNICITY WITH AGE AND STRATIFICATION CONTROLLED

Attitude toward release	Significance of ethnicity (F test)	Standardized regression coefficients	
		Black	Mexican American
How certain before public announcement?	.411	--	--
When should prediction be made public, if 50-50 chance?	.471	--	--
When should prediction be made public, if 90-100% sure?	.485	--	--
Who should release predictions: government officials alone versus other?	.036	-.065	--

*An asterisk identifies a regression coefficient that is significant at or beyond the one percent level. Coefficients without asterisks are significant at the five percent level.

The group differences reported earlier concerning the public release of earthquake predictions appear to have been largely a consequence of age and social stratum differences (Table 8). Blacks may be slightly less inclined than the other groups to entrust the release of predictions exclusively to government officials, but in other respects the three groups no longer differ in the disposition to release predictions or to delay their release.

Household and government earthquake preparedness. After adjustments were made for age and social stratum, significantly fewer Black households were broadly prepared for an earthquake (Table 9). Overall differences between Mexican Americans and White Anglos are fully explained by age and social stratum differences, however. But the specific Mexican American disinterest in earthquake insurance persists fairly strongly, and both Blacks and Mexican Americans are less likely than White Anglos to report having working flashlights available. Blacks less often have first aid kits and less often instructed their children.

Mexican Americans and White Anglos show similar levels of social and altruistic awareness, but Blacks show less awareness when age and social stratum are controlled (Table 10). However the group differences in advocacy of government spending to reduce earthquake hazard persist after effects of the covariates are controlled. Mexican Americans continue to favor spending for improved prediction and warning systems, while Blacks favor spending to increase building safety. Earlier we raised the question, whether Blacks and Mexican Americans favor government spending simply because they pay a smaller share of the taxes to support spending--or obversely that White Anglos oppose government spending because they pay more taxes. It is difficult to be sure that differences in economic level are fully controlled. However, with three socioeconomic variables controlled and fairly strong ethnic differences persisting, it seems unlikely that so simple an explanation could account for the differences.

TABLE 9

EARTHQUAKE PREPAREDNESS MEASURES BY ETHNICITY

WITH AGE AND SOCIAL STRATIFICATION CONTROLLED

Type of preparations	Significance of ethnicity (F test)	Standardized regression coefficients	
		Black	Mexican American
Earthquake preparedness index	.004	-.093*	--
Collective planning index	.701	--	--
Have working flashlight	.001	-.088*	-.089*
Working battery-operated radio	.308	--	--
First aid kit	.002	-.103*	--
Inquired about earthquake insurance	.007	--	-.153*
Bought earthquake insurance	.008	--	-.141*
Instructed children what to do during earthquake	.018	-.075	--
Family plans for emergency during earthquake	.578	--	--
Family plans for reunion after quake	.446	--	--

*An asterisk identifies a regression coefficient that is significant at or beyond the one percent level. Coefficients without asterisks are significant at the five percent level.

TABLE 10

SOCIAL AWARENESS AND ROLE OF GOVERNMENT IN EARTHQUAKE HAZARD

BY ETHNICITY WITH AGE AND STRATIFICATION CONTROLLED

Awareness and government role	Significance of ethnicity (F test)	Standardized regression coefficients	
		Black	Mexican American
Awareness of groups at risk	.000	-.122*	--
Breadth of social awareness	.000	-.121	--
Meliorability of risk	.778	--	--
Importance of government spending for all hazard reduction purposes	.000	.061	.131*
Importance of government spending for building safety	.002	.093*	.079
Importance of government spending for prediction and warning	.000	--	.140*
Number of suggestions for government action	.478	--	--
Type of suggestion for government action:			
Structural safety	.000	--	.086*
Education	.027	--	.058*
Emergency care and relief	.014	--	.060*
Scientific research	.024	-.045	-.046
Evaluation of government preparedness	.157	--	.066

*An asterisk identifies a regression coefficient that is significant at or beyond the one percent level. Coefficients without asterisks are significant at the five percent level.

Differences in the kinds of suggestions for government action offered by Mexican Americans and White Anglos persist, with Mexican Americans more often suggesting public education and preparation for emergency care and relief, and less often proposing measures to improve structural safety or sponsor scientific research. Blacks are like Mexican Americans in less often suggesting scientific research, but in other respects are similar to White Anglos of equivalent age and social stratum. Differences between Black and White Anglo evaluations of government preparedness disappear when the covariate effects are controlled, but Mexican Americans continue to express a more favorable evaluation.

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CHAPTER SEVEN

CONCLUSIONS

We have dealt with ethnic and racial similarities and differences in great detail and tried to separate those that are simply consequences of age distributions and placement in a system of social stratification from those that are part of the group culture. We return now to the categories of response presented in the opening chapter in an effort to reduce the detail to a smaller number of more comprehensive observations and to restate the response to earthquake warnings as an expression of the group's more broadly based orientation to society.

Intragroup heterogeneity. Certain caveats must be kept in mind. First, it is well nigh impossible to compare group characteristics without creating a false impression of intragroup homogeneity. In a very few instances such as the attachment of Mexican Americans to the Catholic Church and Blacks to the Baptist Church we are speaking of modal patterns that approach mutual exclusivity. But in most instances we are locating strictly distributional differences. All of the attitudes and patterns of behavior found in one group are also found in each of the other groups, but with varying frequencies. Usually the preponderant pattern, such as belief in the eventual prediction of earthquakes by scientists and reliance on television as the chief source of information about earthquake forecasts and near predictions, is the same for the three groups. The groups differ in how preponderant the pattern is and in the proportions of members who exhibit the less prevalent alternative patterns. Failure to keep this observation in mind in other contexts has contributed to the unproductive controversy generated by discussion of the excess of female-only-headed households among Blacks. While this pattern has been extensively confirmed and persists, as our data show, when stratification variables are controlled, it applies only to a larger minority of Blacks than of White Anglos or Mexican Americans. The majority of Blacks share in the household patterns that are

conventional for their age and sex. But even when the groups differ in modal patterns, there is usually more overlap than distinctiveness among the three distributions.

Why, then, do we make group comparisons at all? There is both an immediately practical reason and a theoretical reason which has practical implications. From the perspective of immediate practicality, the reason for examining ethnic groups and other special populations separately is to find out how to reach substantial minorities in these groups who cannot be helped effectively by customary procedures. Hazard reduction and emergency plans designed to help the typical individual in the typical situation leave substantial numbers of differently situated people without sufficient help. By knowing that a certain variant pattern is concentrated in a particular ethnic or racial group, policy implementers can work with the resources in that group to deal with their special problem.

From a more theoretical perspective we are often justified in viewing distributional differences as clues to pervasive tendencies that affect most members of the group in some degree. To the extent to which the ethnic or racial group constitutes a social unit, members are disproportionately affected by other members of their own group. Thus even though many Blacks do not share the disproportionate skepticism about earthquake prediction, they may be exposed to more declarations of skepticism than comparably placed Mexican Americans are. The resulting augmented awareness of skeptical views may affect the conviction with which less skeptical views are held and may affect the way in which personal conviction is converted into action. The patterns that are disproportionately concentrated in a particular group can become part of the distinctive social context for members who do not share the pattern themselves.

The shared tendency may be more internalized than this. Negative

attitudes toward civic authority appear to be more frequent among Blacks than among Mexican Americans, though the majority of Blacks seem to accept that authority. But attitudes like this are matters of degree. Because of the experience of discrimination and tensional encounters with authority by Blacks at all social levels, the accepters of civic authority may be more ambivalent than accepters from other groups. Accordingly, the difference of a few more people expressing negative attitudes toward authority may be seen as the indicator of a relatively pervasive difference in the degree to which authority is accepted unambiguously.

The practical implication of the possibility that distributional differences can signify more pervasive social contexts or individual tendencies is to alert policy makers and implementers to the fact that the visible problem is often merely the tip of the iceberg. In some instances the most effective strategy will be to seek out and deal just with the evident problem situations. In other instances the more effective strategy will be to deal with the group as a whole.

Accidental associations. A second caveat applies to the interpretation of findings from the analysis of covariance. We are usually justified in attributing differences between groups that disappear under analysis of covariance to the effects of social stratification and age differences. But we must look at each of these effects perceptively in order to avoid interpretations that do not make sense. The case of earthquake experience is interesting. Most of the differences vanish when age and social stratification are controlled. The principal reason appears to be that older people have had a longer time in which to experience earthquakes in their more intense and personal impact. But there is also a socioeconomic contribution that is more difficult to understand. It is implausible that low status protects against earthquake experience and loss in any general way. Instead we must look for the possibility of accidental associations. Both indexes of earthquake experience require

the experience of a destructive earthquake for assignment of the highest scores. But there were only three such quakes in the Los Angeles region during the 44 years prior to our interviews. The most recent one should have been felt throughout the County, but was destructive only in the San Fernando Valley to the north and west of the population center. The next preceding destructive quake was centered in Tehachepi and Bakersfield far to the northwest, and was consistently felt only in the San Fernando Valley and adjacent areas. Since the Second World War minority racial and ethnic populations have been concentrated south and east of the population center in what have also been lower socioeconomic regions. Compton and the surrounding region to the south, now predominate Black, was a White Anglo community in 1933 at the time of the Long Beach-Compton earthquake. Thus historical accident has made destructive earthquakes disproportionately a White Anglo experience during the lifetimes of most of our respondents. If the Long Beach-Compton disaster were repeated today, Blacks would share more extensively in its impact. Accordingly it would be inappropriate to treat the connections between socioeconomic status and earthquake experience and ethnicity and earthquake experience as anything but accidental.

The framework for collective response. The preliminary framework offered in Chapter One was intended to enable us to see response to an earthquake warning as an instance of the more general problem of dealing with information about uncertain risk that affects the entire community. Knowing about the risk at all depends first on involvement in some kind of communication system. Confirming, interpreting, weighing, and elaborating the warning likewise depend upon involvement in communication. Communication patterns differ among groups in both their objective and their subjective components. Communication systems are often indistinguishable from support systems since we often look to the same sources for information and support. By support systems we mean the pattern of resources available for help and collective action in the face of

difficulty. A support system is a mutual arrangement for both receiving and giving help. Whether individuals act alone or depend upon extended support systems, they are likely to follow customary patterns for dealing with risk and uncertainty. These patterns incorporate relatively secularized or non-secularized approaches, orientation according to particular time dimensions, and varying degrees of hopefulness and pessimism. Finally, because of the community-wide impact of the threat, attitudes toward the social and political establishment and to authority in general have much to do with shaping the group's response.

Black Culture and Social Structure

As we examine the distinctive characteristics of Black responses to our queries we must remember that on several occasions we found evidence of polarization into two Black communities. The large majority of Blacks are disproportionately in the lower educational and socioeconomic ranges. It is this contingent that accounts for the fact that the Black sample differs from Whites on a more comprehensive range of variables than the Mexican American sample, even though the stratification discrepancies are not so great. But the upper end of the Black distribution is sometimes indistinguishable from the upper end of the White Anglo distribution, indicating a smaller but substantial segment of "successful" and "assimilated" Blacks. Research in other communities has documented this bimodalization of the Black community. The comparisons we report apply principally to the larger rather than to the smaller contingent.

Communication. Although Blacks have a "race" newspaper in Los Angeles, very few in our sample read the Sentinel and it does not attempt to satisfy the need for a comprehensive newspaper as La Opinion does. About the same proportion of Blacks as White Anglos read Los Angeles' principal paper, the Times, but more read the second paper, the Herald Examiner, and many fewer read community papers. While fewer Blacks read any newspaper regularly, this

difference is fully explained by age and social stratification differences. Blacks differ from White Anglos of comparable age and social stratum in gleaning earthquake information from a more constricted range of media sources and relying disproportionately on television and slighting newspapers for earthquake information. In general, Blacks begin the communication chain by using fewer media sources, leaning more heavily on the source that provides mostly brief and superficial information and less on the newspaper with its more extensive and searching reports, and missing the indications of localized relevance often supplied by the community newspapers.

At the second stage in communication Blacks are much less likely to than either Mexican Americans or White Anglos with similar age and social stratification characteristics to enter into discussion concerning the possibility of an earthquake occurring. What discussions they have are likely to be more limited as to topics and especially as to partners. Friends and neighbors rather than family members rank first as partners. With the covariates controlled Blacks are less likely to have someone in their circle of friends and associates that they consider especially knowledgeable about earthquakes. The low level of informal communication is not simply an extension of the limited exposure to media communication about earthquakes, but brings a qualitative difference to the communication pattern for many Blacks. Blacks are strongly distinguished from White Anglos and Mexican Americans with equivalent age and stratification characteristics by their exclusive reliance on the media, without the benefit of discussion to sift the messages and sensitize the potential receivers of media communication. Forty one percent of Blacks, compared with 29 percent of Mexican Americans and 21 percent of White Anglos, failed to use discussion to round out the communication process. The number who rely disproportionately on informal information sources and may therefore be especially

susceptible to rumor is nevertheless hardly fewer for Blacks than for White Anglos.

With communication limited in these ways it is not surprising to observe that substantially fewer Blacks than White Anglos of comparable age and social stratum are aware and appreciative of the southern California Uplift, and that Blacks remember fewer earthquake warning announcements. Of the fewer announcements they remember, Blacks take fairly similar proportions seriously. And in spite of remembering and taking seriously a smaller total number of announcements, Blacks are not significantly different from White Anglos in the number who expect a damaging earthquake within a year's time. Thus in spite of limited exposure to earthquake information from the media, compounded by less discussion, and reflected in less awareness of near predictions and forecasts, Blacks have assimilated the general message that a damaging earthquake is on the way to about the same extent as White Anglos. This means also that in more instances the belief that an earthquake is imminent is divorced from any specific details concerning the grounds for the expectation, or time, place, or magnitude of the anticipated disaster.

Support systems. If the family is usually the most intimate and accessible support unit in coping with risk and uncertainty, the number of Blacks living alone and therefore less closely integrated into a household or family support unit is not very different from the number of White Anglos similarly situated. There are probably fewer Black women living alone, but the greater number of males living alone may be fully explained by age and stratification differences. Of course, young males who are not house bound may be disproportionately missed in a survey of this sort, but the evidence we have would not give reason to believe that the underestimation was any greater for Blacks than for other groups.

However there may be differences in the ready accessibility of the family unit as a support system. First, smaller percentages of young and middle aged

Blacks are married and have thereby institutionalized their claim to support from a family of procreation. Second, older children in Black households are seldom involved in discussions of earthquake topics, suggesting that they may be peripheral to the effective household social unit. A further observation that fewer of the single-adult households are self-supporting economically may or may not be relevant. Compared to White Anglos this difference is probably explained by age and social stratification differences. But compared with Mexican Americans who appear to remain with the family of orientation until they are self-supporting there is apparantly a greater readiness to establish households that are not economically independent. If so, this observation may be a natural extension of the speculation that young Black adults--especially males--who remain in the parental household are not part of the integrated unit.

The clearest difference in family support systems is the greater prevalence of households with one female adult and one or more children. When the covariates of age and social stratification are controlled, the proportion of "conventional" units with two or more adults and one or more children is close to that for White Anglos. But there are fewer households with one female adult living alone and fewer two-or-more-adult households without children and in their place substantially more female-and-child households. The complexities of the debate over the dynamics of mother-and-child family units are sufficient to discourage rash conclusions about their effectiveness as general support systems. But is seems unlikely that children could usually provide the same kind of support in planning for a possible disaster or coping with disaster as other adults might do. Support might have to come disproportionately from outside, from an extended family network or from the community.

Blacks are more likely than White Anglos to have relatives living nearby, so the extended-family support system may compensate for limitations in the

nuclear unit. As compared with White Anglos from equivalent age and stratification brackets, Blacks report more group involvements in the immediate vicinity. Thus Blacks may have dual support linkages to the immediate community through both kinship networks and organizations. Their lower level of home ownership is strictly a function of age and stratification, and they are no less disposed than White Anglos to view the local community as their real home.

Of the three groups, Blacks assign religion the greatest importance in their lives. While they are not as homogenous in church affiliation as Mexican Americans, the concentration of over half of the Black respondents in the Baptist denomination establishes the potential for a comprehensive integrating support unit in the community. We suspect that the greater local organizational involvement of Blacks than either White Anglos or Mexican Americans reflects a fairly high level of participation in organized church activities. Since the churches are probably largely segregated, they undoubtedly go beyond the local community to contribute to the sense of an integrated racial community as a support system on another level. The very infrequent readership of the Black newspaper calls into question the importance of racial group identification as a factor in personal support orientation, however.

The nuclear and extended family and organized religious support systems we have described are potentially available as resources in dealing with risk and uncertainty, but the question remains, whether they have been used in dealing with the current earthquake threat. Blacks are like White Anglos in seldom making family emergency plans or family plans for post-quake reunion. But fewer adults in households with children have instructed them in what to do during an earthquake, as compared with White Anglos of equivalent age and social stratum. So far as neighborhood planning is concerned, Blacks report the same low level of activity as White Anglos.

The idea of the community as a <u>mutual</u> support system in time of risk

or disaster is approached by looking for awareness of groups who are exceptionally vulnerable in case of earthquakes and who might require help from the community. In this respect Blacks show considerably less social awareness and altruism. Substantially more Blacks than White Anglos of equivalent age and social stratum fail to recognize or concern themselves about vulnerable groups.

Looking at communication and support systems together, although Blacks have acquired the same sense of earthquake imminence as White Anglos, and have nuclear family, extended family, and church support systems that in balance may be as effective as White Anglo systems, the earthquake threat has not been equally incorporated into the communication and support systems of Blacks, and the groundwork development of social sensitivity necessary for involving Blacks into a community-wide earthquake support system has yet to be done.

Customary patterns for dealing with risk and uncertainty. The character of risk and uncertainty depends upon the time perspective in which they are viewed. Time perspectives are sometimes revealed by differing intensity of feelings concerning objects in differing temporal relationships to the experience Both Blacks and Mexican Americans seem to be less blasé than White Anglos about earthquakes. But Blacks admit to being more frightened of earthquakes they have already experienced than Mexican Americans, while the reverse is true of fear and concern about earthquakes in general and in the future. These differences can plausibly be interpreted as indicating that the strongest orientation among Blacks is toward the present and that future orientation is weaker. Although the evidence is mixed, Blacks in general are more skeptical about the possibility of foretelling the future, at least so far as earthquakes are concerned. With age and stratification covariates controlled, substantially more of them are classified as skeptics who believe in neither scientific nor non scientific grounds for forecasting earthquakes. They are as likely as equivalently bracketed White Anglos and Mexican Americans to overestimate

the present ability of scientists to predict earthquakes, but fewer of them express confidence in the eventual achievement of accurate prediction and they are especially skeptical of foretelling earthquakes on the basis of unusual animal behavior. Blacks also express less faith in the possibilities of managing the future, as indicated by substantially more fatalistic attitudes. Blacks give significantly more fatalistic responses to all four of the fatalism items than equivalently bracketed White Anglos. And they reject the idea of personal invulnerability more emphatically. Nevertheless they are as willing as equivalent White Anglos to have earthquake predictions released, and released without delay.

With this type of present time orientation, Blacks should not be especially concerned about earthquake prediction or dealing with earthquake hazard. But insofar as they are concerned they lean toward the use of nonscientific rather than scientific instrumentalities. They are significantly more often antiscientific and significantly less often strictly scientific in their prediction belief patterns than White Anglos of equivalent age and social stratum. The pattern of skepticism about science is consistent. Blacks express less favorable attitudes toward science in general terms, fewer say they have any idea about why earthquakes occur, and fewer of those that have ideas give only naturally occurring physical causes. In addition, when asked for suggestions for government action to reduce the hazard from earthquakes, they less often suggest scientific research.

The lesser concern about earthquake threat appears to be translated into less personal and household preparedness than is reported by equivalently bracketed White Anglos. This deficit might be attributed to lack of information, caused by restricted involvement in earthquake communication. But two of the component measures on which Blacks differ most strongly are possession of a first aid kit and having a working flashlight. Neither of these items is more relevant to

earthquakes than to other major and minor emergencies, so the low level of preparedness is more likely a symptom of a generally applicable weak future orientation and lack of faith in the manageability of the future.

One item that seems not to fit the general picture is the strong support by Blacks for spending large amounts of public money on building safety. We noted earlier that many of the old masonry buildings are concentrated in Black neighborhoods and that the racial connection has been publicized in the political arena. The immediacy of this problem may have been sufficient to overcome the limited orientation to the future.

Attitudes toward the social and political establishment and toward authority in general. The less favorable attitudes toward science that we have described may be part of a more general attitude toward established groups and authority in society. Blacks are more likely than White Anglos of equivalent age and social stratum to believe that scientists and public officials are withholding information about earthquakes from the public. But Blacks also distinguish more strongly between officials and scientists, expressing more suspicion of the former. Blacks also less frequently favor giving the responsibili for releasing predictions exclusively to government officials. However, when Blacks are compared with equivalently bracketed White Anglos, they offer similar numbers of suggestions for government action and are no more negative in their evaluation of government efforts to reduce earthquake hazards. And when it comes to government spending for earthquake hazard reduction, they are more supportive. This difference does not extend to spending for earthquake prediction and improved warning systems, but is a consequence of their support for spending on building safety.

These few findings suggest a widespread ambivalence toward government in the Black community. Blacks apparantly look toward government to deal with the problem of earthquake hazards. But at the same time they have reservations

about trusting government officials fully. Their evaluations of government accomplishments are neither strongly positive nor strongly negative, suggesting a limited degree of personal engagement with the problems of government.

A Black culture? Blacks exhibit a wide range of differences from White Anglos of equivalent age, education, occupational standing, and household income. These differences cannot be simply explained by the current Black life situation. Yet we hesitate to use the term racial culture to describe such characteristics as limited interest in matters of general concern to the community, skepticism about the predictability of the future and fatalism about dealing with risk, jaundiced attitudes toward science, and the ambivalent combination of dependence and distrust toward government. All these characteristics distinguish the Black population, even after the covariates have been controlled. But they are mostly characteristics of disadvantaged populations irrespective of race and ethnicity and appear in the Black population to a much greater degree than could be explained on the basis of their actual present situation. In this respect they offer a contrast to some of the distinctive characteristics of Mexican Americans that appear opposite to what could be expected on the basis of their socioeconomic distribution. In the latter case we are forced to look outside of the current life situation for an explanation and the concept of an ethnic culture seems appropriate.

Most of the differences manifested by the Black population could be explained if the life situation variables operated with a multiplier effect on Blacks. Such a multiplier effect could easily be explained in one of two ways. First, membership in an embattled minority racial group may be an element of disadvantage in addition to the tangible disadvantages of education, occupation, and income. Or second, the effect of living under disadvantaged conditions for several generations, or even a less extended period, causes the derivative conceptions and attitudes to be assimilated into the folk knowledge that is

transmitted within a self-conscious minority. These folk attitudes and conceptions then become an orienting but partial subculture, entrenching the effects of the life situation more widely and deeply in the population than would otherwise be the case. It is in this second sense that we suggest that these differences between Blacks and equivalently bracketed White Anglos be viewed as manifestations of a partial orienting racial subculture. They can be expected to respond to changes in life situation, but more slowly than they would if the partial orienting subculture were not in effect.

Mexican American Culture and Social Structure

We do not find as frequent indications of bimodalization in the Mexican American sample as we do among the Blacks. This is surprising in light of the distinct waves of migration, with heavy recent migration to Los Angeles County impacting on a community whose roots go back for a relatively extended period. It is possible that the Mexican American community is sufficiently effective in integrating newcomers into the established community structure to prevent the development of sharply distinguishable subpopulations. The task of integration may also be inherently more simple when less assimilated newcomers are received by more settled and assimilated residents from a common national origin than when the separation results from the growing away of a newly successful subpopulation from the less successful majority.

Communication. We begin by noting that Spanish is the principal language used in about half the Mexican American homes. While many from Spanish-speaking homes read La Opinion, which gives a Latin American slant to the news and slights earthquake prediction and safety in southern California, English-language papers are also widely read. Compared to White Anglos of similar age and socioeconomic standing, Mexican Americans compensate by reading slightly more papers, without neglecting English-language community newspapers.

Differences in the use of media are principally attributable to age and social stratification, as are differences in the use of discussion to supplement or supplant the media. Because of relative youth and depressed social status, but not because of ethnic culture, Mexican Americans may be a little more susceptible to rumor through greater reliance on interpersonal sources of information. Mexican Americans may discuss earthquake prospects a little less frequently than their age and stratification counterparts, but the important difference is the greater concentration of discussion of earthquake matters within the family. By observing that Mexican Americans do not name family members as authority sources for prediction information more often than other groups, we are assured that extended family discussion does not create a walled-in unit, but provides a rich setting for commentary on the media. The discussion of earthquake topics is primarily among adults and older children, with younger children apparently either sheltered or not taken seriously as countributors to such discussions.

In general the level of effective exposure to both media and informal discussion of earthquake topics in the Mexican American community is lower than it is in the White Anglo community because of age and stratification differences, but not because of ethnic culture. Ethnic culture accounts for greater use of the family as the crucible in which media communications are interpreted, and for a somewhat more age-graded pattern in family discourse. If the schools were playing a significant role in communicating earthquake safety information--which they were not at the time of this investigation--the age grading could weaken one important communication link from outside the family. Any serious culturally induced deficit in receipt of earthquake information would have to be explained by the selective treatment of earthquake topics in the Spanish-language media, and the possibility that the family as the principal arena for

sifting news may impose preformed and unduly homogeneous interpretations on communications from outside.

Fewer Mexican Americans than White Anglos have heard of the Uplift, and Mexican Americans remember fewer predictive announcements. The latter difference is fully explained by stratification variables, but the former remains in spite of both age and stratification effects. This combination of findings is consistent with a conclusion that nothing in the ethnic culture insulates Mexican Americans against earthquake forecasts and near predictions, but that the deficit in attention to the Uplift in La Opinion has had a measurable effect on community-wide awareness. But Mexican Americans probably take what they hear more seriously, more often giving credit to predictive announcements and assuming that the Uplift means damage where they live. Taking warnings seriously is translated into more frequent expression of the conviction that a damaging earthquake is imminent. But the conviction is not necessarily rooted in remembering specific information: the number of Mexican Americans who expect a damaging earthquake within the year but could not recall a specific forecast or near prediction that they took seriously is disproportionately high. This disposition to take the sense of warnings seriously, without necessarily assimilating detail, may well be rooted in Mexican American culture and social structure. If so, it constitutes an important conditioning factor on the receiving end of the communication chain to the ethnic community. And it is also found in an otherwise fairly different Black culture.

Support systems. Just as the family plays a special part in the communicati process, the family is preeminent in the Mexican American's support system. Fewer Mexican Americans live alone, or in households with fewer than two adults. They marry younger and live in larger households, more often including school children. More of the households are economically self-sufficient as indicated by the presence of a wage earner, most commonly the male identified as household

head. A traditionally constituted family household is more generally available to Mexican Americans than to either Blacks or White Anglos as the fulcrum for their support systems. In addition, they are more likely to have other relatives living nearby to whom they can turn than either Blacks or, especially, White Anglos.

While the availability of strong family support units is widespread, and families are important in sifting earthquake communication, specific earthquake support activities are no more common in Mexican American than in White Anglo households. Mexican Americans and White Anglos are similar in the extent to which they have instructed children in what to do in case of an earthquake and in the infrequency with which they have made family emergency plans or plans for post-quake reunion. Actually fewer Mexican Americans than White Anglo children have been instructed on earthquake survival by adults in their own households, but this difference is a consequence of socioeconomic standing rather than ethnic culture.

Mexican Americans feel no less attached to the local community in which they live than White Anglos. Less frequent home ownership, less permanence of residence,and less involvement in local organizations are strictly consequences of Mexican American's young age as a group and, to a lesser degree, of their economic standing. Their common identification with the Catholic Church, coupled with assigning more importance to religion in their lives, suggests an important source of support and integration as a group. We assume that an integrated ethnic community is a more potent resource for social support than an individuated group. Similarly, the existence of a well established Spanish-language newspaper that features items of special concern to the Latin community should contribute to integration in the ethnic community. However, the picture is not quite this clear. The low level of readership of La Opinion by Mexican Americans whose principal household language is English suggests that the paper

serves more as a practical way for people who are less comfortable with the English language to get the news than as a vehicle for perpetuating Latin culture and solidifying the total ethnic group. Similarly, identification with the Catholic Church is not translated into any unusual level of participation in locally based organized group activities, such as would be expected if the identification were more than symbolic. Hence while the Catholic Church affiliatio and support for a Spanish language newspaper are important resources, their contributions to maintaining as integrated supportive ethnic community may be more potential and symbolic than active at the present time. We return to the extended family as probably the best documented support unit beyond the walls of the individual household.

Again, identification with neighborhood and local community is not translated into support activities specifically concerned with the earthquake threat. Mexican Americans are similar to Blacks and White Anglos in the negligibl extent to which they have engaged in cooperative neighborhood planning to cope effectively in case of an earthquake.

Orientation to the larger community as a mutually supportive unit in dealing with earthquake hazard is less common among Mexican Americans than among White Anglos but the difference disappears when comparisons are made strictly between equivalently educated and socioeconomically situated sub-populations. So far as ethnic culture effects are concerned, Mexican Americans are neither more nor less disposed to appreciate the existence and needs of especially vulnerable groups of people. But the recognition of such groups is more often strictly altruistic among Mexican Americans than among White Anglos or Blacks, in the sense of referring to groups in which they do not include themselves. We pointed out the need to distinguish between topical awareness of earthquake danger and strictly social awareness or sensitivity in anticipating the potential for altruistic involvement in a mutually supportive community activity in case of emergency. When allowance is made for the low leve

of earthquake understanding among Mexican Americans, it appears that the potential for altruism is greater than it is among either Blacks or White Anglos. Informed and alerted to emergency needs, the Mexican American ethnic community may contribute more than its share to support activities in the encompassing community.

Customary patterns for dealing with risk and uncertainty. Dealing with risk and uncertainty depends initially on how the present and the future are experienced. The observation that Mexican Americans compared with Blacks express greater fear of earthquakes in general and in the future but remember being less frightened during earthquakes they have already experienced suggests a greater preoccupation with the future among Mexican Americans. They share with White Anglos a disposition to believe that the future is predictable and many express unjustifiable faith in the possibilites for prediction now. They seem to have greater faith than either Blacks or White Anglos in the manageability of the future as indicated by a lower level of fatalism about earthquake effects and a greater willingness to entertain the idea of personal invulnerability to earthquake effects. This combination of fear of future earthquakes and belief in manageability of the future is consistent with an ambivalence concerning the release of earthquake predictions. Mexican Americans are as favorable toward releasing predictions as White Anglos, but they more often advocate delaying release so as to shorten the period of besetting anxiety. This pattern of orientation toward the future, including the apparent belief in personal efficacy in dealing with earthquake risk, is one of the three realms in which Mexican Americans differ most strongly from Blacks. The fear of future earthquakes may be related to the dramatic awareness of a series of devastating earthquakes in Mexico and other parts of Latin America, and the lesser fear during past earthquakes may be explained by the contrast between the relatively benign local tremors and the great disasters to the south. The repudiation of fatalism and

the faith in prediction are all the more surprising in light of the Latin experience with earthquakes and must have its roots in Mexican American ethnic culture and social structure.

In looking for instrumentalities with which to predict and deal with risk Mexican Americans are especially eclectic, though not more so than others from the same socioeconomic strata. In balance, even after the covariates have been controlled, they are a little less favorable toward science and a little more accepting of the folk belief in earthquake weather and in prophetic forecasts of earthquakes. Otherwise, differences reflect life situation rather than ethnic culture and Mexican Americans are strikingly similar to their age and social stratification counterparts in the White Anglo community.

After correction is made for differences in age and stratification, Mexican Americans are no different from White Anglos in the extent to which they are prepared personally and as households for an earthquake. But they are strikingly less disposed to consider or use earthquake insurance as a device for dealing with earthquake threat. In this respect they diverge equally from both White Anglos and Blacks. What there is in the Mexican American culture or social structure that blinds them to the potential benefits of earthquake insurance merits careful investigation. We have no explanation. However we note a possible affinity between this finding and the tendency for Mexican Americans, who have more suggestions to offer for government action involving structural safety, education for earthquake safety, and emergency preparedness, less often to suggest support for scientific research than their White Anglo age and stratification counterparts. Both are relatively sophisticated approaches to earthquake threat that provide little in the way of visible immediate benefit in exchange for the expenditure involved. Perhaps these two findings belong with the finding of less favorable attitudes toward science and more acceptance of folk and prophetic forecasting as indicating the persistence of some elements of "folk"

in American society may exhibit contrasting social systems and orientations for dealing with shared risk and uncertainty.

Mexican American ethnic culture and social structure. The Mexican American community suffers some of the consequences of limited education, occupational status, and income, but not always to the degree to which we might expect these effects to be manifested. There appear to be working ethnic culture and social structure that offset some of these effects and foster a positive set of attitudes. These attitudes make the community reachable and potentially responsive and provide the ethnic community with support systems and resources that can be put to good use in dealing with the earthquake threat and with other situations of widespread risk and uncertainty. Because of the generally positive effects of the ethnic culture and social structure, it seems crucial that policy makers and policy implementers deal with problems of earthquake awareness and preparedness by working through the Mexican American social structure and by taking advantage of the cultural and structural resources available in the ethnic community.

or peasant mentality in the approach to understanding and dealing with the world of which risk and uncertainty are integral elements.

Attitudes toward the social and political establishment and to authority in general. In spite of a continuing theme of ethnic nationalism in the Mexican American community, research has rather consistently found that the prevalent attitudes toward authority and government in the United States are positive. Our findings lend confirmation to this conclusion. Mexican Americans are more often disposed to place responsibility for releasing earthquake predictions exclusively on government, but have fewer suggestions to offer for government action. But both of these differences reflect their age and social stratification rather than ethnic culture. However they are more positive than their White Anglo age and stratification counterparts about government spending for hazard reduction, especially for earthquake prediction and the development of earthquake warning systems. They are no more disposed to suspect that public officials and scientists are withholding information than White Anglos, nor do they trust government officials substantially less than scientists. And they offer a more positive evaluation of government efforts to reduce the hazard of earthquakes. In short, in spite of close ties to their own national heritage, they look to American government officials to deal with earthquake hazard and have a more favorable view of official accomplishments than either White Anglos or Blacks. And while their relatively low income and occupational status predispose them to support government spending, their level of support exceeds what would have been expected on these grounds.

The positive attitude toward government, though not the reliance on government, is the third major difference between Mexican Americans and Blacks. Combined with the greater availability of conventional nuclear and extended families as foci for communication and support systems and the disposition to view the future as both more predictable and more manageable, it underlines the extent to which minority groups so similar in their disadvantaged position

COMMUNITY RESPONSE TO EARTHQUAKE THREAT IN SOUTHERN CALIFORNIA

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PART SEVEN

VULNERABILITY ZONES AND EARTHQUAKE SUBCULTURE

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PART SEVEN

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CHAPTER ONE

THE NATURE AND SELECTION OF SPECIAL ZONES

Included in each of our surveys have been questions about prior earthquake experience and the vulnerability of the respondents' present situation. It is of both practical and theoretical importance to know whether people with more severe and personal prior earthquake experience respond to the prospect of a damaging earthquake in the near future differently from people with less experience. And it is also important to know whether people recognize the vulnerability or security of their situation and respond accordingly.

Besides taking these variables into account on a strictly individual basis, it should be helpful to look at them by areas in the metropolitan community. Sociological theories generally lead us to suppose that awareness, interest, and action are heightened when the individual lives in a neighborhood in which many other people have shared similar disaster experiences, or in which many others are subjected to a common hazard. Common experience and common hazard become mutually relevant topics for conversation. Because of the mutual interest, more information is circulated and more thought given to appropriate response. Recognizing the existence of a concerned constituency, organizational leaders and locally-based public officials incorporate these concerns into organizational and governmental life. If this entire process is sufficiently advanced, a <u>disaster subculture</u> develops, as described by Moore (1964) and Wenger (1978).

The Zones of Vulnerability and Experience

The most widely publicized source of special vulnerability in southern California is the danger that certain kinds of buildings constructed before 1934 will collapse in an earthquake. Prior to that year masonry structures were built without reinforcement, and wood frame and stucco homes were often not bolted to their foundations. Zones with unusually heavy concentrations of buildings constructed before 1934 should be recognized as areas of special risk in an earthquake. Hence we sought to identify the census tracts in which the largest proportions of structures were built before 1934, to constitute one zone of special vulnerability.

During the San Fernando earthquake of 1971, the Van Norman Dam was on the verge of collapsing for several days. While the water level behind the dam was being lowered, thousands of residents were evacuated from the zone of potential inundation. Subsequently the owners of all dams in California were required by state law to prepare inundation maps, identifying the zones of potential flooding in case of dam collapse. These maps were to be delivered to authorities in the respective counties so that appropriate evacuation plans could be incorporated into local emergency plans. A sample of residents living in these potential inundation zones constitutes our second zone of special vulnerability.

When we began to locate census tracts for inclusion in these zones of special vulnerability, we discovered, first, that a surprisingly large share of Los Angeles County residents live in potential inundation zones, and that there is considerable overlapping between the two kinds of zones. We eventually decided to group the relevant census tracts into three zones, namely, an <u>inundation</u> zone, an <u>old-buildings</u> zone, and a <u>combined hazard</u> zone including

tracts that were hazardous by both criteria.

Research dealing with other kinds of natural disaster has often identified prior experience with a disaster agent as a relatively powerful predictor of response to disaster warnings. Although most residents of the County have experienced earthquakes, few of them have experienced a disastrous earthquake from within the zone of major damage or threat. Only people living within the main impact area for the San Fernando-Sylmar earthquake of 1971 would have had such an experience in Los Angeles County during the past two decades. The main impact zone consists of the neighborhoods within which structures were destroyed or heavily damaged, and neighborhoods in which residents were evacuated until authorities could be certain that the Van Norman Dam would not collapse. Residents of the San Fernando earthquake impact zone constitute our fourth special sample.

Potential overlap between the vulnerability areas and San Fernando earthquake impact area could be a source of unclarity in the analysis. The decision was made to constitute the three vulnerability zones exclusively of census tracts falling outside of the San Fernando impact zone. Because of the large portion of the latter zone that could also be subject to inundation, it was not judged practicable to constitute the San Fernando earthquake impact zone exclusively of tracts that were not vulnerable by our criteria. Hence the San Fernando earthquake impact zone includes neighborhoods potentially subject to inundation. However, a sufficiently large control group for comparative purposes could easily be constituted from tracts that did not fall into either the potential vulnerability zones or the San Fernando earthquake impact zone.

The potential vulnerability zones will be examined first. By determining first how residence in a potential vulnerability zone without recent experience

of severe earthquake damage affects awareness and response, we can decide whether and how to take vulnerability into account in later examining the sample of residents from the San Fernando earthquake impact zone.

In the remainder of this chapter we shall deal with the more technical questions involved in actually selecting the census tracts for inclusion in the sampling frames for the four special zones, and the procedures for over-sampling so as to insure sufficiently large samples in each category. The general reader may wish to skip this discussion and proceed directly to Chapter Two.

Identifying the Special Zones

Old buildings zone. The first step in identifying the old buildings zone was to determine the location of pre-1934 buildings in Los Angeles county. Although this precise information is not available, data are available with which to calculate the percentage of housing units constructed before 1939 in each census tract in the Los Angeles-Long Beach SMSA (Population and Housing, US Bureau of the Census, 1970). A decision was made to classify tracts in which at least 25 percent of all housing units were of pre-1939 vintage in the old buildings zone. Additional information with which to identify the old buildings was provided by a 1973 Los Angeles County Department of Building and Safety survey which mapped the number and location of potentially earthquake hazardous buildings in unincorporated areas within Los Angeles county. The respective median percentages of pre-1939 housing units for the control and old buildings zones are .06 and .39.

Inundation zone. Census tracts subject to potential flooding in case of dam collapse were pinpointed by the use of inundation maps obtained from the Office of Emergency Services.

Combined hazard zone. Tracts which both contain relatively large numbers of old buildings and risk inundation in the event of dam collapse constitute the combined hazard zone.

San Fernando earthquake impact zone. Tracts in the area most heavily damaged by the San Fernando earthquake were identified from an Institute for Social Science Research report by Bourque et al (1973) entitled The Unpredictable Disaster in a Metropolis: Public Response to the Los Angeles Earthquake of February, 1971. These included both the zone of heavy damage and the zone from which all residents were evacuated until water in the Van Norman Dam could be reduced to a safe level.

Oversampling Procedure

Thirty-eight census tracts containing 810 households in the LAMAS sampling frame used for the basic field survey fell within the control zone, while 41 census tracts containing 946 households constituted the potential sample from the old buildings zone. Thus there was no need to oversample from these zones to ensure sufficient numbers of respondents for the comparison. However, the small number of tracts (and hence households) in the basic field survey sample in the San Fernando earthquake impact zone, the inundation zone, and the combined hazard zone necessitated oversampling within those areas. A total of 173 households were sampled and 186 were oversampled from the San Fernando earthquake impact area. The inundation and combined hazard areas together netted a total sample of 137, necessitating an oversample of 140. The latter calculation was made before it had been determined that the combined hazard tracts would have to be treated as a separate zone.

The number of tracts and non-oversampled and oversampled respondents who completed the interview are shown here:

Zone	Number of Tracts	Nonoversampled Respondents	Oversampled Respondents	Total
Control	38	503	--	503
Inundation	7	95	30	125
Combined hazard	12	155	44	199
Old buildings	41	542	--	542
SF earthquake impact	7	90	110	200
Total		1385	184	1569

In order to determine whether random and oversampled respondents within each zone could be treated as one group, t-tests were run on 21 major variables to check for significant differences of means. An F-test was also used to check for equal variances in connection with the t-test. Its object is to determine whether one should use a t-statistic which assumes a pooled variance estimate or an adjusted t-statistic which corrects for separate variances.

The t-tests indicate that random and oversampled respondents in the San Fernando impact zone differed on only one variable. Oversampled respondents mentioned significantly more groups at greater risk from earthquakes.

T-tests for the two groups in the combined hazard zone yielded similar results. Earthquakes are more salient to oversampled respondents, who report a greater likelihood that an earthquake will occur within a year.

No significant differences between the random and oversampled respondents in the inundation zone were found.

Because the random and oversampled groups within each of the three special zones were essentially similar, they were combined for further analysis.

Weighting Procedure

As stated above, it was not necessary to oversample tracts in the control and old buildings zones in order to ensure sufficient numbers of respondents for the zonal comparison. However, tracts in the San Fernando impact, inundation, and combined hazard zones were oversampled. Because of their greater

probability of selection, respondents in the oversampled areas assume an artificially inflated importance statistically for which it is necessary to make an adjustment. To correct for their greater selection probability, respondents in the San Fernando impact zone, the inundation zone, and the combined hazard zone were multiplied by a weight factor less than one. Weights were computed on the basis of the increased probability of selection because of oversampling, and are .509, .744, and .744, respectively. Respondents in the control and old buildings zones, where no oversampling occurred, were multiplied by one. However, by itself, this procedure would have the effect of decreasing the number of cases in oversampled areas in proportion to the multiplier. Therefore, it was necessary to divide by a constant in order to return the sample to its original size. This constant is simply the mean of the weight factors of all respondents. When all groups are included in the analysis, the constant for the interzonal comparison is .887. The effect of dividing by this number is to decrease the size of the oversampled groups relative to their original size but to inflate the size of the non-oversampled groups. The following table illustrates the procedure:

Area	Weight Factor	Mean of the Weight Factor Variable	Original Sample Size	Weighted Sample Size
SF Damage	.509	.887	200	114
Inundation	.744	.887	125	106
Combined hazard	.744	.887	199	172
Pre-1934	1.000	.887	542	610
Control	1.000	.887	503	563
			N = 1569	N = 1565

As the table shows, the weighted sample size is slightly different from the original sample size. Part of the reason is that the applicable

SPSS computer program stores weights for cases weighted 1 as .999. If the number of cases is large enough, the effect is to reduce the number of cases very slightly. In addition, fractions of cases are rounded down to the nearest whole number.

Weighting when only the San Fernando earthquake impact, inundation, or combined hazards zone is being compared with the control zone follows the same procedure, except of course that a different mean weight factor is used in each comparison. Weighting is not necessary when only control and old buildings zones are compared, because those tracts were not oversampled.

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CHAPTER TWO

METHODS OF ANALYSIS AND THE SPECIAL VULNERABILITY ZONES

The procedure for analysis of the special samples will be similar to that followed in case of the ethnic comparisons (Part Six), but not so extensive. There is no reason to expect comprehensive cultural differences or differences in life situations among the populations in the special zones. Whatever impact living in a zone of special vulnerability or past earthquake experience may have should be segmental rather than comprehensive, in contrast to the impact of ethnicity and race. Hence many of the interesting variables in ethnic and racial comparison have little or no meaning here and will be ignored.

Method of Analysis

The general procedure followed is to take up each special sample separately. The special sample is compared with the control sample for each of the variables of interest. If there are no differences or only a trivial number of differences, the analysis need be carried no further. The conclusion will be that living in the zone in question has no special effect on awareness and response to the current earthquake threat. If there are more than a trivial number of statistically significant differences, there will be further examination of those variables for which significant differences were found. The next step will be to determine whether these differences might have been the result of differences between the special sample and the control sample with respect to age, educational attainment, occupational socioeconomic status, household income, or ethnicity. In case of the first four of these covariates, the procedure will be to employ analysis of covariance, as in

Part Six. Because ethnicity is not a continuous quantifiable variable, it is less satisfactorily treated as a covariate in the analysis of covariance procedure. Consequently we shall either use it as a set of three dummy variables in the analysis of covariance or use other techniques for analysis as appropriate.

Since some of the special samples may not differ significantly from the control sample with respect to the four covariates or ethnicity, it will not always be necessary to proceed through all of the steps in the analysis. If we know from the start which special samples differ and which special samples do not differ from the control samples on age, the stratification variables, and ethnicity, we shall be in less danger of misinterpreting findings in the first round of comparisons. If we know, for example, that a given special sample differs from the control sample with respect to age, we must interpret any differences in earthquake awareness with greater restraint than if we know that the samples do not differ in age distribution. Consequently we begin by reporting the differences between each special sample and the control sample with respect to the four covariates of age and social stratification and with respect to ethnicity (Table 1).

Two of the special samples do not differ significantly from the control sample on any of the four covariates of age and social stratification. In these respects, residents of inundation zones that are not also characterized by disproportionate concentrations of old buildings and residents of the San Fernando earthquake impact zone are fairly representative of the population in areas of Los Angeles County that are not exposed to either of the special hazards and were not heavily damaged or threatened in a recent earthquake. Differences in age and social stratification are therefore not available as alternative explanations for any differences we find between these two samples

TABLE 1

AGE, SOCIAL STRATUM, AND ETHNICITY BY SPECIAL SAMPLES

Variable compared	Control	Inundation	Old buildings	Combined hazard	San Fernando impact
	Mean				
Age (years)	40.7	40.0	42.8*	47.1*	41.6
Educational attainment	12.5	12.6	11.9*	13.4*	12.8
Occupational status	42.7	38.6	40.6	47.5	46.3
Household income ($)	18.124	16.462	12.364*	14.470*	18.465
Income adequacy	2.76	2.70	2.24*	2.74	2.93
	Percent				
Black	10.7	1.6*	19.9*	10.6	1.0*
Mexican American	13.1	18.4	14.8	10.6	3.5*
White Anglo	69.2	65.6	54.6*	73.8	91.0*
Other	7.0	14.4*	10.7	5.0	4.5
Total	100.0	100.0	100.0	100.0	100.0
Number of persons	503	125	542	199	200

* Asterisk signifies that the mean or percentage is significantly different from the corresponding value for the control sample at or beyond the one percent confidence level. Other values listed are not significantly different at the five percent level.

and the control sample. There will be no need to conduct the kind of analysis of covariance for these two special samples that we conducted for Blacks and Mexican Americans in Part Six.

Both of the other special samples differ significantly on three of the four covariates. Residents in tracts with heavy concentrations of old buildings and residents in tracts that combine inundation hazard with an abundance of old buildings are significantly older and their household incomes are significantly lower than residents in the control area. Household incomes are especially low for residents of the old buildings zone, and the concentration of older people is especially striking in the combined-hazard zone. Two zones are at the opppsite poles of the educational distribution. Residents in the combined-hazard zone report higher average educational attainment than residents in any other zone. Residents in the old-buildings zone report the lowest educational attainment of any sample. It is clear that we must supplement uncontrolled comparisons between each of these special samples and the control sample with analysis of covariance to determine what differences are artificats of the age and social stratification differences.

To facilitate interpretation of differences in household income we devised an <u>index of income adequacy</u>. The index states income as a ratio to the minimum income required to maintain an adequate standard of living in a household of given size and age composition, as estimated by the United States Bureau of Labor Statistics for 1976. The evidence of low incomes in the old-buildings zone is reinforced by the finding of significantly lower income adequacy. But the sample in the combined-hazard zone is not significantly different from the control sample by this measure.

Differences in ethnicity are pervasive. Only the combined-hazard zone is ethnically representative of the less hazardous areas of the County. The inundation sample is quite similar to the control sample in the proportion

of White Anglos, but Mexican Americans are heavily overrepresented and Blacks are correspondingly underrepresented. The old-buildings zone has its share of Mexican Americans, but Blacks are overrepresented and White Anglos are underrepresented. The San Fernando earthquake impact zone stands out as disproportionately populated by White Anglos, with only two Blacks and seven Mexican Americans in the sample. Except in the case of the inundation zone, it will be necessary to test for the possibility that observed differences from the control sample are artifacts of ethnic or racial imbalance in the population.

As a prelude to examining each of the special samples separately, we have summarized in one extended table all of the simple comparisons made between each special sample and the control sample (Table 2). Means or percentages are reported for comparison with control sample means or percentages, along with the level of significance of the differences. In order to simplify the reading of an otherwise complex table, we have reported means or percentages for special samples only when they are significantly different from the respective means or percentages for the control sample.

Inundation Zone

Out of a large number of variables, only three significantly distinguish the inundation zone population from the control area population. One of these differences reaches the one percent level and the other two reach only the five percent level. The most reasonable interpretation is that the three "significant" differences are actually products of chance. In any series of comparisons, occasional differences large enough to be considered significant when viewed singly are to be expected on the basis of chance.

Elsewhere in this report we have observed that there seems to be little awareness of hazard from the potential collapse of dams in case of an earthquake.

TABLE 2

COMPARISONS BETWEEN SPECIAL SAMPLES AND CONTROL SAMPLES

Variable compared	Control	Inundation	Old buildings	Combined hazard	San Fernando impact
Personal characteristics and earthquake experience					
Owner-occupied household	59%	--	37%	34%	--
Relatives nearby	--	--	--	--	--
Groups, organizations nearby	1.24	--	.95*	--	.86*
Reads newspaper regularly	--	--	--	--	--
Earthquake experience index	2.02	--	--	--	2.24*
No damaging quakes	--	--	--	--	--
Damage to self or friends	.73	--	.86	--	1.75*
Other disasters experienced	--	--	--	--	--
Significant orientations					
Earthquake fatalism index	--	--	--	--	--
Earthquake invulnerability	1.79	--	1.69*	--	1.66
Favorability toward science	11.75	--	--	12.29*	--
Accuracy of scientific prediction now	2.77	3.08	--	--	--
Idea about earthquake cause?	4.09	--	--	4.28	--
Nature of earthquake cause	--	--	--	--	--
Folk signs for earthquakes:					
Animal behavior	66%	--	--	75%	--
Unusual weather	42%	--	--	--	33%
Premonitions	--	--	--	--	--
Aches and Pains	6%	--	10%	--	--
Prediction belief: Skeptic	4%	9%	--	--	--
Scientists and officials withholding information	--	--	--	--	--
Communication					
Media-discussion balance	--	--	--	--	--
Number of media sources	3.64	--	--	--	4.01
Discussed earthquake	--	--	--	--	--
Range of topics discussed	--	--	--	--	--
Range of discussion partners	--	--	--	--	--
Topic discussed:					
Predictions	--	--	--	--	--
Family preparations	--	--	--	--	--
Why earthquakes happen	--	--	--	--	--
Quakes around the world	25.92	--	--	35.40*	--
Old unsafe buildings	16.21	--	--	22.71*	--
Dams, flooding	11.80	--	--	--	17.09
Moving out	8.62	--	--	13.68*	--
Other topics	--	--	--	--	--

---- (continued) ----

Table 2 -- continued

Variable compared	Control	Inundation	Old buildings	Combined hazard	San Fernando impact
Earthquake hazard awareness					
Number of announcements heard	--	--	--	--	--
Types of announcements heard	--	--	--	--	--
Number taken seriously	--	--	--	--	--
Types taken seriously	--	--	--	--	--
Awareness of Uplift	1.23	--	--	--	1.62*
Awareness of groups at risk	1.40	--	--	1.86*	--
Breadth of awareness	--	--	--	--	--
Meliorability of group risk	3.25	--	--	--	2.95
Self in group at risk	.06	--	.15*	.24*	.13
Know whether fault nearby?	63%	--	53%	48%	--
Is fault nearby	2.00	--	2.31*	--	2.24
Fear index	--	--	--	--	--
Changed concern	--	--	--	--	--
Earthquake next year?	--	--	--	--	--
Release uncertain prediction?	--	--	--	--	--
When release 50/50 prediction	--	--	--	--	--
When release 90/100	1.57	--	1.74*	--	--
Hazard reducing action					
Personal preparedness index	--	--	--	--	--
Neighborhood cooperation	--	--	--	--	--
Measures taken and planned	17.25	--	20.66*	--	23.16*
Taken for future earthquake	9.16	--	11.19	--	14.46*
Government expenditure for hazard reduction (inclusive)	12.78	--	--	13.56*	13.38
Expend. for building safety	--	--	--	--	--
Expend. for prediction and warning systems	6.12	--	--	6.76*	6.57
Number of suggestions for government action	2.05	--	--	2.54*	2.38*
Type of suggestions:					
Structural safety	38%	--	31%	27%	--
Education	--	--	--	--	--
Emergency preparedness	23%	--	28%	36%	30%
Scientific research	18%	--	13%	--	--
Evaluation of government preparedness	1.81	2.01*	2.00*	--	--

* Asterisk signifies that the mean or percentage is significantly different from the corresponding value for the control sample at or beyond the one percent confidence level. Other values listed are significantly different at the five percent level. Values that are not significantly different are omitted.

When asked about earthquake hazard, people think most often of unsafe buildings and proximity to earthquake faults, and much less frequently about dam failure. The earlier findings gain support from the observation that residents of potential inundation areas exhibit no greater earthquake awareness, concern, preparedness, or concern for government action than people in safer areas of the County. One might anticipate some defensive denial of risk. But a total absence of differences unexplainable by chance cannot be credibly attributed to such a mechanism.

Even in the absence of greater concern and preparedness, we might have expected that knowing they lived below a dam would have sensitized people to earthquake topics. But there is no trace of heightened sensitivity. We looked especially at answers to the question, "If a damaging earthquake were expected in southern California, do you think any particular groups of people would be in greater danger than others . . . ?" to see whether respondents spontaneously mentioned people who live below dams. Residents of inundation zones are no more likely than other respondents to think of people living below dams as being in greater danger, and they are no more likely than others to think of themselves as being in special danger because of living below dams. We must conclude that residents living below dams are either unaware that they live in potential inundation zones or fail to recognize their situation as calling for special thought and safety preparations.

Zone of Old Buildings

Residents in the zone with unusual concentrations of old buildings differ from the control sample in several respects. The number of statistically significant differences is sufficient to justify a search for patterns.

For convenience we have abstracted just the items on which old-buildings-zone respondents differ significantly from the control sample from Table 2 into Table 3. Items in Table 3 can not be interpreted, however, without reference to the many items in Table 2 on which there are no significant differences.

We recall that Blacks are overrepresented and White Anglos are underrepresented in this zone, where residents are a little older, and are lower in both education and income than the control sample. Fewer of the residents belong to groups and organizations in the local community, fewer live in owner-occupied homes, and a few more of them report having experienced damage in an earthquake or having close friends or relatives with such experience. This small difference probably results from including a few tracts in the impact zone of the Long Beach-Compton earthquake of 1933. Otherwise they do not differ in earthquake experience, newspaper readership, or the presence of relatives nearby.

There are few differences in significant orientations that might shape earthquake-prediction response. Residents in the old-buildings zone are even less prone to claim invulnerability to earthquakes than the general populace. They do not differ in their faith in various kinds of earthquake forecasting except for a possible slightly more frequent acceptance of personal aches and pains as earthquake-premonitory signs. There are no differences in communication patterns concerning earthquakes and earthquake danger.

Residents living in neighborhoods where old buildings abound are no more or less aware of the various near predictions, forecasts, and cautions that were publicly discussed in 1976, and no more or less aware of the Uplift than residents in control neighborhoods. Fewer of them believe they know whether there is a fault near their residence, but more of those who think they know believe there <u>is</u> a fault nearby. More residents in this zone mention groups in special danger in case of an earthquake in which they include themselves. This difference is explained by references to people who live in old or seismically unsafe

TABLE 3

SIGNIFICANT DIFFERENCES BETWEEN OLD-BUILDINGS AND CONTROL SAMPLES: ANALYSIS OF VARIANCE AND COVARIANCE

Variable compared	Analysis of variance	Analysis of covariance
Personal characteristics and earthquake experience		
Owner-occupied household	(-).01	(-).01
Groups, organizations nearby	(-).01	(-).05
Damage to self or friends	.05	.001
Significant orientations		
Earthquake invulnerability	(-).01	(-).01
Folk signs: aches and pains	.05	--
Communication		
--none--		
Earthquake hazard awareness		
Know whether fault nearby?	(-).05	--
Is fault nearby	.01	.001
Self in group at risk	.01	--
When release 90/100 prediction?	(-).01	--
Hazard reducing action		
Measures taken and planned	.01	.05
Taken for future earthquake	.05	.01
Type of suggestions for government action:		
Structural safety	(-).05	(-).01
Emergency preparedness	.05	.01
Scientific research	(-).05	(-).01
Evaluation of government preparedness	.01	.01

structures. Residents are no more likely than respondents in the control sample to mention people who live in old and unsafe structures as being in special danger, but they are more likely to mention this group while having themselves in mind. Although they are no less favorable toward the eventual release of earthquake predictions, they are more disposed to delay issuance of a relatively certain prediction than respondents in the control sample.

Old-buildings zone residents are no more and no less prepared for an earthquake according to our battery of personal and household measures than residents in the control area. But they attribute more of their preparedness to the prospect of a future earthquake. And if they actually go ahead with what they say they plan to do but haven't yet done, they would be better prepared than the control sample. They offer no more and no fewer suggestions for government action than members of the control sample, but their emphasis is a little different. They more often propose emergency preparedness measures and less often propose government action toward increasing the structural safety of buildings or scientific research. In their evaluation of government preparedness they are more favorable than the control sample.

These items do not at once suggest a meaningful comprehensive pattern of difference. Unlike residents of the inundation zone, residents of the old-buildings zone do show awareness of their own vulnerable situation. Although this awareness has apparantly not made them more attentive to news of future earthquakes, and has not moved them to concrete acts of personal and household preparedness, it may have contributed to a greater sense that one <u>ought</u> to be preparing. It is reasonable to interpret both the attribution of actions to the earthquake prospect and the insistence that one still plans to take steps to a heightened sense that one ought to be earthquake-prepared. This state

of mind could mean a greater readiness for quick response in case of a credible warning of an imminently expected earthquake.

It is also surprising to observe that a greater awareness of the personal relevance of the old-buildings hazard does not lead to more frequent suggestions that government engage in steps to improve the structural integrity of buildings, or more prevalent advocacy of committing large amounts of government money to this purpose. Indeed respondents in the special sample seem to be slightly less likely to suggest this course of action for government and slightly more likely to suggest emergency readiness. Possibly living in and among old buildings of doubtful seismic safety gives residents a sense that the obstacles to correcting these conditions are insurmountable or that demolishing substantial numbers of buildings constitutes an unacceptable threat to community life. Hence they think more of what to do after the inevitable happens than of how to prevent disaster.

When the variables that distinguished between the old-buildings zone sample and the control sample are reexamined, reducing the effects of the four age and social stratification variables and ethnicity simultaneously, there are few changes (cf. right hand column in Table 2). A disposition to delay the release of a relatively certain prediction is more characteristic of older respondents, and controlling age statistically eliminates the difference in this variable. Similarly, including oneself in an especially endangered group disappears as a distinguishing characteristic. Differences on items that suggest a slightly augmented sense that the earthquake prospect ought not to be treated with an attitude of strict normalcy persist.

Combined Hazard Zone

The residents of the combined-hazard zone live in neighborhoods where there are both a concentration of old buildings and the possibility of flooding in case of a dam should collapse in an earthquake. In light of our finding that residents in simple inundation zones show no awareness of the special hazard to which they are subjected, we might expect the combined hazard sample to be indistinguishable from the old-buildings sample. Insofar as there are differences, we must look for other explanations before prematurely attributing them to the existence of doubly hazardous conditions.

The combined-hazard sample differs strikingly from the old-buildings sample in the higher level of education and ethnic representativeness (Tables 2 and 4). Although both samples are low on household income, the lower income is not translated into lower income adequacy in case of the combined-hazard sample. The combined-hazard sample is also distinctly older than any of the other samples. This configuration suggests that the sample may be drawn disproportionately from some of the neighborhoods favored by an earlier generation as desirable places in which to make ones permanent home. In Los Angeles these neighborhoods are especially likely to be in the more accessible lower slopes of the several ranges of hills that divide the County. More recent wealth tends to skip these neighborhoods where old buildings abound for newer and higher locations, which place them above rather than below the many dams used for water storage and flood control purposes. This characterization, if correct, suggests that old buildings in the zone of combined hazard often signify a distinguished past for the neighborhood, while old buildings in the zone of old buildings more often signify housing for citizens of modest income and social standing. Some of the sample tracts that fall in the combined-

TABLE 4

SIGNIFICANT DIFFERENCES BETWEEN COMBINED-HAZARD AND CONTROL SAMPLES: ANALYSIS OF VARIANCE AND COVARIANCE

Variable compared	Analysis of variance	Analysis of covariance
Personal characteristics and earthquake experience		
Owner-occupied household	(-).01	(-).01
Significant orientations		
Favorability toward science	.01	.05
Accuracy of scientific prediction in future	.05	.05
Folk signs: animal behavior	.05	--
Communication		
Topic discussed:		
Quakes around the world	.01	.001
Old unsafe buildings	.01	.05
Moving out	.01	.01
Earthquake hazard awareness		
Awareness of groups at risk	.01	.01
Self in group at risk	.01	.001
Know whether fault nearby?	(-).05	.01
Hazard reducing action		
Number of suggestions for government action	.01	.01
Government expenditure for hazard reduction (inclusive)	.01	.01
Expenditure for prediction and warning systems	.01	.01
Type of suggestions for government action:		
Structural safety	(-).05	(-).01
Emergency preparedness	.05	.01

hazard zone, such as those in Hollywood and Pasadena, contain a mixture of long-time residents with ties of sentiment and culture to the local community and recent immigrants to the United States of moderately high socioeconomic status. However, samples from the two zones are alike in the low proportion of owner-occupied households.

The combined-hazard sample is similar to the old-buildings sample in the greater proportion who include themselves among people who are in greater danger in case of an earthquake and the lesser number who live in owner-occupied households. Like the old-buildings sample, this difference from the control sample is explained by the greater number who identify themselves as being at risk because of living in old buildings. Like the inundation sample, they do not see themselves as being at risk because of living below dams. Thus residents in the two zones where old buildings are disproportionately concentrated are alike in awareness of the special hazard to which they are subject. In contrast, the two zones potentially subject to inundation are alike in the lack of awareness of the personal relevance of this hazard.

The two samples from old-buildings zones are alike in their distinctiveness from the control sample in only two other respects. In offering suggestions for government action they are a little less likely to mention steps to enhance the structural safety of buildings and a little more likely to mention preparedness for emergency. And they are less likely to claim they know whether there is a fault near their residence.

Among significant orientations, residents in the combined hazard zone are more favorable toward science and have greater faith in eventual prediction of earthquakes by scientists. The latter observation is complemented in the action category by greater support for government spending to improve earthquake prediction and warning systems. They also believe more strongly in animal behavior as an earthquake sign. In the realm of communication

more of them have discussed earthquakes around the world, the problem of old buildings, and the possibility of moving out. Besides recognizing their own vulnerability in old buildings, they show a wider range of awareness of groups in special danger. There are no differences in personal preparedness, or ascription or intention as there was for the sample from the old-buildings zone. But they do have more suggestions for government action and express more support for government expenditure for hazard reduction.

As with the sample from the zone of old buildings, controlling statistically for the four age and social stratification covariates has little effect on the findings. Even after introducing controls, this sample appears to be somewhat more sophisticated than the single-hazard old-buildings sample, with its more favorable orientation toward science and scientific prediction, and less disposition to compensate for lack of special preparedness by statements of intention and doubtful ascription of preparedness to the earthquake prospect. Because respondents in the combined-hazard sample show no awareness of inundation hazard, the differences between the two samples from zones where old buildings are concentrated cannot be explained on the basis of this additional hazard, but must be explained by the nature of the two different kinds of neighborhoods in which heavy concentrations of old buildings are found.

Living where old buildings are concentrated does tend to sensitize people to their personal vulnerability. Perhaps it leads people to find less hope for ameliorating the problem through government action to facilitate reinforcement or reconstruction of unsafe buildings, and to be more aware of the need for emergency readiness to deal with catastrophe when it occurs. But the awareness is not translated into the completion of concrete self-protective measures or into greater attention to near predictions, forecasts, and cautions concerning future earthquakes. Nevertheless, in different ways, the two samples may share an augmented attitude of preparedness that has not

yet reached the threshhold for conversion into action. By engaging disproportionately in the discussion of earthquake happenings, the problem of old buildings, and the possibility of moving out, the combined hazard sample may have developed a sensitization and some preliminary understanding that could facilitate action if the need became clearer. Similarly, the sense of obligation to prepare for earthquake disaster apparant in the sample from the old-buildings zone may render these people more susceptible to public leadership in what is recognized as a time of urgency.

Conclusions Concerning Zones of Special Vulnerability

The evidence in this chapter leads to the conclusion that it is possible to heighten awareness of special hazards through repeated attention in the media. However, we find no evidence that this heightened awareness necessarily leads to heightened interest in near predictions and forecasts of earthquakes or to increased personal preparedness. The most that can be said is that heightened awareness of personal vulnerability may in the future contribute to a greater readiness to respond to official direction in the case of a credible state of emergency.

It is clear that recognition of personal vulnerability does not occur without concerted public education through the mass media or other communication channels. People who live in zones subject to inundation in case of dam failures exhibit a uniform insensitivity to their personal vulnerability in case of an earthquake. There has been almost no public attention either to the safety of local dams in an earthquake or to what potentially threatened residents could do in preparation or at the time of a disaster.

The heightened awareness of the hazardous nature of many old buildings can be cultivated through media attention even though the affected individuals

have not experienced loss to themselves or close associates in a destructive earthquake. This observation is slightly compromised by inclusion of a few older people who were in the damage zones when the Long Beach-Compton earthquake struck in 1933 in one special sample. But the findings on which the conclusion rests appear equally clearly in the second sample from zones where old buildings are also concentrated.

CHAPTER THREE

EARTHQUAKE COVERAGE IN THE SAN FERNANDO VALLEY NEWS

The San Fernando Valley News and Green Sheet was monitored for earthquake related news items over a three year period (1976-1978) as were two other English language community papers, the Santa Monica Evening Outlook and the San Gabriel Valley Tribune. The Valley News was singled out for special consideration to highlight themes or points of special emphasis which may have emerged as a result of that area's having experienced a recent destructive earthquake.

The Valley News, owned by the Chicago based Tribune Company, began publishing seven days a week on September 10, 1979. According to information supplied by the paper's marketing services department, the Valley News, prior to its acquisition by the Tribune Company in 1973, was a four-day-a-week "free shopper" with a circulation of 280,000. The paper now has 112,000 paid subscribers and serves the San Fernando Valley, Burbank, Studio City, and adjoining areas. Fifty-five percent of the households in the Valley News' circulation area receive the paper. In comparison, the Los Angeles Times is taken by 33 percent of the households in the area and the Herald Examiner by ten percent. The focus of the paper is decidedly local. The Valley News editor, Bruce Winters, was quoted in a New York Times feature article on the Valley News as saying "we look at the world from the inside out. Sacramento and city hall are our foreign bureaus"(8-14-79).

According to information obtained in our survey, 4.8 percent of the sample (N = 70) read the Valley News. Thirty-one percent of the Valley News

readers read only that newspaper, 42 percent read one paper in addition, and 21 percent read two additional papers. Nearly six percent read three or more papers. For those who identified the Valley News as their main source of information, 56 percent (N = 39) indicated that they also read the LA Times and 18 percent (N = 13) read the Herald Examiner.

The Valley News serves an area which sustained the heaviest damage in the 1971 San Fernando Valley earthquake. The paper's focus on events of local interest and on events of broader significance as they impact upon the local community leads to the expectation that coverage of earthquake topics would reflect this recent experience with a disaster of significant proportions. How earthquake topics are presented to this quake-experienced news audience will be the topic of this analysis.

General Coverage of Earthquake Topics

The total number of earthquake related news items included in the Valley News varied from a high of 57 in Period 3 (April 21--July 27, 1976) to a low of 28 during Period 7 (May 13--September 8, 1977). The average output of articles per period was 36.7 for the Valley News, 35.5 in the Santa Monica Evening Outlook, 33.1 in La Opinion and 48.6 in the San Gabriel Valley Tribune.

In its percentage distribution of articles in the major categories of earthquake events and preparedness/safety, the Valley News resembles the LA Times to a greater extent than the other community newspapers. In contrast to the disproportionate coverage of earthquake events in community papers, especially La Opinion and the Outlook, the Valley News consistently devoted a lower percentage of quake reports to announcements of earthquake occurrences. During Periods 2 (February 4--April 20, 1976) and 10 (April 22--August 13, 1978)

the proportion of articles on earthquake events in the Valley News was the lowest among monitored newspapers. In Periods 3, 5, 6, 8, 9 and 10, the percentage of Valley News articles devoted to event coverage was less than fifty percent. In both frequency and percentage, Valley News coverage of earthquake prediction was typical of other community papers. Despite extensive initial coverage of the Palmdale bulge, prediction coverage declined in frequency after Period 3 (April 21--July 27, 1976) to a level consistent with other community papers. The Valley News tended to under-report specific predictions as evidenced by the low output of articles on the Whitcomb and Minturn announcements.

Preparedness and safety were consistently emphasized themes in the Valley News. The percentage distribution of items on preparedness and safety in the Valley News is comparable to that of the LA Times and the San Gabriel Valley Tribune and consistently higher than the Herald Examiner, La Opinion, and the Santa Monica Evening Outlook. Organizational preparedness and building safety were topics which received consistent coverage over the entire three year period in the Valley News. All community newspapers played an important role in the dramatic November, 1976 to February, 1977 rise in coverage of individual preparedness. Dam safety became the focal point of a vigorous Valley News editorial campaign in 1978. The remainder of this section will analyze Valley News coverage of major topics. Of particular interest will be a comparison of Valley News coverage with the two other English language community papers.

Earthquake Events

All monitored newspapers tended to devote a greater percentage of coverage to events. The English language community papers characteristically contained higher proportions of reports of quake occurrences than the Los

Angeles Times but lower than La Opinion. The percentage of event coverage in the Valley News ranged from a high of 75 percent during Period 4 to a low of 30 percent in Period 10. Tables containing the frequency and percentage distribution of all major topics are located at the end of each chapter in Part Two. Since an extensive substantive analysis of event coverage is beyond the scope of this summary analysis, three well publicized earthquake events will be singled out for review. The three events were chosen on the basis of their proximity to the Los Angeles metropolitan area and include one quake in a nearby community, one in the western hemisphere and one in eastern Europe. The three English language newspapers will be compared on the basis of their coverage of the Guatemala quake of Feburary 4, 1976, the Rumanian tremor which occurred on March 4, 1977, and the Santa Barbara earthquake of August 13, 1978.

The Guatemala earthquake, February 4, 1976. The Guatemala earthquake was, by far, the most heavily reported of all earthquake events which occurred during the three year monitored period. La Opinion, with 87 articles, was largely responsible for this extensive coverage. The two metropolitan dailies, the Los Angeles Times and the Herald Examiner, offered 36 and 51 reports, respectively. The English language community papers were quite uniform in the amount of coverage devoted to this event: 26 reports appeared in the Valley News, 22 in the Tribune, and 28 in the Outlook.

Content of the reports in community papers did not differ substantially. All three detailed the rising number of fatalities and casualties, the extent of the devastation, and the international relief effort. Valley News coverage did stand out in two respects. The Valley News seemed to present a more personalized view of the disaster with first-hand reports from those who had been in Guatemala during the quake and an emphasis upon the impact of the

quake on the lives of residents rather than the more impersonal aspects of the disaster. Consistent with its decidedly local orientation, many Valley News reports on the disaster included anecdotes about local residents who experienced the quake or had gone to Guatemala to serve in the relief program and local efforts to aid the quake victims.

Three Valley News reports mentioned the 1971 San Fernando Valley quake. Neither of the other two community papers did so during the Guatemala quake's news history. Just five days after the Guatemala tremor, a Valley News article commemorated the San Fernando quake which claimed the lives of 64 valley residents. A February 12 report included eyewitness accounts of the Guatemala disaster by two valley residents who had been in the impact area. One remarked that the quake had felt very much like the San Fernando Valley tremor. It was also observed by this witness that the aftermaths of both quakes were characterized by cooperation and helping behavior rather than confusion and panic. A third article featured the efforts of quake-experienced valley ham radio operators who offered to link area residents with friends and family in Guatemala (2-13-76).

The Rumanian quake, March 4, 1977. The quake, which was felt over a large portion of eastern Europe, had its greatest impact on Bucharest and Ploesti, Rumania. The high death toll of over 1300 and the highly politicized relief effort made the disaster one of the more newsworthy quake events of 1977. All monitored newspapers covered the event. Among community newspapers, the Outlook contained six reports, the Tribune nine and the Valley News seven.

In its reporting of the Rumanian quake, the Valley News did not differ from its community counterparts. There were no references to the San Fernando quake and no expressions of personal empathy by those close to the suffering. For the most part, accounts were reproduced from wire service reports with

little involvement by local journalists to bring the event closer to the experiences of the communities served.

The Santa Barbara earthquake, August 13, 1978. An earthquake which caused widespread minor damage in the Santa Barbara area provides an occasion for greater contrast among the three community newspapers. All three papers reported the quake, giving it front page coverage the day after its occurrence. The Valley News, however, was distinctive in several respects. It offered greater coverage than the other two English language community papers with six reports. The Tribune published four and the Outlook three. Rather than present wire service reports, the Valley News cover story on the quake was written by a staff journalist who had toured the impact area and interviewed witnesses (8-15-78).

On August 16, the Valley News contained an editorial citing the Santa Barbara quake as "a grim reminder that residents of the San Fernando Valley and its neighboring communities are not immune to temblors of equal or greater intensities." The editors asked rhetorically, "does another disaster as devastating as the Valley's 'killer' quake of 1971 have to strike before public officials and citizens recognize the need to design and implement plans to prepare our densely populated Southland communities against possible earthquakes?" Statewide earthquake disaster planning and dam evacuation programs were frequent Valley News themes during the latter half of 1978. The Santa Barbara quake did not prompt editorial comment in either the Outlook or Tribune.

One final point of comparison was noted. The Santa Barbara quake stimulated renewed media scrutiny of the site chosen by utility companies for an LNG terminal at Point Conception. Both the Valley News and the Tribune carried reports quoting both opponents and proponents of the project. The Outlook did not report this new development in the LNG controversy. The Valley

News was the only community paper to mention either dam safety or the 1971 San Fernando quake in connection with the Santa Barbara tremor.

Earthquake Prediction

Considered over the entire three year monitored period, Valley News coverage of earthquake prediction was typical of other community papers. The Valley News produced an average of 7.6 articles per period, the San Gabriel Valley Tribune and Santa Monica Evening Outlook accounted for eight and five, respectively. Output of prediction articles in the community papers compares with the larger average number of those published by the LA Times at 16.7 per period and a low of three per period in La Opinion. These gross figures tell us little, however, about fluctuations in coverage, substantive content, or points of special emphasis. Three prediction topics will be considered to determine whether the Valley News presented events in a unique manner: the Palmdale bulge, the experimental earthquake forecast by Caltech geophysicist James Whitcomb and the pseudo-scientific prediction of Henry Minturn.

The Palmdale bulge. For the Los Angeles area community papers, announcement of discovery of the Uplift was not one of sufficient importance to be accorded front page priority. In contrast to LA Times'coverage with a page one feature article by science writer George Alexander, the community papers published brief wire service reports which were remotely located. After its initial similar presentation by the community papers, however, the Palmdale bulge received significantly greater attention in the Valley News during the two months preceding Whitcomb's public forecast. During this period (March 1 through April 20), the Valley News carried nine reports which mention the Uplift, all of them on the front pages. During this same time span, the Tribune contained two articles and the Outlook four, none of which received front page

priority. A six-part series in the Valley News authored by staff writer Arnie Friedman and published between April 4--13, 1976, contributed significantly to the greater number of items on the Uplift. The series, entitled "Earthquake Country: Are We Ready?" focused principally upon the prospect of a great earthquake in the Los Angeles area and the readiness of southern California communities to cope with such a disaster. Themes familiar to San Fernando Valley residents preface the series as revealed in the following editor's note:

> Here in 'Earthquake Country' the next whopper could come at any time. In fact, we're overdue, scientists say, for a temblor that would dwarf the 1971 Valley quake. Is the Los Angeles area prepared? What's been done since 1971 to brace for it? What still needs to be done? Will an earthquake prediction save the day? (4-4-76)

In the series, the newly discovered Uplift was regarded as a sobering reminder of local quake vulnerability and it provided, according to Friedman, "ammunition for plugging the earthquake preparedness gaps." The Bulge was a prominent topic of discussion in the last installment of the series which featured earthquake prediction. The Uplift, Friedman pointed out, quoting Dr. Robert Wallace of the US Geological Survey, did not necessarily indicate that a great earthquake was imminent. Rather, such huge tremors were known to reveal precursory signs years, even decades, ahead of time. Friedman also mentioned that federal funds had been requested to intensify study of the uplifted region (4-13-76). Other early mentions of the Bulge were made on the occasions of the Seismic Safety Commission and California Earthquake Prediction Evaluation Council assessments of the danger posed by the geological anomaly (3-12-76, 4-18-76). The subject of one article (4-16-76) and a point made by Friedman in the first article of his series was that an uplift similar to that recently discovered by the US Geological Survey existed prior to occurrence of the 1971 San Fernando Valley quake. Although this fact was

mentioned in the extensive Los Angeles Times coverage of the Uplift, it was not revealed in reports by the Tribune or Outlook.

During the remainder of 1976, from April 21 through December 31, the number of reports in the Valley News which mentioned the Uplift fell behind that of the Tribune but remained comparable to the Outlook. The Tribune contained ten articles compared to six in the Valley News and five in the Outlook. The greater attention to the Uplift by the San Gabriel community paper is mostly accounted for by three articles whose main topic was the Whitcomb prediction but also mentioned the Bulge. The Outlook and Valley News contained just one such article each. References to preparedness and safety in combination with the Uplift occurred with greater frequency in the Valley News than in the other two community papers. While only 20 percent (2 of 10) Tribune reports combined Uplift and preparedness themes, 60 percent (3 of 5) and 67 percent (4 of 6) of the Outlook and Valley News reports did so. The Valley News stressed dam safety in connection with the Uplift, devoting two reports to the seismic structural stability review of the Bouquet Canyon dam. The reports, both authored by Arnie Friedman, informed readers that the dam stood above the Newhall-Saugus area for which Whitcomb had predicted a moderate quake within a year. Friedman also pointed out that the dam was located just five miles from the San Andreas fault along which the Uplift had recently been discovered. The author referred to a 1973 federal study which cautioned that the dam could fail in a major quake, causing as many as 7,500 drownings and leaving 110,000 homeless (4-25-76).

The remainder of the monitored period covering 1977 and 1978 witnessed a tapering off of coverage of the Uplift in all newspapers. During the entire year of 1977 the Tribune published eight articles, the Valley News offered ten and the Outlook just four. Only two reports touching on the Uplift appeared in community papers during the entire year of 1978, one in the Valley News

and one in the Tribune. Combined references to the Bulge and preparedness declined in frequency over the last two years. The Valley News mentioned some aspect of preparedness in 27 percent (3 of 11) of its uplift related articles during this period while the Tribune did so in 11 percent and the Outlook no such combined references in 1977 or 1978. All three community papers offered coverage of the several developments or changes in the status of the Uplift in 1977 and 1978, including discovery of a tilt near Palm Springs, evidence of new deformation in the uplifted region, and results of numerous scientific studies of the Bulge.

Whitcomb. Coverage of the experimental forecast issued by Dr. James Whitcomb of Caltech varied in quantity and emphasis among the three community newspapers. The distribution of reports chronologically differed as well. The Tribune provided nine reports, the Valley News eight, and the Outlook five. All three community papers offered the greatest coverage during April, within a week of the prediction's public release on April 21, 1976 (all three papers contained four April reports). Outlook coverage began with announcement of Whitcomb's experimental forecast on April 21 and ceased after it was revealed that the California Earthquake Prediction Evaluation Council had rejected the prediction on May 1, 1976. The first of eight reports in the Valley News appeared on April 22, the last, on June 25, 1976. The forecast enjoyed the greatest longevity in the Tribune which was the only community newspaper to announce, on December 11, 1976, Whitcomb's cancellation of the prediction.

In the news history of Whitcomb's prediction, mention of the 1971 San Fernando Valley quake was not a unique feature of the Valley News. Both the projected magnitude of the predicted quake (5.5 to 6.5) and its expected area of impact in the Newhall-Saugus area prompted all monitored newspapers

to compare the 1971 event with that predicted by Whitcomb.

Despite the potential for sensationalized coverage of the forecast, all three community papers reported the announcement in a responsible and subdued manner. Perhaps the most cautious presentation of the Whitcomb hypothesis was that by the Valley News. Announcement of the prediction on April 22 appeared beneath the headline "Drastic Action Not Advised, Caltech Scientist Cautions." Also carefully handled was the proposal by LA City Councilman Louis Nowell to sue Whitcomb and Caltech over alleged damage to property values in the San Fernando Valley district he represented. Despite greater coverage of Nowell's action (4-22-76, 4-23-76, 4-25-76), the Councilman's proposal was not endorsed by the newspaper. Two Valley News editorials urged Valley residents to take common sense precautions but not overreact to the forecast. Without condemning either Whitcomb or Councilman Nowell, an April 25 commentary suggested that readers reserve judgment until the forecast was evaluated by the California Earthquake Prediction Evaluation Council. "In the meantime," said the editors, "we suggest that Southland residents consider that the overall score on earthquakes as compared to other attacks by Nature in other parts of the country and the world, show the ratio toll in lives and property to stand up pretty well." A second editorial entitled "Quake Panic is Not Called For," quoted Dorthea Dix: "I will not permit myself to be depressed at what I cannot help to an end." Without mentioning Whitcomb by name, the editors said of Dix' statement, "it is an attitude that must prevail here in the Valley in dealing with dire predictions of an earthquake sometime during the next year." In the closest approach to criticism of the Whitcomb forecast, the editors referred to the effect of the warning on children. "Young children have to live with enough tension without having to cope with immoderate talk about what might happen" (5-11-76). The Outlook carried one editorial cautioning against panic (4-26-76). The

The Tribune did not publish an editorial on the forecast.

Preparedness was not a particularly visible topic in combination with news of the Whitcomb prediction. The Tribune and Outlook carried one report each, both of which touched mainly upon organizational response to Whitcomb's announcement. Three Valley News reports contained preparedness or safety themes in conjunction with Whitcomb. A June 25, 1976, article described proposals adopted by a conference composed of participants from the University of Southern California's Institute for Disaster Preparedness and the City of San Fernando. Among the proposals was the recommendation that newspapers be encouraged to publish information about the potential disaster "designed to reduce rather than stimulate fear." Local businesses, according to another recommendation, should develop evacuation plans and hold drills. It was also urged that something be done to reduce the danger posed by older unreinforced masonry buildings. The Valley News was the only community ppaer to mention dam safety in connection with Whitcomb's warning (and the uplift). Two reports (4-25-76 and 6-15-76) cited the enhanced danger of a major quake with discovery of the Uplift and Whitcomb's prediction as prompting a structural stability review of the Bouquet Canyon Dam.

Minturn. By the time Henry Minturn and his predictions, including one for southern California on December 20, 1976, received coverage in area newspapers, he had already been featured on local television news programs beginning on November 22, 1976. It was apparent both by virtue of their delayed coverage and the tone of articles once they appeared that area newspaper editors were reluctant to publicize the forecasts of a man with dubious methods and questionable credentials. All three English language community papers reported the Minturn predictions in December, 1976, with coverage in all three limited to that month only.

In early reports by the Valley News, Outlook, and Tribune, Minturn, his background and forecasting methods were as much a subject of analysis as his predictions. In each community paper, Minturn was introduced to the news audience through the evaluation of respected scientists who had discussed earthquake matters with the press many times before. The first of three Valley News reports appeared on December 2. Written by staff writer Teresa Chuh, it was entitled "Skepticism Greets Prediction of December 20 Southland Quake." Dr. Clarence Allen, speaking before the Los Angeles Breakfast Club, responded to questions about Minturn's warning and was extensively quoted. Allen acknowledged that it was a fair statement to say that California was due for a major earthquake but to give a specific date of occurrence was "presumptuous." "We just can't predict with that kind of accuracy yet," said Allen. The Outlook reported Allen's comments about prediction in general but did not report the details of Minturn's forecasts until December 8. In a report similar in approach to that of the Valley News, the Tribune on December 1 closely examined Minturn and his warnings through the critical evaluation of Dr. Peter Ward of the US Geological Survey. All community newspapers reported the tremendous number of phone calls directed to local universities and government agencies regarding the Minturn announcement and implied that their reluctant coverage was due to public demand for information.

Minturn's mysterious background was also the subject of media scrutiny. Early reports in community papers referred to Minturn as "Doctor", "geophysicist" or "industrial engineer". After a lengthy December 5 feature article in the LA Times by George Alexander which completely unmasked Minturn, reference to academic titles was deleted in community newspaper reports. Most early reports also credited Minturn with a record of successful predictions. Later reports, however, pointed to the considerable geographical discrepancy between a quake predicted for Mexico City which occurred in Chile. Those reports which appeared

after December 20 referred to Minturn as a "self-styled" forecaster (Valley News, 12-22-76), a man who had turned to predicting earthquakes after such varying careers as security guard, prospector, mail sorter and technician (Outlook, 12-22-76). These reports clearly separated Minturn from the community of respected scientists who had been critical of his methods from the time of his first public announcements in November.

Preparedness was mentioned in one of the three Valley News reports on Minturn. The article focused on the work of Dr. Steven Howard of the San Fernando Valley Child Guidance Center. Dr. Howard spoke of the effects of the Minturn prediction on the children he treated and indicated that the psychological impact of such a specific forecast, i.e., to occur on a given day, was to produce anxiety. He made several recommendations to parents on how to help their children cope with fears produced by the prediction (12-16-76). The Outlook did not mention preparedness in connection with Minturn and the Tribune published one lengthy article with three separate parts. One section dealt with organizational readiness to respond in a quake emergency. The other covered individual and family precautions. An editor's note indicated that the reports had been prompted by Minturn's December 20 forecast.

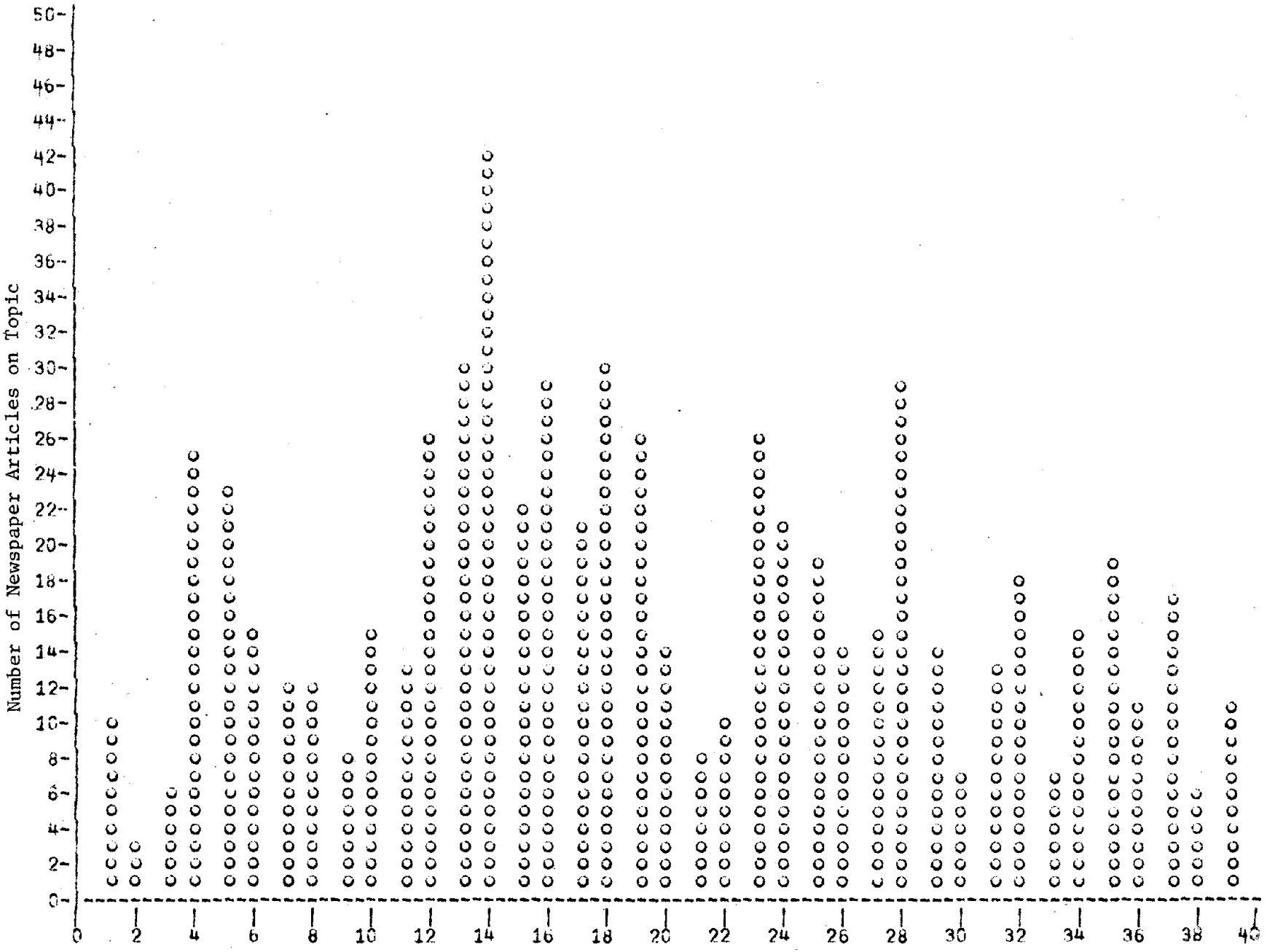
Preparedness and Safety

It is in the area of preparedness and safety that the Valley News, when compared with other community papers, is most distinctive. The Valley News offered the greatest number of articles featuring earthquake preparedness, building safety and editorial comment of the three community papers. It also contained the largest number of articles with combined reference to preparedness, safety, and prediction topics. Reports which contain reference

to two or more substantive themes (events, prediction, preparedness and safety) give us a crude index of comprehensiveness and issues of special concern to the news audience served. Those topics which most often appeared together in the same Valley News articles were preparedness and prediction (N = 21) and preparedness and dam safety (N = 10). It will be recalled that Whitcomb's predicted quake was to be centered in the San Fernando Valley and that thousands of Valley residents were evacuated when the 1971 tremor caused the near collapse of the Van Norman dam. The Valley News demonstrated the least interest in nuclear power plant safety with only seven reports in three years. The San Gabriel Valley Tribune offered the most extensive coverage of dam safety and nuclear power plant safety. The Outlook lagged behind the other community papers in coverage of every category except building safety.

Organizational preparedness. Figure 1 reveals the distribution pattern of preparedness and safety articles over the three year period of study. The substantial increase in coverage roughly from March 25 to May 19, 1976, reflects the enhanced concern with governmental ability to respond to a quake emergency in the aftermath of the uplift's discovery. Valley News coverage of organizational preparedness during the volatile month of April, 1976, was not more extensive than its two community counterparts, but exceeded the output of both metropolitan dailies. During the more extended period of media sensitivity to organizational preparedness (March--May, 1976) the Valley News contained twelve reports, half of which were written by Arnie Friedman for the series "Earthquake Country: Are We Ready?" During this same period the Outlook offered five reports and the Tribune three.

The experience of the San Fernando Valley with a recent damaging earthquake was reflected in numerous references to the earlier quake in reports which focused on organizational preparedness. One of Friedman's feature



PREPARATION AND SAFETY ARTICLES IN FOUR WEEK PERIODS
JANUARY 1, 1976 TO DECEMBER 31, 1978

FIGURE 1

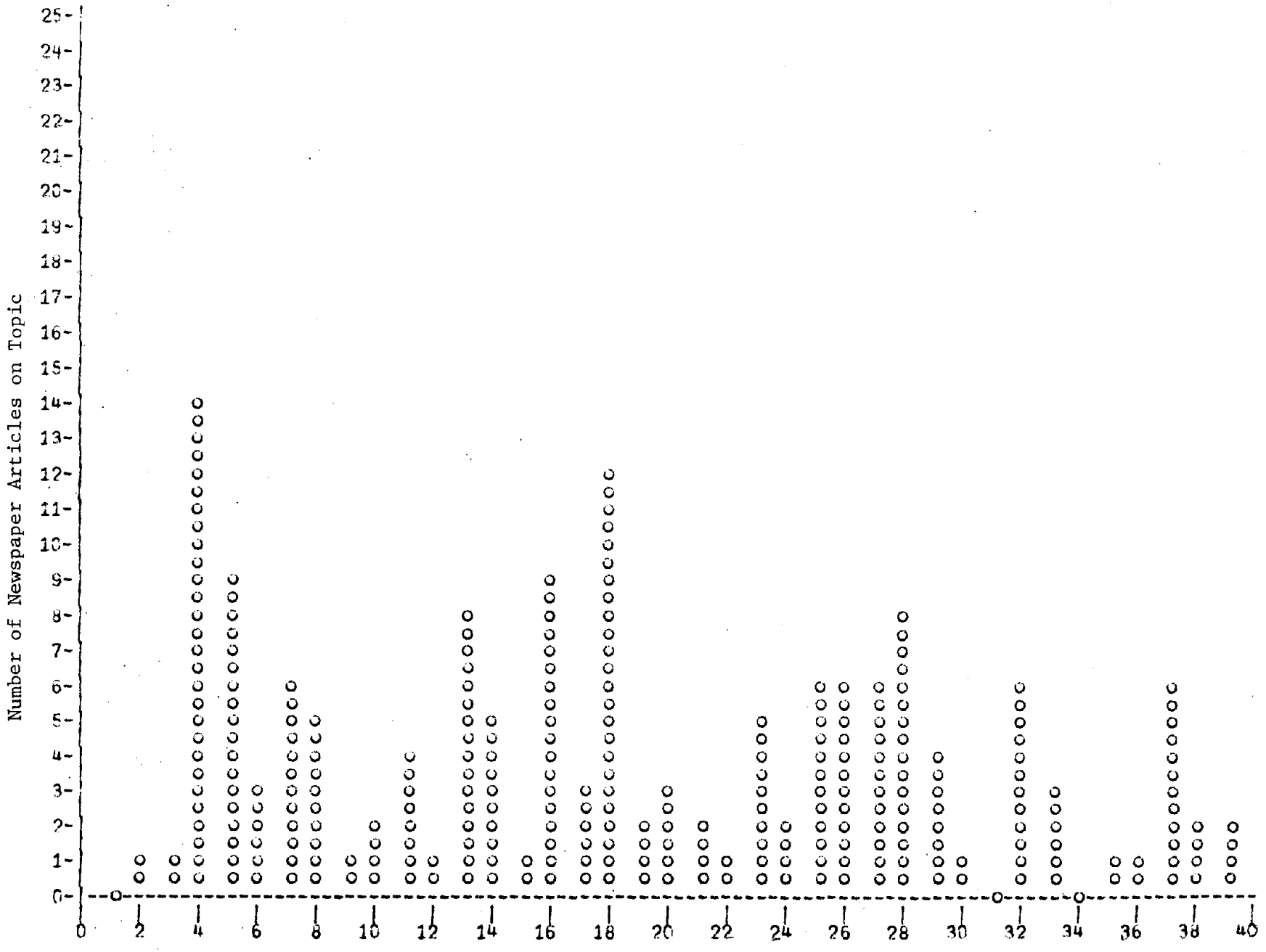
articles addressed the efforts made to improve organizational response since the 1971 quake. The lessons learned after that quake, implied Friedman, resulted in changes which made the Los Angeles area a far safer place in which to live. Included among these preparedness measures was greater coordination among disaster relief agencies, particularly the sheriffs and fire departments, the utilities and medical facilities. Enhanced concern with the safety of dams followed the near collapse of the Van Norman dam and evacuation of 80,000 Valley residents. This concern was reflected in a commitment by the Department of Water and Power to inspect local dams more thoroughly. Quake drills in schools and businesses were practiced and legislation was passed to upgrade building codes. Prediction was a prominent theme in Valley News reports during this period reflecting both optimism that a prediction system would be developed and the possibility that the uplift might become the basis for a predicted quake for southern California. The San Fernando temblor was also mentioned as a point of comparison with an anticipated great earthquake. The 1971 quake, it was implied, was mild when measured against the impact a great earthquake would have on the Los Angeles area.

As the Uplift and Whitcomb's prediction waned as news items, so did attention to organizational preparedness. After a period of relatively low output of preparedness, articles from June through November, 1976, a December increase occurred, possibly in response to concern over Minturn's forecast. However, only one organizational preparedness report mentioning Minturn appeared in a community paper. That report was a December 22 editorial assessment of the failed Minturn forecast in the Valley News. It was the position of the editors that earthquake prediction was not a mature science and that false alarms must be expected. Even false alarms were valuable if communities and their governments took action to prepare citizens for

disaster. The Santa Monica Evening Outlook was responsible for the greatest number of articles during December with six, mostly promoting their publicaion of the series "Common Sense and Earthquake Survival" by Fil Drukey.

It appears that there was no central event or development responsible for intensification of media interest in organizational preparedness between March and May, 1977 (Figure 2). Community papers did not contribute significantly to this peak of coverage. It was, in fact, characterized by a very low number of organizational preparedness reports in the Valley News and Outlook. The Valley News made a substantial contribution to a less dramatic increase in coverage between November 1977 and February, 1978. This coverage highlighted several weaknesses in area disaster preparedness including communications among agencies, the organization of health care services in a disaster, and dam failure evacuation planning. This last point was the subject of six articles during this period, two of them editorials and one letter to the editor. Evacuation planning became a cause célèbre for the Valley News, which between December, 1977, and December, 1978, featured six editorial statements urging that dam evacuation plans be adopted.

Impetus for this editorial campaign was provided by a report compiled by Seismic Safety Commissioner Will H. Perry. Among several problem areas in disaster preparedness cited by Perry, the dam evacuation program, the only disaster program mandated by state law, was singled out by staff writer Bill Packer for more extended discussion (Valley News, 2-13-77). Perry was quoted as saying that the law requiring jurisdictions to submit evacuation plans was enacted after the near collapse of the Van Norman dam during the 1971 San Fernando Valley quake. But the program was, according to Perry, "perhaps a failure" due to widespread noncompliance. Editorials on December 14, 1977, and January 18, 1978, urged priority status for dam evacuation planning. These



ORGANIZATIONAL PREPAREDNESS ARTICLES IN FOUR WEEK PERIODS
JANUARY 1, 1976 TO DECEMBER 31, 1978

FIGURE 2

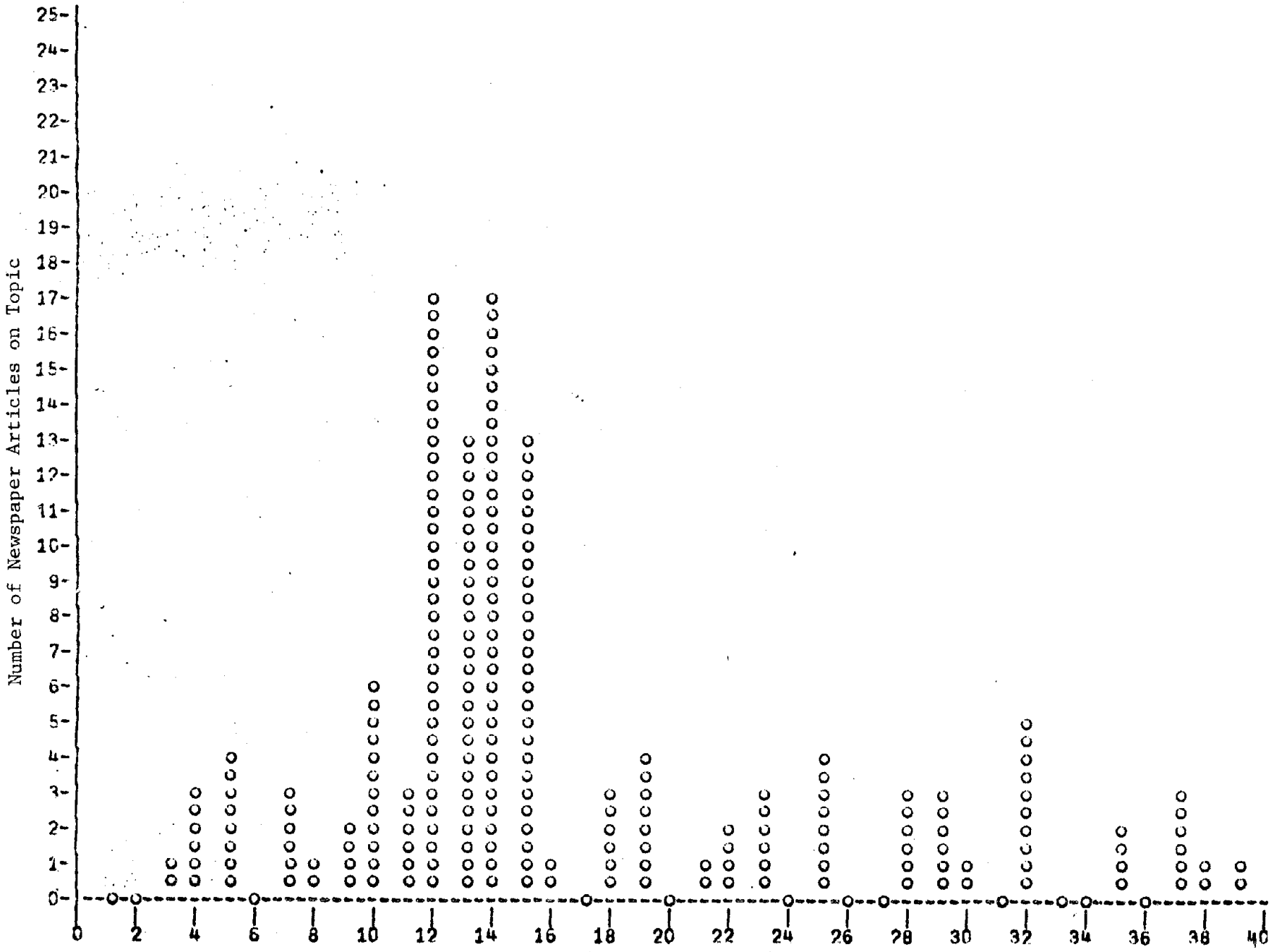
commentaries drew a response from Charles Manfred, Director of the Office of Emergency Services. Manfred commended the Valley News for its "keen interest" in state and local disaster planning and assured readers that "California's dam safety program is the best in the nation." The OES director held that large scale evacuation of entire communities was neither feasible nor desireable as a defense against earthquakes. Selective evacuation planning for areas vulnerable to secondary hazards (areas below dams and coastal areas subject to tsunamis) was a matter of high priority, according to Manfred. Despite these reassurances, emphatic editorial criticism of evacuation planning continued with commentaries published on May 25, June 23, and December 1, 1978. Throughout this year-long editorial campaign, the attention of readers was called to the experience of the 1971 "killer quake" which prompted evacuation of 80,000 Valley residents when it appeared that the Van Norman dam would collapse.

The vigorous compaign for dam evacuation planning by the Valley News contributed to the sustained coverage of organizational preparedness during 1978. Opening the "Public Forum" section of the paper to letters addressing quake preparedness on June 3, 1978, also contributed to the visibility of this topic. In all, sixteen reports appeared in the Valley News in 1978 touching upon some aspect of organizational preparedness. This compares with four articles each in the Outlook and Tribune.

Individual preparedness. Coverage of individual preparedness in the community papers was essentially the publication and republication of the Fil Drukey series "Common Sense and Earthquake Survival". The series of ten articles was first featured in the Santa Monica Evening Outlook from November 22 to December 2, 1976, then in a single "Special Earthquake Section" in the Tribune on January 13, 1977, and finally, in the Valley News between

January 30 and February 11, 1977. In all three English language community papers, coverage of recommendations on how to protect oneself and property in an earthquake lagged behind organizational preparedness in total output of articles. Of the 71 articles in the Valley News on preparedness, 47 (66%) were devoted to organizational measures and 21 (30%) to individual steps (three percent were combined references to individual and organizational preparedness measures). Nearly half of the articles on individual preparedness in the Valley News were authored by Drukey. The Tribune, which produced fewer preparedness reports (54) than the Valley News, nearly equaled the latter in articles on individual measures (20). Thus a greater proportion (37%) of the Tribune's preparedness coverage was devoted to individual measures. Fifteen of the Tribune's twenty reports on individual preparedness were part of the January 13, 1977, special earthquake edition. The Outlook offered just fourteen articles over the entire monitored period on individual precautions, ten of which were authored by Drukey.

Figure 3 reveals that the distribution of reports on individual preparedness is concentrated in the November 4 to February 23 period coinciding with publication of "Common Sense and Earthquake Survival". Actual content of the Drukey articles has been elaborated in detail elsewhere and will not be treated here. Other reports which mentioned actions that could be taken by individuals to safeguard themselves in the event of an earthquake did appear from time to time. One aspect of quake preparedness which recieved media attention in the aftermath of Minturn's forecasts was the psychological impact of natural disasters on children. Children's fear of earthquakes was the topic of three reports, two in the Valley News and one in the Outlook. All three featured the work of Dr. Steven Howard of the San Fernando Child Guidance Center and his recommendations to parents on how to help their children cope with earthquake



INDIVIDUAL PREPAREDNESS ARITCLES IN FOUR WEEK PERIODS
JANUARY 1, 1976 TO DECEMBER 31, 1978

FIGURE 3

anxieties (Valley News, 12-16-76, 12-19-76; Outlook, 12-18-76). Other topics included announcements of films and lectures on aspects of individual preparedness and the availability of government and private disaster agency pamphlets. Insurance companies advertised earthquake policies and manufacturers promoted earthquake alarms, water storage containers and gas shut-off valves.

Panic was mentioned in the context of individual preparedness in several articles. All of these reports included the admonition to individuals "not to panic in an earthquake" and then provided specific precautions, e.g., take cover in a door frame or under sturdy furniture. It was apparently assumed that if people knew what to do that irrational reactions could be greatly reduced. Consider this excerpt from one of the Drukey articles entitled "Panic More Harmful Than Earthquake":

> Panic could easily claim more lives than an earthquake itself. Struck by a major tremor, frightened by its swaying and jilting, the ominous noise of groaning structures, the shattering of glass and crashing of shifting objects, your instincts tell you 'scream and run!' Try to defy those impulses. The urge to run is contagious . . ., in a crowded situation, to rush without thinking is to encourage irrational behavior.

Elsewhere she writes:

> . . ., if we can prepare ourselves to react automatically, we can replace panic and indecision with appropriate action to save lives and reduce property damage.

Although articles other than those authored by Drukey contained mention of panic, there did not appear to be a pattern of reference to panic in any one of the community papers or in the community papers in relation to the metropolitan dailies.

Building safety. The building safety issue was one in which the Valley News offered significantly greater coverage than either of the other two English language community papers. Spanning the entire three year period of study, the Valley News offered thirty-nine reports, the Tribune and Outlook

thirty each. The Valley News also included the largest number of published letters to the editor and editorial essays with five. The Outlook contained two commentaries and the Tribune one. The San Fernando Valley quake of 1971, so often invoked in Valley News discussions of earthquake topics, was a highly visible theme in its coverage of building safety.

There was considerable variation in the events and developments reported in the context of building safety among the three community papers. Two events which received widespread publicity throughout metropolitan Los Angeles provide a basis for comparison of the three papers. These were the issues of how to deal with older quake endangered buildings and whether or nor an LNG facility should be located at Point Conception. The Valley News contained the most reports on Los Angeles' old building woes with 13, the Outlook carried eight and the Tribune, showing little interest in the controversy, offered just four.

The Valley News was the only community paper to cover the old building issue in the period preceding discovery of the Uplift (1-29-76). Outlook coverage was initiated on April 12, 1976, in conjunction with interpretation of the Bulge. The Tribune first mentioned the problem posed by unreinforced masonry buildings in a report on the Whitcomb forecast. Dr. Ralph Turner of UCLA was quoted as saying that renovation or destruction of the buildings should be a high priority due to the threat of a major quake posed by the Uplift and the Whitcomb data (4-23-76). Three of the six feature articles collectively entitled "Earthquake Country: Are We Ready" by Valley News staffer Arnie Friedman discussed the building controversy (4-4-76, 4-8-76, 4-11-76). Friedman, clearly in favor of some action to alleviate the danger posed by the structures, repeatedly reminded his readers that the Earthquake Commission, assembled in the aftermath of the 1971 Valley quake, had declared the old

buildings the most serious threat to public safety. His estimate that there were 22,000 such structures in the City of Los Angeles later proved to be far too high as most estimates settled on a figure of 14,000 (a later count revealed there to be about 8,700). All significant developments in the City Council's deliberations and decisions on the old building question were reported in the Valley News. The Outlook covered most of these developments but its reports lacked the comprehensiveness of those in the Valley News, particularly Friedman's feature articles which placed the issue in the context of area quake history and other preparedness and safety issues. The Tribune reported only the eventual outcome of the old building controversy, the City Council-approved four point program (1-19-77).

Coverage of the LNG siting issue was somewhat more uniform among the three community papers. The Tribune contained ten articles, eight appeared in the Valley News and six in the Outlook. All three papers covered the most important meetings, announcements and decisions. Both the Valley News and the Outlook published editorials endorsing construction of the facility at the Point Conception site. The Tribune took no official stand on the matter but offered more extensive coverage of the Indian protests and other objections to use of the site than either the Valley News or Outlook.

Beyond these topics common to all three community papers, there was some diversity which reflected local concerns or special emphases. Santa Monica had a public discussion of the future of approximately 250 unreinforced buildings within its city limits. The solutions sought and opposition encountered closely paralleled developments in Los Angeles. The issue was covered by the Outlook in six reports between September 13, 1976, and March 21, 1978. The Valley News devoted seven articles to the controversy surrounding the relocation of Rinaldi Elementary School. The Valley News announced the opening

of several buildings which had been constructed to replace those destroyed by the 1971 quake. Included were the Sylmar Juvenile Hall (9-20-78) and the Olive View Medical Center (9-14-77). The Tribune offered several reports featuring engineering studies undertaken to improve structural safety.

Dam safety. Coverage of dam safety in the community papers mostly found reports treating some aspect of earthquake threat to a specific facility. The dams under scrutiny were, for the most part, located in the area corresponding to the paper's circulation. The San Gabriel Valley Tribune offered the most extensive coverage of dam safety with forty reports. Most of the eighteen dams under the jurisdiction of the LA County Flood Control District are located in the San Gabriel Mountains. The Tribune, serving a community threatened by inundation from several dams in the event of a major tremor, may be more sensitive to issues of dam safety. The Valley News, with 28 articles over the three year period, also reflected a concern with dams in its midst. The near collapse of the Van Norman dam in 1971 was a frequently invoked reminder of community vulnerability. It was perhaps the most important factor in an editorial campaign on behalf of dam evacuation planning. The Valley News produced the largest number of reports containing combined reference to other substantive categories, including prediction, building safety, and preparedness, indicating a tendency on the part of that paper to treat dam safety in a somewhat broader context.

The Auburn dam controversy, the most heavily publicized of dam safety issues, was not uniformly reported in the three community papers. Coverage by the Tribune, which devoted eighteen reports to the Auburn controversy, was more typical of the metropolitan dailies than the other community papers. The Valley News contained just two reports and the Outlook, which reflected a negligible interest in dam safety generally, also published two reports.

The community papers devoted considerable coverage to the safety of dams in the areas they served. The Tribune devoted eleven reports to the debate over transfer of the Morris Dam in San Gabriel Canyon from the Metropolitan Water District to the LA County Flood Control District. Controversy centered on whether the dam, built in 1930, could be brought up to current seismic safety standards without great expense to the county. The dam was considered by San Gabriel Valley officials as a means of reducing the impact of the drought. The Valley News demonstrated its concern for local dam safety with several reports on the Boquet Canyon Dam and the Pacoima Dam. The Bouquet Canyon Dam underwent a structural stability review to determine whether it could stand the shaking of an uplift-related quake (4-25-76, 4-27-76, 6-15-76). The Valley News also detailed the efforts of County Flood Control maintenance crews which worked to strengthen a mountain bracing the Pacoima Dam which was badly fractured by the 1971 tremor (11-13-77, 11-20-77, 2-13-78).

Nuclear power safety. Nuclear power was an issue all but ignored in the Valley News which offered just seven reports in three years. In contrast, the Outlook contained twelve and the Tribune twenty-five. The most newsworthy nuclear safety issue encountered between 1976 and 1978 was the controversy surrounding the licensing of the Diablo Canyon plants. The Tribune presented the most complete coverage of this issue with eleven reports. The Outlook published two and the Valley News, one.

Despite its minimal interest in nuclear power safety, the Valley News did devote two reports to the nuclear power initiative, Proposition 15. A position on the issue was not taken by the paper editorially, however. The Valley News was the only community paper to mention the Palmdale bulge in connection with nuclear power safety. An April 9, 1976, report quoted Ralph Nader, who advocated the closing down of all nuclear power plants in

California until fault lines near the facilities could be fully studied. Nader cited the threat posed by the Uplift and the inevitable great earthquake as reasons for a shut down.

Summary and Conclusions

Based upon close scrutiny of earthquake coverage in the Valley News over a three year period, one cannot overestimate the importance of the San Fernando Valley's recent experience with a damaging earthquake. The 1971 tremor sometimes entered the news almost as an afterthought. For example, a woman who wrote a letter to the editor complained about the fire hazard posed to her home by brush and trash which had accumulated in vacant lots nearby. She insisted that the fire department send an inspector. The lots near her home were vacant, she noted, due to the 1971 quake. The Valley's "killer quake" was also remembered more directly. In each of the three years the paper was monitored, anniversary articles appeared commemorating the quake. These reports contained a strong undercurrent of community pride; hardship and suffering had been faced bravely, rebuilding had taken place, and the entire metropolitan area was rendered safer from earthquake due to the many lessons learned after the 1971 disaster.

The 1971 quake played an important role in the emphasis in the Valley News on preparedness, building safety and dam evacuation planning. Although disaster contingency plans existed prior to the quake and were executed when it struck, many difficulties plagued these response efforts. Poor coordination between relief agencies, breakdowns of communication and a lack of overall leadership were among the problems experienced. With discovery of the Uplift and Whitcomb's forecast for another Valley quake, one perhaps as large as the earlier shock, these concerns with agency response were reflected in coverage

by the Valley News. The emphases upon building and dam safety also have roots in the experience of the 1971 quake. A great majority of the deaths and injuries were caused by collapsing buildings; 49 were killed in the collapse of the VA Hospital. When it was discovered that the Van Norman dam had been badly damaged, 80,000 residents were evacuated. Reference to the 1971 quake experience was not limited to these areas of special emphases, but permeated all earthquake topics.

Perhaps the two most significant features of Valley News quake coverage during the three year period were the six part Friedman series in April, 1976, and the editorial campaign on behalf of dam evacuation planning extending from December, 1977, to December, 1978. Both drew heavily from the experience of the San Fernando Valley quake. Friedman's essays were the earliest and the possible implications of a massive Bulge-related earthquake. In detail, they rivaled the well researched and written feature articles in the LA Times by George Alexander. The inclusion in each of Friedman's articles of multiple topics, particularly prediction and preparedness themes, seemed to typify a trend in the Valley News toward more integrated and comprehensive reports.

The vigorous editorial advocacy of dam evacuation planning was a unique feature of the Valley News and also based upon the experience of the Valley community with a near dam failure and precautionary evacuation. The issue drew six separate editorial essays, the largest number devoted to any subject in the community papers and rivaling the editorial campaign for building safety in the LA Times. The commentaries were sufficiently numerous and urgent in tone to attract comment and reassurance from the director of the State Office of Emergency Services.

The Valley News, with its decidedly local orientation and service to a community with vivid recollections of the devastation an earthquake can generate, presented earthquake related news in a unique manner. This unique slant is reflected in an emphasis upon those aspects of disaster planning which correspond to the perceived needs of the community.

CHAPTER FOUR

THE SAN FERNANDO EARTHQUAKE DAMAGE ZONE

The San Fernando earthquake of 1971 was felt as an extended period of violent shaking throughout Los Angeles County with substantial building sway in central Los Angeles. Books and other objects were shaken down from shelves and minor property damage occurred throughout the county. Many people were awakened by the early morning quake. Communications to the main impact zone were interrupted, so early reports were confused and generally failed to recognize the extent of the tragedy. After a few hours and in the days after the main tremor, three consequences of the quake stood out in public awareness. First was the destruction of a hospital which claimed most of the lives lost in the earthquake. Second was the suspense which lasted for several days over whether the Van Norman Dam would collapse and inundate thousands of single-family suburban residences in the San Fernando Valley. And third was the destruction of the freeways that provided the major access to northern California, the high desert, and the most popular winter sports areas. The ruins of collapsed freeways interchanges remained for several years as visible reminders of the 1971 catastrophe. The media typically feature pictures and other reminders on each anniversary of the earthquake. And the typical earthquake "special" begins with the 1906 San Francisco earthquake and then moves to the most recent American earthquake disaster in San Fernando and Sylmar.

While awareness of the San Fernando earthquake is undoubtedly part of the collective memory of most residents of Los Angeles County, direct experience with serious damage and casualties was quite localized. For many people the quake may even have been reassuring. A frequent argument against application of strict seismic safety codes to old buildings is that they have already proved their soundness by surviving several severe earthquakes. The analysis in Part Five has already suggested that merely having extensive experience with

earthquakes may enhance interest in media discussions of earthquake topics, but probably has no effect on personal preparedness. Having personal experience with damage or casualty from an earthquake, on the other hand, appears to enhance preparedness both directly and indirectly by fostering discussion of family preparedness. Hence there is reason to suppose that the effect of the San Fernando earthquake on residents of the principal damage and evacuation zones is more pronounced or even qualitatively different from the effect on residents in other parts of the county.

Characterizing the Sample

From Chapter Two we recall that residents of the San Fernando earthquake impact zone are not significantly different from the control sample in age or any of the three indicators of social stratification, so it is unnecessary to employ the analysis of covariance procedure used with the old-buildings and combined hazard zones. However the San Fernando zone is ethnicly distinctive in being overwhelmingly White Anglo in composition. The most satisfactory way to control for ethnic distinctiveness of this sort is simply to eliminate from the analysis all except White Anglos in both the San Fernando zone and the control sample. Any other procedure would involve comparing Blacks and Mexican Americans in the San Fernando sample with their counterparts in the control sample. But with numbers so small, individuality would outweigh ethnicity and the comparisons would be meaningless.

The complete list of variables entered into the comparison without holding ethnicity constant was presented in Table 2 of Chapter 2. The variables on which the San Fernando zone sample differed significantly from the control sample are presented again in a briefer Table 1 in this chapter. In addition, Table 1 indicates which of these differences remained significant when the comparison is restricted to only the White Anglo members of two samples.

It is essential when reading Table 1, however, to bear in mind the nature of the many variables reported in the earlier table for which the San Fernando zone sample does not differ from the control sample.

As we should expect, the San Fernando sample report significantly more intense experience with earthquakes and a significantly larger proportion have personally experienced earthquake damage or injury or have friends or relatives who have had such experience. They do not differ on home ownership, reading a newspaper regularly, or having relatives nearby. But they are less likely to belong to organizations in the immediate vicinity. In the latter respect they display an oft noted characteristic of suburbanites. These three background differences are unaffected by controlling ethnicity.

Only two weak differences in significant orientations emerge, and both of these disappear when ethnicity is controlled. On such matters as fatalistic attitude toward earthquake damage, appreciation of science, confidence in scientific prediction and nonscientific forecasting, and trust in scientists and officials, San Fernando zone residents are representative of White Anglos in the control sample.

Again only two weak differences in earthquake communication patterns appear and only one of these survives the ethnic control. One might have expected the memory of the Van Norman Dam threat and the more recent discussion of rebuilding a safer dam to have made dams and flooding a salient topic for discussion. But even this difference ceases to be significant when only White Anglos in the two samples are compared, so our expectation is disconfirmed. On the other hand the weak tendency for San Fernando zone residents to glean earthquake information from a wider range of media sources, suggesting greater interest and sensitization to earthquake matters, withstands the control for ethnicity. This slight indication of interest and sensitization is strictly passive, since it is not translated into the more active discussion of earthquake

TABLE 1

SIGNIFICANT DIFFERENCES BETWEEN SAN FERNANDO EARTHQUAKE DAMAGE ZONE AND CONTROL SAMPLES: ANALYSIS OF VARIANCE

Variable compared	All ethnic groups	White Anglos only
Personal characteristics and earthquake experience		
Groups, organizations nearby	(-).01	(-).01
Earthquake experience index	.01	.01
Damage to self or friends	.01	.01
Significant orientations		
Earthquake invulnerability	(-).05	--
Folk signs: earthquake weather	(-).05	--
Communication		
Number of media sources	.05	.05
Topic discussed: Dams, flooding	.05	--
Earthquake hazard awareness		
Awareness of Uplift	.01	--
Meliorability of group risk	(-).05	--
Self in group at risk	.05	.05
Is fault nearby	.05	--
Hazard reducing action		
Buy insurance	.01	--
Measures taken and planned	.01	.01
Taken for future earthquake	.01	.01
Government expenditure for hazard reduction (inclusive)	.05	.01
Expenditure for prediction and warning systems	.05	.01
Number of suggestions for government action	.01	.01
Type of suggestions: Emergency preparadness	.01	.01

topics. It may, however, constitute a latent sensitization that could easily be translated into more active communication behavior in case of more strongly precipitating events than occurred in the year before our interviews.

Differences in hazard awareness are principally attributable to ethnicity. The only substantial difference is in awareness of the Uplift, and this difference is explained by the more widespread awareness among White Anglos than among Blacks and Mexican Americans, rather than by residence in the earthquake zone. A slight skepticism about the meliorability of hazard and a slight tendency to believe there is a fault nearby are not statistically significant when only White Anglos are compared. Only a slightly more frequent identification of self as a member of a group disproportionately at risk persists whichever comparison is made.

Support for hazard reducing action is the realm in which several differences are found, and in which the differences apply as strongly to the ethnically controlled comparison as to the uncontrolled comparison. The differences apply to an orientation toward action rather than to actual steps taken, however. More people in the San Fernando zone say they have purchased earthquake insurance, but this is because they are White Anglos rather than because they live in the earthquake zone. They are no better prepared for an earthquake as individuals and households, but they more frequently say that they still plan to take the steps they have not yet taken, and they are more likely to attribute whatever preparedness they have achieved to the prospect of an earthquake. These findings persist whether we include or exclude the ethnic minorities from the comparison.

We have already observed this pattern in a weaker form. Our plausible interpretation stresses both hazard sensitization and normative pressure toward being prepared. It is reasonable to assume that a sense that one ought to be prepared, or at least that one is expected to be prepared, motivates the respondent who says, "No, I haven't taken that step, but I do plan to take it."

Sensitization to the need for earthquake preparedness seems to explain why one respondent attributes possession of a first aid kit or storing water to the prospect of an earthquake while another respondent attributes it to other concerns.

San Fernando zone residents have more ideas for government action and more strongly support government expenditure for earthquake prediction and the development of better warning systems. Since White Anglos generally are less enthusiastic about government spending than Blacks and Mexican Americans (Part Six), excluding the latter from the comparison allows the effect of residence in the San Fernando earthquake zone to be revealed even more clearly. And like the residents in the zones of old buildings, San Fernando zone residents are more likely to suggest forms of emergency preparedness in making suggestions for government action.

In summary, living in the zone of damage or evacuation from the 1971 San Fernando earthquake has very few effects on residents' earthquake attitudes and actions. The effects observed are passive rather than active, suggesting a sensitization to earthquake concerns and normative pressure and support for individual and government action to reduce the hazard. Like residents in old-buildings zones, San Fernando zone residents more often seem to think of earthquake preparedness in the down-to-earth sense of being ready to pick up the pieces rather than in the more idealistic sense of planned hazard reduction.

Is There a Localized Disaster Subculture?

For these few but interesting differences, a second important question must be answered. Do San Fernando residents differ because they lived through the earthquake and experienced the emotions involved in seeing their own or neighbor's homes damaged or in undergoing evacuation while wondering momentarily about

the fate of their homes, or do they differ because the memory of the earthquake is still vital in the affected neighborhoods and is institutionalized in various ways? The pair of questions corresponds to the life-situation versus subculture distinction used in analyzing ethnic differences. Residents of the San Fernando zone may share similar attitudes because most of them underwent the traumatic experience of 1971, and would have the same attitudes if they moved away, unless they moved to an area known to be free of earthquake threat. In that case residents who moved into the zone since the earthquake would not share the attitudes of long-time residents. The distinctive attitudes would be simply the persisting consequence of individual life situation in the recent past. On the other hand, attitudes generated in this fashion by the earthquake may have been diffused and communicated to newcomers, and kept vital by emergent symbols and discussion. Without continuing social support for distinctive attitudes, the individual who moves away from the zone would gradually become undistinguishable from people who had not experienced the quake. Here we are assuming that the quake produced a subculture which is kept alive and transmitted interpersonally and institutionally, and is symbolically anchored in the local area.

It is difficult to identify the counterparts of life situation and subculture empirically, and we do not have exactly the information best suited for operationalizing the distinction. But we can come reasonably close to separating life-situation from subculture effects. We shall make the effort in two steps.

The first step is to determine whether members of the San Fernando zone sample differ among themselves according to whether they experienced the earthquake or not. If the distinctive attitudes apply to residents irrespective of whether they were in the zone at the time of the earthquake, the evidence would point toward the effects of an earthquake subculture. If the distinctive attitudes are shared only by respondents who lived in the zone at

the time of the earthquake, the idea of a subculture would give way to a simple model of individual learning in a distinctive life situation.

We did not have the forethought to ask respondents specifically whether they lived in the principal damage or evacuation zones at the time of the earthquake, so we can only approximate the proper classification of respondents. But we did ask how many years respondents had lived in the same neighborhood. Anyone now in the San Fernando damage and evacuation zone who had lived in the same neighborhood for six or more years would qualify as having experienced the quake in the disaster zone. But some respondents who have lived in the same neighborhood less than six years may have moved from another neighborhood in the disaster zone, so the classification is imperfect. We also asked respondents to identify the most recent damaging earthquake they had experienced. By classifying respondents according to the double criteria of whether they named the San Fernando quake and how long they had lived in the same neighborhood, we are able to get some indication of how much difference there is in attitudes of earthquake zone residents according to whether they experienced the quake in the disaster zone or not.

The one person who lived six or more years in the same neighborhood but failed to mention the San Fernando earthquake was dropped from the analysis, leaving two categories with clear-cut meanings and a mixed category of people who have lived in the same neighborhood less than six years but report having experienced the San Fernando quake. Comparisons among three subsamples are presented in Table 2. Because the number of respondents who did not experience the San Fernando earthquake is small, we have reported subsample means even when the differences are not significant. Individually nonsignificant differences merit attention only if the pattern of differences is consistent for several variables.

The first three items serve merely to supply some validation for the subclassification. People who have lived longer in the same community have

TABLE 2

SELECTED DIFFERENCES AMONG SAN FERNANDO EARTHQUAKE DAMAGE ZONE

SUBSAMPLES: ANALYSIS OF VARIANCE

Variable compared	Significance of differences				Subsample means		
	Overall	A:C	B:C	A:B	A 6 + years SF quake	B ∠6 years SF quake	C ∠6 years - -
Groups, organizations nearby	.01	.01	NS	.01	1.17	.62	.56
Earthquake experience index	.001	.001	.001	NS	2.69	2.62	.52
Damage to self or friends	.001	.01	.001	NS	.86	.88	.56
Number of media sources	NS	NS	NS	NS	4.06	4.18	3.65
Awareness of Uplift	.01	.05	NS	.01	1.88	1.39	1.26
Self in group at risk	NS	NS	NS	NS	.17	.21	.24
Know whether fault nearby?	.05	.05	NS	.05	.76	.61	.56
Measures taken and planned	NS	NS	NS	NS	25.60	20.84	25.44
Taken for future earthquake	NS	NS	NS	.05	17.40	12.39	11.41
Government expenditure for hazard reduction (inclusive)	NS	NS	NS	NS	13.13	13.01	13.88
Expenditure for prediction and warning systems	NS	NS	NS	NS	6.43	6.25	7.06
Number of suggestions for government action	NS	NS	NS	NS	2.35	2.34	2.44
Number in (sub)sample	236				125	77	34

more organizational ties in the immediate vicinity than people who have moved more recently. Intensity of earthquake experience is nearly identical for the two groups who experienced the San Fernando quake and very much less for those who did not. But the observation that subsamples A and B do not differ in the proportion who have experienced personal loss directly or through close friends and relatives is surprising. We assume that many people in subsample B moved to the impact area after the earthquake, having directly experienced the San Fernando quake at only a benign level of intensity. An explanation for this characteristic of the mixed subsample calls either for having friends and relatives in the damage zone before moving there, or making friends after moving there with residents who suffered damage during the earthquake. Both have undoubtedly occurred. The influence of newly made friends who previously suffered loss in the earthquake seems a more plausible explanation for the majority of cases, expect that friend-making should have had a similar effect on subsample C. Consequently the most defensible interpretation seems to be that the members of subsample B were mostly either residents of the damage zone or had close ties to damage zone residents at the time of the San Fernando earthquake.

The subsamples do not differ significantly on the use of media sources for earthquake information, but the apparent differences are in the direction suggested if attention to media treatment of earthquake topics were a matter of individual earthquake damage experience. Differences in awareness of the Uplift and thinking one knows whether there is a fault nearby vary significantly, while placing oneself in a group at risk does not. The most consistent support for the subculture hypothesis comes from personal preparedness measures taken and planned and support for government preparedness action.

This first step leads us to the tentative conclusion that both processes are in operation. The clearest case for the effect of individual experience

is provided by awareness of the Uplift. A similar pattern for knowledge of the proximity of a fault might more plausibly be explained by the greater length of time that members of subsample A have lived in the same community. The tendency to attribute preparedness to concern over a future earthquake also follows the individual experience pattern. By contrast, expressing the intention to make further preparations, supporting government expenditure, and having ideas about what government should be doing follow the subculture pattern.

To complete the analysis it is plainly necessary to combine the subsample comparison with the comparison between San Fernando earthquake zone and control samples into one operation. Trial comparisons using counterpart subclassifications of the control sample were excessively cumbersome and raised too many questions concerning the comparability of similarly classified cells in the two samples. Eventually we settled on a simplified procedure. Instead of length of residence in the same community and whether or not the respondent had experienced the San Fernando earthquake, both of which were ambiguous indicators for our purposes, we used simply the index of personal earthquake damage experience. The index was dichotomized so as to separate respondents who had personally experienced damage or injury in an earthquake or through close friends or relatives from respondents who reported no such experience. We then conducted a two-way analysis of variance to measure the independent and combined effects of the personal experience of earthquake damage and the effect of living in the San Fernando earthquake damage zone at the time of interview. The results of this analysis are reported in Table 3.

We note first that interpretation is simplified by the absence of any two-way interaction effects. The lesser involvement in nearby groups and organizations is revealed appropriately as strictly an aspect of suburban life, while the clarity of the comparison is underlined by the fact that

TABLE 3

EFFECTS OF LOCATION AND PERSONAL EXPERIENCE OF

EARTHQUAKE DAMAGE: TWO-WAY ANALYSIS OF VARIANCE

Variable compared	Significance of F-ratio		
	San Fernando versus control zone	Personal experience with earthquake damage	Two-way inter-action
Groups, organizations nearby	.001	NS	NS
Earthquake experience index	NS	.001	NS
Number of media sources	NS	.002	NS
Awareness of Uplift	NS	.031	NS
Self in group at risk	.044	NS	NS
Know whether fault nearby?	NS	NS	NS
Measures taken and planned	.002	NS	NS
Taken for future earthquake	.011	.002	NS
Government expenditure for hazard reduction (inclusive)	NS	NS	NS
Expenditure for prediction and warning systems	.003	NS	NS
Number of suggestions for government action	NS	.014	NS

earthquake experience is unrelated to location when personal earthquake damage experience is controlled.

Gleaning information about earthquake matters from a wider range of media sources, being more aware of the Uplift and its potential significance, and being able to offer more suggestions for government action all follow the pattern that indicates the effects of individual experience rather than subculture. Although three variables supply a scant basis for generalizing, they do suggest a common manifestation of a sort of generalized sensitization to the earthquake hazard, or a more serious interest in the topic. The experiences of an earthquake as personally traumatic may have the effect of motivating people to pay closer attention to items dealing with earthquake danger and earthquake safety.

Another three variables conform to the subculture-effects pattern. Stating the intention to make additional earthquake preparations, supporting government expenditure for prediction research and for improved warning systems, and perceiving oneself as belonging to a group especially at risk distinguish San Fernando damage zone residents irrespective of whether they have personally experienced earthquake loss. These items convey a more normative orientation, that the government should act and that individuals ought to be prepared, while being in a special risk group supplies some of the justification for the normative element.

One item, the tendency to ascribe measures already taken to a concern over future earthquakes, shows significant effects of both personal experience and subculture. On a strictly post hoc basis this response seems plausibly to combine the element of sensitization to earthquake concerns with the normative element of an obligation to prepare for an earthquake.

Comparing our two analyses we find that two items, namely knowing whether there is a fault nearby and inclusive support for government expenditure

for earthquake hazard reduction drop out as relating to neither residential zone nor personal traumatic earthquake experience. The greater number of suggestions for government action is diagnosed differently under the two analyses. The other six items are diagnosed similarly by the two analyses, enhancing our confidence in the results.

We do not find evidence in these data of a comprehensive or potent disaster subculture localized in the zones of 1971 earthquake damage and evacuation. We are left with very few differences between the people in these zones and elsewhere. Nevertheless, some plausible evidence for a modest but noticeable subculture effect has been adduced. The absence of heightened levels of interpersonal discussion of earthquake topics calls into question the most effective mechanism for establishment and maintenance of disaster subculture. But the fact that the items that ultimately provide support for the subculture hypothesis seem to incorporate a normative orientation toward earthquake preparedness lends plausibility to the conclusion that truly subcultural elements have been uncovered.

CHAPTER FIVE

THE SCOPE OF EARTHQUAKE THEMES IN LOCAL CULTURES

The aim of this part of the investigation has been to shed further light on what we learned in Parts Four and Five about the effects of earthquake vulnerability and earthquake experience on awareness and response to recent near predictions of a destructive earthquake. We hoped to accomplish this aim by concentrating on two specific kinds of vulnerability and experience with one specific earthquake, and by enlarging samples as necessary to increase the confidence we can place in the findings. We also introduced a critically different theoretical element by looking at respondents according to the characteristics of the zones in which they live rather than according to their individual and household characteristics. This approach makes zonal analysis from ecological theory in sociology applicable to our materials, the theory that apart from human intention the urban community becomes subdivided into natural areas that create distinctive environments for their habituees. It also accentuates the relevance of cultural theory, since the development of distinctive subcultures is assumed to be facilitated when people who share common life situations dwell in mutual proximity. In practice the theoretical ideal of separating ecological and cultural dynamics in the examination of urban natural areas has never been achieved or even approximated, though the distinction introduced in Part Six between shared life situations and common cultures is a highly compatible formulation.

The distinction between zonal characteristics and individual or household characteristics vanishes when we look at the subsample from zones of

potential inundation in case of earthquake-induced dam failure. Individual vulnerability in this case is based on residential zone. The distinction is applicable, though not absolutely, to the zone of old buildings. Some residents of this zone live in unsafe buildings while others do not. In this sense their individual life situations differ. What they share is the experience of living in neighborhoods where substantially larger proportions of the people are subject to vulnerable life situations. The question then becomes to what extent the zone is suffused with awareness and attitudes stimulated initially by living in a potentially unsafe building. The difference is not absolute, however, since the collapse of buildings may injure passers-by and guests in vulnerable homes, so that residents in safe structures may fear the collapse of nearby structures.

The distinction between zonal characteristics and individual or household characteristics becomes clearest when we look at the damage and evacuation zone of the 1971 San Fernando-Sylmar earthquake. Here we have people who were residents at the time of the earthquake and experienced damage, injury, or evacuation personally. But we also have residents who have moved into the zone since the earthquake and have no first-hand experience with the disastrous aspect of earthquakes. The question, then, is whether newcomers adopt the attitudes of residents who lived through the 1971 disaster in the zone of maximum impact.

In the study of individual and household characteristcs in Parts Four and Five we found only negligible evidence that earthquake vulnerability affected awareness, attitude, or behavior. The negative findings could be explained by the use of a faulty index of vulnerability. But we are reminded that hardly anyone claimed invulnerability to earthquake effects. The negative findings are more plausibly explained by assuming that the strong sense that

no one is immune overrides any sense of being especially vulnerable. But if potential effects of differences in individual vulnerability are overridden for the isolated individual or household, the concentration of the especially vulnerable in neighborhoods might lift awareness over a critical threshhold, whether the effects were diffused to other residents or not.

Personal or vicarious experience of earthquake damage or injury, on the other hand, appears to have a range of direct and indirect effects. These effects are especially interesting because the intensity of earthquake experience apart from suffering personal loss is not very predictive of awareness, attitude, or behavior. Because these effects are sufficiently clear and strong, they could plausibly be diffused into an earthquake subculture. In addition, theories of culture uniformly emphasize past experience as the foundation on which interpretations of potential future events are erected.

The concept of urban natural areas does, however, complicate our enterprise. Analysis would be simplified if the zones differed only by earthquake vulnerability and earthquake history, and by the effects they produced. We found that they differed ethnically, socioeconomically, educationally, and by age distribution. We reduced the effects of these variables statistically as well as we could, but the very process of controlling for such variables raises questions. If the zones of earthquake vulnerability and experience coincide to a considerable extent with natural areas, such socially significant characteristics as age, ethnicity, socioeconomic level, and education are integral aspects of the character of the natural area. In correcting for their differential incidence in the zonal subsample we have not corrected for the effect of their differential incidence in shaping a subculture for the natural area. Furthermore, these differences can be viewed most plausibly as byproducts or symptoms of a distinctive social history,

which is the more fundamental source of whatever is unusual in the way residents approach the uncertain prospect of disaster. The observation that the combined hazard zone includes several of the erstwhile high status and "high culture" residential areas, producing a sample of the oldest and best educated but not wealthy residents, is not disposed of by effecting demographic control of age, education, and income. We shall review the findings comprehensively with these considerations in mind.

For convenience we have assembled into one table all of the zonal differences from the control sample that remain statistically significant after the effects of age, education, occupational status, household income, and ethnicity have been removed (Table 1). Three very general observations can be made. First, an impressive array of important variables does not appear in the table at all. The key awareness variables, namely, awareness of the Uplift, predictive announcements remembered, and predictive announcements taken seriously, are not present. Neither fear and concern over earthquakes nor the sense of increased concern during the past year is included. And the zonal subsamples do not differ in the extent of personal and household earthquake preparedness. Living in a zone of heightened earthquake vulnerability or a zone of recent destructive earthquake experience has not affected the extent to which people are informed about recent predictive announcements, the amount of concern people feel over the earthquake threat, or the actions they have taken to improve their own survival chances. Our most general conclusion to this phase of the analysis must be that the most significant forms of awareness and response to the earthquake threat are unaffected by the earthquake vulnerability and experience characteristics of the zones in which people live.

TABLE 1

SIGNIFICANT DIFFERENCES BETWEEN THREE SPECIAL SAMPLES AND CONTROL SAMPLE, WITH EFFECTS OF AGE, SOCIAL STRATUM, AND ETHNICITY REMOVED

Variable compared	Old buildings	Combined hazard	San Fernando impact
Significant orientations			
Favorability toward science	--	.05	--
Accuracy of scientific prediction in future	--	.05	--
Earthquake invulnerability	(-).01	--	--
Communication			
Number of media sources	--	--	.05
Topic discussed:			
Quakes around world	--	.001	--
Old unsafe buildings	--	.05	--
Moving out	--	.01	--
Earthquake hazard awareness			
Awareness of groups at risk	--	.01	--
Self in group at risk	--	.001	.05
Know whether fault nearby?	--	.01	--
Is fault nearby?	.001	--	--
Hazard reducing action			
Measures taken and planned	.05	--	.01
Taken for future earthquake	.01	--	.01
Government expenditure for hazard reduction (inclusive)	--	.01	.01
Expenditure for prediction and warning systems	--	.01	.01
Number of suggestions for government action	--	.01	.01
Type of suggestions for government action:			
Structural safety	(-).01	(-).01	--
Emergency preparedness	.01	.01	.01
Scientific research	(-).01	--	--
Evaluation of government preparedness	.01	--	--

The second general observation is that there is almost no awareness of the potential danger of inundation. Los Angeles County is dotted with dozens of dams that are used for water storage and flood control. The safety of many of these dams in case of a major earthquake is an unknown quantity. Extrapolating from our sample to the total County population, between two and two-and-a-half million people live in the zones of potential inundation. Because people subject to this hazard live contiguously, one of the conditions most favorable for the development of collective awareness and collective behavior is present. Yet living below a dam has no effect that we have located on earthquake attitude and response.

Plainly, the issue of dams has received less public attention than the issue of old buildings, though more people are probably at risk from dam failure than from building collapse. Inundation maps have only just been prepared and they have not been publicized. Perhaps the fact that thought is only currently being given to identifying appropriate evacuation zones and routes and other emergency procedures accounts for the lack of both public and neighborhood attention to the problem. And there is no organized interest group whose special concern is dam safety as there is for building code maintenance.

Third, there is little consistency of effect among the three zones of old buildings, combined hazard, and the San Fernando earthquake. Only a disproportionate tendency to suggest improving search and rescue and other post-disaster response capabilities characterizes all three zones. While it is eminently plausible that a heightened sense of personal vulnerability could lead to greater concern with what happens <u>when</u> the earthquake strikes, a single variable is a slender reed on which to support a broad generalization. No pair of zones stands out as distinctly more similar than the others.

We concluded for each of the three zones that some minimal signs of social sensitization could be inferred from the evidence. An apparent awareness of being at risk because of old buildings may have reflected simply a greater awareness of the old building hazard among Blacks in one zone but not in the combined hazard zone. Combined hazard zone residents show more awareness of groups at risk and engage in more discussion of earthquake topics. Residents in the other two zones seem to reveal the operation of social pressures toward preparedness by claiming the intent to take further preparedness steps and by attributing more of the measures they have already taken to the earthquake threat. We can only speculate that these tendencies could mean a latent readiness to respond in case of a credible warning or emergency. In two of the zones there is greater support for spending money on improving earthquake prediction and earthquake warning systems, which again suggests that a higher priority is placed on earthquake hazard reduction as a government responsibility.

A more discriminating examination of the possible effects of individual experience and earthquake subculture was possible for the San Fernando sample, although the number of variables we could use in the analysis was small. Intimate experience with the disastrous effects of an earthquake explains heightened attention to media information on earthquakes, greater awareness of the Uplift, and offering more suggestions for government action, without these responses being diffused to other residents as part of an earthquake subculture. On the other hand, a tendency to view oneself as being more vulnerable to earthquakes than most people, a tendency to claim that one plans to take more earthquake preparedness measures than one has already, and support for government expenditure to improve prediction and warning systems are responses characteristic of residents in the zone, irrespective of

whether they have had intimate experience with earthquake damage and injury or not. A tendency to ascribe measures already taken to the earthquake threat seems to be both a zonal and an individual experience effect.

To what extent, then, are we justified in thinking of localized earthquake subcultures in residential zones where the risk from old buildings is unusually prevalent and where the memory of earthquake destruction and casualty persists? Because of the limited number of applicable variables and the limited intensity of responses it is clearly inappropriate to speak of earthquake subcultures. At most we can speak of an earthquake theme in a culture or subculture, and the differential incidence and elaboration of that theme. But if the theme is a cultural rather than a mass phenomenon, there must be evidence that it is socially transmitted within some identifiable community. There are three kinds of evidence we can use in judging whether shared characteristics are cultural characteristics. First, we have observed that certain characteristics can be plausibly interpreted as indications of normative pressure. The sense that one ought to be doing more than one is, and a tendency to ascribe commonplace prudence to the earthquake threat both are plausible symptoms of weak but nevertheless real social pressures. Second, interpersonal discussion among family, friends, neighbors, and coworkers should be a crucial medium for the diffusion of cultural elements. The disproportionate incidence of such discussion in only one of the groups tends to undermine the credibility of the cultural explanation. Nevertheless, the fact that each of the three groups satisfies either the first or second criterion lends some encouragement to the cultural interpretation.

The third kind of evidence for the cultural interpretation has to do with the use of the mass media. Comprehensive cultural diffusion and maintenance should involve both informal discussion and dissimination through

the mass media. Only in the San Fernando zone is there a wider than usual use of the media, and our analysis has shown this to be a function of individual experience rather than culture. The analysis of Valley News coverage in Chapter Three revealed a pervasive practice of relating earthquake events and issues to the memory of the 1971 quake and to the necessity to prepare for a future quake. The Valley News also placed proportionately more emphasis on organizational and governmental earthquake preparedness than comparable papers elsewhere. Thus, differential news coverage supports the heightened sense of vulnerability and the enthusiasm for government action. Perhaps it is because the Valley News does not stand out for its attention to individual preparedness that area residents are no better prepared than other residents of Los Angeles County, though the constant reminders of past and future vulnerability contribute to the sense that one should be preparing for the inevitable disaster. In general, then, there is at least suggestive support in the correspondence between patterns of newspaper coverage and those attitudes that are characteristic of area residents, irrespective of their earthquake experience for the conclusion that elements of a distinctive earthquake subculture are present in the San Fernando earthquake impact zone.

We have still not explored the alternative hypothesis that some of the characteristics that distinguish the zones are simply manifestations of natural-area subcultures, rather than chiefly reflections of the kind of earthquake vulnerability or experience prevalent in the area. If we have tapped three distinctive natural areas, in each of which the world is viewed through a distinctive set of variously tinted lenses, the approach to earthquake hazard may be no more than one expression of the comprehensive world view. It was not feasible to gather a sufficient range of personal information to identify world views directly. We are limited to speculating on the basis of map locations of our sample sites and informal knowledge of the communities

of Los Angeles.

The combined hazard zone includes several neighborhoods best labeled as transitional elite. Portions of Hollywood, Pasadena, Silver Lake, and similar districts occupy foothill areas, considered most desirable places to live a generation or two ago when the Los Angeles metropolitan region was beginning to fill up with people. Today, because of the location on or near foothills and the accessibility to the central city, land values are very high. But because the homes, though often handsome by earlier standards, are old, the structures are less desirable than the land. During their periods of ascendance, several of these communities acquired prestigious reputations and were the settings for local developments in literary and artistic culture. Ties of sentiment and culture have kept many older couples there and attracted younger residents who are more interested in a cultural tradition than in the current prestige of their neighborhood. At the same time, the old homes in desirable locations undergo attrition, to be divided into rental units or replaced by apartment structures, which attract a different kind of population. It may well be an expression of the cultural and intellectual traditions of these natural areas that accounts for the more prevalent discussion of earthquake topics and the greater awareness of groups that are exceptionally vulnerable. We can assume that the world view most characteristic of these natural areas would be more deeply rooted in the history of southern California than the world views in other areas, and the awareness of especially vulnerable groups and the interest in discussion of earthquakes may stem from this local history perspective.

The San Fernando earthquake zone is suburbia par excellence. The sense of history here is less likely to extend back much before the San Fernando earthquake, and certainly not before the 1950s when the Valley expansion took place. Neighborhood linkages exist primarily through children, and

orientation for information is toward the media. There is no tradition of serious culture as a setting for discussing earthquakes. For many, this region of the San Fernando Valley is the neighborhood they have moved up to after starting out in a preponderantly working class neighborhood. Preoccupied with their own upward mobility on a scale of material well being, residents can be sensitive to risks in their own situations without being disproportionately sensitive about the special vulnerability of others, nor unusually altruistic.

The old building zone is harder to characterize, except that it is disproportionately weighted with central city neighborhoods. The neighborhoods are often of the same vintage as the combined hazard zone neighborhoods, but homes were often less elegantly built originally and neighborhoods have less in the way of distinctive reputations and desirable foothill locations to slow down the ecological processes of deterioration and succession. They may be more anomic, except as they are broken down into solidary ethnic and racial communities. Thus, Blacks in these neighborhoods have been sensitized to the problem of old buildings through ethnicly pitched political discourse, but others in the zone show no distinctive sense of earthquake vulnerability in spite of the concentration of old buildings. Nevertheless, without feeling that their situation is exceptional, they do feel vulnerable to earthquakes as indicated by the sense that they ought to be better prepared than they are.

The foregoing discussion is strictly an exercise in speculation, to suggest how these data might have been examined had we been able to gather appropriate data initially. It serves primarily as a recommendation to other investigators interested in community response to earthquake warning to build the concept of natural areas of the city into the theoretical foundations of their investigations.

There is another alternative formulation that might fit our data more adequately than the formulation concerning zonal subcultures. A culture may be thought of as a mix of exemplary patterns and prescriptions, resources and a map. Customs, values, mores and similar elements are familiar examples of exemplary patterns and prescriptions. Resources are the tools, including strategies and techniques, that are available for coping with a wide range of situations. As a map, the culture identifies figure and ground in the world of experience and identifies the special significance of objects, places and experiences. The important feature of a map is that it alerts the reader to respond differently under different circumstances.

The concept of culture as a map is important because it allows us to explore the possibility that the different responses we find in different zones are the manifestations of a common culture whose carriers are responding to the various ways in which the zones are identified on the master map. We may have been on a false course in thinking of distinctive zonal subcultures. The all encompassing map would enable us to deal with the anomaly that residents in two zones seem to be under normative pressure to prepare their households for an earthquake, but report only average levels of discussion of earthquake topics with their family, friends and coworkers. The social pressure might arise from the fact that something about their local situation is singled out on the map supplied by the larger culture. It would also enable us to deal with the fact that feeling oneself to be a member of an especially vulnerable group does not imply any disproportionate awareness of especially vulnerable groups--even of the group in which significant numbers include themselves.

From this point of view there may be an <u>earthquake awareness</u> theme in the regional subculture of southern California. This subculture is not restricted to any zone within southern California, but is shared throughout

the County and environs. Awareness of the vulnerability of old buildings is prevalent throughout the County, and is no more prevalent in neighborhoods where such buildings are clustered than in the County at large. The memory of the San Fernando earthquake is similarly stamped in the cultural tradition of the County and is not restricted to the damage zone. Old brick buildings and the San Fernando damage zone are starred on the cultural map, so people who frequent the appropriate areas feel that they are in special danger and feel that they ought to be doing something to protect themselves from the earthquake threat.

This conception provides a more plausible explanation of some of our findings than the concept of zonal subcultures or subculture themes. Combined with the idea of natural area subcultures and ethnic or racial subcultures through which the earthquake threat is given a distinctive slant, it may explain most of our findings. However, insofar as there are institutional mechanisms such as the San Fernando Valley News that foster earthquake awareness rooted in the unique and recent earthquake history of the area, the idea of a distinctive earthquake theme contributing a subcultural distinctiveness to the San Fernando earthquake impact zone may continue to enlarge our understanding.

A final question remains to be posed. The overarching purpose of the entire investigation was to examine the response to recent earthquake harbingers. To what extent are the patterns we have discerned in the four zonal subsamples responses to the announcement of the Uplift and other near predictions and forecasts in 1976? Unfortunately we cannot answer that question conclusively. On the negative side we note that none of the subsamples exhibits disproportionate awareness of the Uplift or of other predictive announcements. It would not be inconsistent with other evidence in the investigation, however, to conclude that the 1976 announcements triggered

a limited awareness and response pattern which quickly became detached from the memory of specific announcements. It is perhaps more difficult to discount as negative evidence the finding that none of the subsamples differs from the control sample in the frequency with which people say their concern has increased during the preceding year. There is no disproportionate sense that whatever concern people feel about living in or among old buildings or living at the site of damage or evacuation in the last destructive earthquake was heightened by events of the previous year. Thus, we can only conclude by observing that we have found no evidence tending to suggest that the distinctive response in these zones were elicited by the announcement of the Uplift and other near predictions and forecasts during 1976.