Planned Schedule Changes

Another issue addressed in several of the pre-December surveys was whether or not respondents planned to make any changes in their schedules in response to the earthquake forecast. The responses to items of this type are summarized in Table 3. Two surveys (Farley et al., 1991a, b; Showalter, 1991) asked respondents whether they planned to change their normal schedules or routines in any ways in response to the earthquake forecast, and in both of these surveys, around 30 percent said "yes." Two surveys (Farley et al., 1991a, b; Sylvester, 1991) - both conducted largely or entirely in the St. Louis area - also asked respondents directly whether or not they planned to leave the area due to the earthquake forecast. In Farley et al.'s October survey, 6.5 percent indicated they had such plans; in Sylvester's survey a month later, 3 percent indicated such plans. Wetzel et al. (1991) did not ask people directly whether they planned any schedule changes, but did ask whether doing so was "smart" or "dumb," allowing for various gradations of smartness or dumbness as shown in Table 3. They found that 38 percent saw this as smart in varying degrees, 30 percent saw it as dumb in varying degrees, and 29 percent were neutral. Taken together, these statistics suggest that a very sizable minority of area residents were planning or considering schedule changes due to the forecast, though the proportion who planned to leave was much smaller.

Of course, planning schedule changes is not the same as actually making them. As noted above, our follow-up survey indicated that fewer people made changes than had planned to do so. The only other follow-up survey reported at the conference that addressed this issue was that of Wetzel et al. (1991), who found somewhat larger percentages of their college student population having made schedule changes than we found in our general population sample. This difference may be attributable to differences in the populations. It does appear that the percentage of Wetzel et al.'s respondents who reported having made schedule changes was smaller than the percentage who had earlier said that it was at least somewhat smart to do so.

Long-Term Quake Likelihood

As shown in Table 4, a number of the surveys asked respondents how likely they thought a major earthquake was to occur over a longer time frame, ranging in various surveys from 5 years to 20 years. Consistently, the surveys indicate widespread awareness that the region may experience a damaging earthquake within the next decade or two. Seismologists have variously estimated the chances of an earthquake on the New Madrid Fault of Richter magnitude 6.0 or greater during the 1990s at from 13% to 65%. The surveys consistently indicate awareness of this risk, and show that a sizable majority of respondents actually <u>overestimated</u> the likelihood of a damaging New Madrid quake. In the Wetzel et al. (1991) survey, for example, 12 percent thought a magnitude 6.3 or greater quake was "certain to happen" by the year 2000, and another 37% thought such a quake was "very likely." Also, about 13 percent of Showalter's (1991) respondents said there was a 100% chance of a

magnitude 6.0 or greater quake within the next 10 years. Finally, over half of Farley et al.'s (1991a) respondents saw a major quake as "very likely" within the next 10-15 years in October, 1990, a percentage which fell to around 35% by February, 1991.

Clearly, then, there is widespread awareness of the long-term earthquake risk in the New Madrid Seismic Zone. There may well have been some tendency to overestimate this risk at the time most of these surveys were taken, though Farley et al.'s February survey suggests that more realistic perceptions of the long-term risk may have developed following the Browning "false alarm." Significantly, almost all of the decline in "very likely" responses shifted into the "somewhat likely" category in this survey, and the combined proportion who thought a major quake "very likely" or "somewhat likely" remained almost constant around 85 percent of those surveyed in both the October and February surveys.

Earthquake Preparedness

In this section, we shall address the findings of the studies regarding various aspects of earthquake preparedness. We shall discuss insurance separately from other aspects of preparedness, because a particularly large number of the studies reported at the conference addressed this issue.

Earthquake Insurance. The studies are remarkably consistent with respect to findings regarding earthquake insurance. Every study conducted during the October-November period found that 50% or more of the respondents in

earthquake-prone areas reported having earthquake insurance. This pattern held for Memphis (Edwards, 1991), the St. Louis area (Farley et al., 1991a; Sylvester, 1991), Cape Girardeau and Sikeston, MO (Farley et al., 1991a), Southern Indiana (Kennedy, 1991), and small Missouri and Arkansas towns immediately adjacent to the New Madrid Fault (Showalter, 1991). The average response was around 55%. These percentages are higher than in California, which led some researchers to question their validity. It may, for example, be that some people do not really know whether they have earthquake coverage. Yet, the consistency of the figures is remarkable, and researchers (e.g. Kennedy, 1991) who spoke with insurance company representatives were told that sales of earthquake insurance were extensive. One possible explanation of why earthquake insurance may be more widely owned in the Midwest and Mid-South than in California is that it is far more expensive in California than it is in the New Madrid Seismic Zone.

It also appears that sales of earthquake insurance continued at least up to December 3, and that, following the predicted date of the earthquake, a higher percentage of people had insurance than at the time of most of the surveys discussed above. Farley et al. (1991b) and Kennedy (1991) asked about insurance in follow-up surveys in February and April respectively, and found that 73 percent of Southern Indiana respondents and 71 percent of respondents in a combined St. Louis area/Cape Girardeau/Sikeston sample had earthquake insurance by then. Also suggestive of the same trend is comparison of Farley et al.'s (1991a) October survey in the St. Louis area with Sylvester's (1991)

November survey. While the October survey found that 50.1 percent of St. Louis area respondents had purchased earthquake insurance, this percentage rose to 64% in the November survey.

Preparation/mitigation. The results of the various surveys, summarized in Table 6, show that most people think preparation is a good idea, and that a sizable proportion have taken at least some steps to prepare for an earthquake. In fact, most surveys that measured various actions that might be taken found that a large proportion of people had taken more than one action. In general, the highest proportion of people have taken the easiest measures, such as learning how to shut off utilities, storing food/water, having a working flashlight, and having a battery operated radio. Clearly, many of these are things that people would do anyway, even in the absence of a specific earthquake threat. However, at least one survey (Farley et al., 1991a) indicated clearly that those who believed the forecast were most likely to have taken such actions, and it also appears that the number of people who had taken such actions increased as the forecast date approached. Harder-to-take actions, such as structural alterations of homes and securing of water heaters and other hazardous objects, had been taken by fewer people. Nonetheless, the results as a whole suggest that 1) a norm in support of earthquake preparedness and mitigation has arisen in the New Madrid Seismic Zone, 2) many people have taken one or more actions to prepare for an earthquake, even if these are generally the easier actions to take, and 3) the Browning forecast, along with other events such as the Loma Prieta earthquake, does appear to have contributed to increased earthquake preparedness in the Midwest and Mid-South.

Content Analyses of Media Coverage

Two papers that were presented at the conference reported results from content analyses of media (primarily newspaper) coverage of the Browning forecast and public response to it. One paper (Dearing and Kazmierczak, 1991) reported a content analysis of 12 newspapers outside the New Madrid Seismic Zone while the other (Shipman, Fowler, and Shain, 1991) reported a content analysis of three newspapers in the New Madrid Seismic Zone. Both of these studies found that, on the whole, newspaper coverage of Browning's forecast tended to range from uncritical to supportive. This was particularly the case during the earlier part of the sequence of events. Dearing and Kazmierczak found that the most common type of article was subjective and supportive of Browning - the one among four possible types that the authors felt had the greatest potential to mislead the public. Shipman, Fowler, and Shain also found that most sources quoted in the articles they analyzed were either supportive of Browning or neutral. Of the ones that were critical, 75 percent appeared late in the sequence of events.

Two particular problems with press coverage emerge from these papers. First, the press was not generally proactive in seeking out scientists and getting their opinions. Audience discussion at the conference, however, posed a related problem - scientists may be reluctant to speak to reporters. Whatever the reason, Shipman, Fowler, and Shain clearly found that critical comments by scientists about Browning did not appear much in the newspapers until scientists began to respond to Browning's forecast in an organized way,

by holding press conferences and taking other initiatives to communicate to the press (which happened around October) that they did not see the forecast as valid. Second, a particular problem that may have contributed to the early spread of beliefs in the validity of Browning's forecast was that, in the early part of the process, the press uncritically reported that Browning had predicted the Loma Prieta earthquake and several others. By the time, much later, that the press had publicized the fact that this turned out not to be true, it had been so often-repeated and widely-believed that, to a large extent, the process could not be reversed. Had there been more thorough and critical investigation of Browning's initial claims of past success, his forecast for December might never have gained the credibility it did.

Impact of the Browning Forecast on Disaster Agencies

Two papers addressed the impact of the Browning forecast on the operation of disaster agencies. Stevens (1991) addressed the impact upon Memphis State University's Center for Earthquake Research and Information, and Gasparich (1991) discussed the impact on the Illinois Emergency Services and Disaster Agency's Earthquake Awareness and Preparedness Program. Both reported similar experiences, including 1) greatly heightened public awareness and response to the earthquake hazard in the New Madrid Seismic Zone, beginning with the Loma Prieta earthquake but greatly heightened by the Browning forecast, 2) overwhelming demand for speakings, information, center tours, etc., which required extensive training of extra or outside people, and which resulted in the postponement and severe disruption of routine activities that the agencies were normally expected to carry out, and 3) a dilemma

between, on the one hand, using the Browning forecast as an opportunity to enhance earthquake awareness and preparedness and, on the other, taking any action that might give credibility to what they viewed as a non-valid and non-scientific forecast that raised false expectations about the ability to forecast earthquakes. Significantly, both reported that they never mentioned the Browning forecast in their formal presentations, choosing instead to present their routine earthquake preparedness seminars or classes the same as they had always done - even though they knew that the first question would always concern the forecast. Finally, both presenters noted that, the day after the prediction failed to materialize, interest in their programs dropped to nothing, raising concerns about possible "cry wolf" or "we dodged the bullet" effects that could lead to a reversal of some of the gains made in preparedness.

Summary and Conclusions

The following conclusions appear to be warranted on the basis of papers presented at the conference:

1. The population was clearly divided concerning the validity of the Browning forecast, with the largest proportion of the public neither clearly believing the forecast nor clearly rejecting it, though significant minorities of the population did each.

2. The extent to which the forecast was believed was linked to demographics, specifically gender, education, and age. Women, younger people, and people with lower levels of education appear to have been more likely to believe the forecast than people with opposite characteristics, although all groups were divided.

3. People located closer to the New Madrid Fault appear to have been somewhat more likely to believe the forecast, and clearly were more concerned about a possible earthquake and the damage it might cause in their communities.

4. The perceived likelihood of an earthquake in the first week of December did not increase as the date of the predicted earthquake approached, and may have even decreased slightly. This may be attributable in part to more critical reporting concerning the forecast, and to statements of scientists in October and thereafter that Browning's forecast was not valid and that an earthquake during the first week of December was unlikely.

5. A sizable minority of the population of the New Madrid Seismic Zone - perhaps around one out of three - planned or seriously considered schedule changes around December 3. However, the number who actually made schedule changes was smaller, and many who did change their schedules did so at least in part in response to school closures.

6. Relatively few people (3 to 6 percent) planned to leave the area around December 3 because of the earthquake forecast, and even fewer appear to have actually done so.

7. There is clearly a widespread and heightened awareness of earthquake risk in the New Madrid Seismic Zone, and the Browning forecast, in combination with the Loma Prieta earthquake, appears to have contributed significantly to this.

8. Surveys consistently indicated that half or more of the population of the New Madrid Seismic Zone had obtained earthquake insurance by a month or two before the date of the predicted earthquake, and the number reporting that they had such insurance after the predicted date was even higher.

9. The majority of the population appears to have taken at least some steps toward preparedness/mitigation. The most common steps were the easiest ones to take, such as storing food and water, knowing how to turn off utilities, and having working flashlights and battery radios. It appears that to at least some extent, a norm in support of earthquake preparedness emerged in the area. On the other hand, it is too soon to tell how much of this will be lasting over the long run.

10. On the matter of how the public perceived the response of scientists to the Browning forecast, it appears that the perception was very mixed, with about half perceiving them as rejecting it (which the vast majority did), but almost as many believed that scientists disagreed among themselves about the forecast. However, this appears to have had relatively small effects on whether or not the forecast was believed.

11. Content analyses of the media indicated that, both within and outside the New Madrid Seismic zone, the media were quite uncritical of Browning and his forecast, and at times supportive. This was particularly the case early on, and with respect to his past record of having predicted earthquakes.

12. The forecast had a major disruptive impact on disaster agencies, but also gave them an unprecedented opportunity to communicate with the public regarding earthquake risk, preparedness, and mitigation.

In addition to the foregoing conclusions emerging from the conference, our own research findings support the following additional conclusions:

1. Interactions with and observations of the actions and plans of significant others were a very major influence over what people planned to do in response to the forecast - more so, in fact, than whether or not people believed the forecast.

2. To those for whose thinking it affected in one way or another, the minor earthquake of September 26 clearly led to increased concern and made the Browning forecast seem more believable. This suggests that if a minor earthquake occurs during a time of unusual public attention to earthquake risk, that attention will be further heightened.

3. Concerns about the possibility of a war with Iraq were associated with concerns about a possible damaging earthquake.

Table 1. Summary of Population Surveys Reported at Research Conference on Public and Media Response to Earthquake Fo Illinois University at Edwardsville, May 16-18, 1991.

D. Atwood, Clark, and Veneziano, 1991	
L. E. Atwood, 1991	RDD Telephone Survey, Cape Girardeau, Scott City, and Jackson MO, November 1-7, 1990, N=629. Tested for "Third Person Effect," i.e. perceived response of others to the forecast as compared to own response.
Baldwin, 1991	RDD Telephone Survey, Cape Girardeau, Scott City, and Jackson, MO, November 1-7, 1990, N=629. Addressed "Pluralistic Ignorance" phenomenon involving perceived response of others relative to the respondent's own response.
Edwards, 1991	Mail Questionnaire, City of Memphis, TN, N=1042. Addressed December quake likelihood, salience/awareness of earthquake risk, behavioral response to forecast, quake preparedness, perceptions of science.
Farley et al., 1991a*	RDD Telephone Survey in St. Louis MO-IL MSA (N=415), Cape Girardeau, MO (N=87), and Sikeston, MO (N=81), October 14, 15, 1990. Addressed perceived likelihood of December quake, planned schedule changes, preparedness.
Farley et al., 1991b	Follow-up survey to one listed above; addressed similar topics plus self-reported schedule changes and perceptions of science.
Kennedy, 1991	Statewide RDD Telephone Survey in Indiana, N=756, Conducted October 23 through November 26. Addressed December and long-term quake likelihood, probable damage from quake, and purchase of earthquake insurance.
Levenbach and England, 1991*	RDD Telephone Survey in Jonesboro, AR, N=491, Conducted in October, 1990. Measured earthquake preparation by a variety of predictors.
Major, 1991	RDD Telephone Survey in Cape Girardeau, Jackson, and Scott City, MO, November 1-7, 1990, with follow-up survey in last week of February, 1991. Assessed how changed situation (from events surrounding prediction to disconfirmation of thinking) affected communications behaviors of publics, as related to mass media and significant others.
Showalter, 1991	Mail questionnaire in Marked Tree and Wynne, AR, and New Madrid and East Prairie, MO. Survey sent to 250 in each town; actual N returned=303. Measured perceptions of Browning's qualification, probability of quake in next 10 years, assessment of how well-informed public was concerning New Madrid quake risk; planned schedule changes December 3 and earthquake preparedness.

Sylvester, 1991	RDD Telephone Survey in St. Louis MSA; N=435. Survey conducted Nov. 16-24. Measured beliefs regarding December quake likelihood, planned schedule changes, purchase of earthquake insurance.
Wetzel et al., 1991	Questionnaire administered to students at Rhodes College, Memphis State University, and Arkansas State University in modified Solomon 4-group design before and after December 3. Total N=375; N for complete data both before and after = 280. Addressed belief in prediction, perceived quake consequences, fear, preparation, perceived response of significant others. Key theoretical concepts: cognitive dissonance, stress/anxiety

Table 2. Perceived Likelihood of December Earthquake/Belief in Browning Forecast, from Population Surveys.

D. Atwood, Clark, and Veneziano, 1991		
L. E. Atwood, 1991	Believability of Forecast:	
	Very Believable	9.5%
	Somewhat Believable	50.4%
Edwards, 1991	Likelihood of Quake in Next 3 Months	
	Very Likely	6%
	Somewhat Likely	39%
	Not Very Likely	42%
	Not Likely At All	14%
Farley et al., 1991a, 1991b	Likelihood of Quake Around December 3	
	Very Likely	17.6%
	Somewhat Likely	38.6%
	Not too Likely	17.3%
	Very Unlikely	16.1%
	Don't Know	10.3%
Kennedy, 1991	Likelihood of Quake in Early December, on Scale of 1 to 10.	
	7-10 (Very Likely)	17.7%
	4-6 (Somewhat Likely)	46.8%
	1-3 (Not very Likely)	35.5%
Sylvester, 1991	"Do you think predicted earthquake will happen?"	
	Yes, it's possible	23%
	No, not likely	64%
	Not certain	13%
Wetzel et al., 1991	Likelihood of Quake First Week of December	
	Certain	<1%
	Very Likely	7%
	Somewhat Likely	21%
	As Likely As Not	46%
	Somewhat Unlikely	11%
	Very Unlikely	14%
	Will Never Happen	<1%
	If you had to guess one way or the other, the forecast . . .	
	Will come true	21%
	Won't come true	79%

Table 3. Plans to Make Schedule Changes in Response to Earthquake Forecast, from Population Surveys

D. Atwood, Clark, and Veneziano, 1991

Farley et al., 1991a, 1991b	Planned Schedule Changes Around December 3 Due to Earthquake Risk	
	Yes	32.2%
	No	65.4%
	Don't know	2.4%
	Planned to leave area around December 3	
	Yes	6.5%
	No	92.4%
	Don't know	1.1%
Showalter, 1991	Altering Normal Routine Around December 3	
	Report used bar charts so precise percentage cannot be determined, but appears to be around 30 percent yes, 45 percent no, and remainder don't know	
Sylvester, 1991	Have any special plans to be out of area December 3 should quake occur?	
	Yes	3%
Wetzel et al., 1991	Not going to work/class, leaving town, withdrawing extra cash is	
	Extremely dumb, a waste of time	3%
	Very dumb	8%
	Somewhat dumb	19%
	Neutral/neither smart nor dumb	29%
	Somewhat smart	24%
	Very smart	7%
	Extremely smart, serving a good purpose	7%

Table 4. Perceived Long-Term Likelihood of Damaging Earthquake on New Madrid Fault

D. Atwood, Clark, and Veneziano, 1991

Edwards, 1991

Likelihood of Damaging Earthquake

	In 10 years	In 1 year
Very likely	29%	10%
Somewhat likely	51	44
Not very likely	18	39
Not likely at all	3	8

Farley et al., 1991a, b

Likelihood of Major Earthquake Within Next 10-15 Years

	October	February
Very likely	51.0%	34.6%
Somewhat likely	34.9	49.8
Not too likely	5.5	9.3
Very unlikely	3.6	3.8
Don't know	5.0	2.4

Kennedy, 1991

Likelihood of Major Earthquake in Midwest in Next 5 Years, on Scale of 1 to 10.

7 - 10 (Very likely)	22.5%
4 - 6 (Somewhat likely)	48.8
1 - 3 (Not very likely)	28.8

Levenbach and England, 1991*

Items on likelihood of major earthquake in next 5 years and next 20 years were included in survey, but not reported in this paper.

Showalter, 1991

Perceived Chance of a Strong (Magnitude 6.0-plus) Earthquake in Region Within Next 10 Years

63% - 100% Chance	33%
43% - 62% Chance	52%
0% - 42% /chance	15%

Wetzel et al., 1991

Perceived Chance of a Major (Magnitude 6.3-plus) Earthquake on the New Madrid Fault Between 1990-2000.

Certain to Happen	12%
Very Likely	37%
Somewhat Likely	30%
Just as Likely as Not	17%
Somewhat Unlikely	4%
Very Unlikely	<1%
Never Will Happen	0%

Table 5. Earthquake Insurance

D. Atwood, Clark, and Veneziano, 1991

Edwards, 1991

Asked About Earthquake Insurance	56%
Bought Earthquake Insurance	53%

Farley et al., 1991a, b

Percentage Who Had Earthquake Insurance, October	54.1%
Percentage Who Had Earthquake Insurance, February	71.0%

Kennedy, 1991

Percentage With Earthquake Insurance On Home

	October/November, 1990	April, 1991
Northern Indiana	13%	23%
Central Indiana	34	46%
Southern Indiana	56	73%

Levenbach and England, 1991*

Item concerning purchase of earthquake insurance was included in survey, but frequency distributions for this item were not reported in this paper.

Showalter, 1991

Purchased earthquake insurance	41%
Already owned earthquake insurance	9%

Sylvester, 1991

Have earthquake insurance for home or business	64%
Purchased it after prediction	13%
Already had it	51%

Table 6. Actions Taken to Prepare for A Damaging Earthquake

D. Atwood, Clark, and Veneziano, 1991

L. E. Atwood, 1991	"Have you done anything to make your home safer if there were an earthquake?"		
	Yes	48%	
Baldwin, 1991	Used same survey instrument as L. E. Atwood, but does not report frequencies for this item.		
Edwards, 1991	Store food/water	37%	
	Learn first aid	45	
	Devise family plan	37	
	Have working flashlight	84	
	Have battery radio	70	
	Protect glass/dishes	11	
	Secure water heater	9	
	Give children instructions	44	
	Secure furniture	3	
	Have engineer assessment	4	
	Make structural changes	4	
Farley et al., 1991a, b	Fastened or Secured Objects	18.5%	27.6%
	Stored food/water	46.2	70.5
	Know how to shut off utilities	64.7	87.3
	2 or more actions (incl. insurance)	58.1%	
Levenbach and England, 1991*	Mean number of six recommended precautions taken by respondents: 2.7. (This paper reported only the mean, not frequency distributions.)		
Major, 1991	Collected data on preparedness in November and February surveys, but frequency distributions not reported in this paper.		
Snowalter, 1991	Attended earthquake meetings	28%	
	Prepared earthquake survival kit	50%	
	Made physical changes to home to reduce damage	20%	
	Did nothing and planned to do nothing	16%	

Wetzel et al., 1991

From pre-December 3 survey:

"There are a number of things people can do to reduce their risk in a quake."

Strongly agree	24%
Agree	41%
Slightly agree	21%
Slightly disagree	4%
Disagree	5%
Strongly disagree	4%

Stockpiling food, preparing the home, buying insurance, or making first aid kits for the predicted quake is

Extremely smart, serving a good purpose	24%
Very smart	31%
Somewhat smart	31%
Neutral, neither	11%
Somewhat dumb	2%
Very dumb	1%
Extremely dumb, a waste of time/$	1%

From survey 1-3 days after predicted quake date:

Bought/made first aid kit	16%
Read safety pamphlet	44%
Stockpiled supplies (water, food)	31%
Made escape routes from buildings	19%
Prepared home, made modifications	11%

References

Alexander, Karl, Doris R. Entwisle, and Maxine S. Thompson. 1987. "School Performance, Status Relations, and the Structure of Sentiment: Bringing the Teacher Back In." American Sociological Review 52: 665-682.

Allport, Gordon W., and Leo Postman. 1947. The Psychology of Rumor. New York: Holt.

Atwood, Douglas, Lawrence Clark, and Louis Veneziano. 1991. "The Effect of Various Media on Responses to the New Madrid Earthquake Prediction as Moderated by Sociodemographic and Personality Characteristics." Paper presented at Research Conference on Public and Media Response to Earthquake Forecasts, May 16-18, 1991, Southern Illinois University at Edwardsville, Edwardsville, Illinois.

Atwood, L. Erwin. 1991. "The Great Media Earthquake of 1990: Third Person Effects." Paper presented at Research Conference on Public and Media Response to Earthquake Forecasts, May 16-18, 1991, Southern Illinois University at Edwardsville, Edwardsville, Illinois.

Baker, Earl J. 1979. "Predicting Response to Hurricane Warnings: A Reanalysis of Data from Four Studies." Mass Emergencies 4: 9-24.

Baldwin, Tamara. 1991. "Earthquake Awareness in Southeast Missouri: A Study in Pluralistic Ignorance." Paper presented at Research Conference on Public and Media Response to Earthquake Forecasts, May 16-18, 1991, Southern Illinois University at Edwardsville, Edwardsville, Illinois.

Ball-Rokeach, Sandra. 1973. "From Pervasive Ambiguity to Definition of the New Situation." Sociometry 36: 378-389.

Beer, Francis A. 1981. Peace Against War: The Ecology of International Violence. San Francisco: W. H. Freeman.

Cantril, Hadley. 1965. Invasion from Mars. New York: Harper and Row.

Couch, Carl J. 1970. "Dimensions of Association in Collective Behavior Episodes." Sociometry 33: 457-471.

Coverman, S., and J. Sheley. 1986. "Change in Men's Housework and Child-Care Time, 1965-1975." Journal of Marriage and the Family 48: 413-422.

Dearing, James W., and Jeff Kazmierczak. 1991. "Making Iconoclasts Credible: The Iben Browning Earthquake Prediction." Paper presented at Research Conference on Public and Media Response to Earthquake Forecasts, May 16-18, 1991, Southern Illinois University at Edwardsville, Edwardsville, Illinois.

Edwards, Margie L. 1991. "Public Response to the Browning Forecast: Implications for Household Preparation in Memphis." Paper presented at Research Conference on Public and Media Response to Earthquake Forecasts, May 16-18, 1991, Southern Illinois University at Edwardsville, Edwardsville, Illinois.

Farley, John E., Hugh D. Barlow, Lewis G. Bender, Marvin S. Finkelstein, and Larry Riley. 1991a. "Earthquake Hysteria: Public Response to a Psuedoscientific Forecast of Disaster." Paper presented at annual meetings of the Midwest Sociological Society, Des Moines, April 11.

Farley, John E., Hugh D. Barlow, Marvin Finkelstein, Larry Riley, and Lewis G. Bender. 1991. "Earthquake Hysteria, Before and After: A Survey and Follow-up on Public Response to the Browning Forecast." Paper presented at Research Conference on Public and Media Response to Earthquake Forecasts, May 16-18, 1991, Southern Illinois University at Edwardsville, Edwardsville, Illinois.

Gasparich, Joseph V. 1991. "A State Agency's Reaction to Public Concern Caused by the December Earthquake Prediction and A Short History of the Illinois Emergency Services and Disaster Agency's Earthquake Awareness and Preparedness Program." Paper presented at Research Conference on Public and Media Response to Earthquake Forecasts, May 16-18, 1991, Southern Illinois University at Edwardsville, Edwardsville, Illinois.

Hochschild, Arlie. 1989. The Second Shift: Working Parents and the Revolution at Home. New York: Viking Penguin.

Kennedy, John M. 1991. "Hoosier Reactions to the Predictions of an Earthquake." Paper presented at Research Conference on Public and Media Response to Earthquake Forecasts, May 16-18, 1991, Southern Illinois University at Edwardsville, Edwardsville, Illinois.

Kerckhoff, Alan C., Kurt W. Back, and Norman Miller. 1965. "Sociometric Patterns in Hysterical Contagion." Sociometry 28: 2-15.

Kohn, Melvin L. 1969. Class and Conformity. Homewood, IL: Dorsey.

La Piere, R. T. 1934. "Attitudes Versus Actions." Social Forces 13: 230-237.

Lazarus, R. S. 1966. Psychological Stress and the Coping Process. New York: McGraw-Hill.

Levenbach, F. David, and David E. England. 1991. "Citizen Preparedness for the December, 1990 Earthquake." Paper presented at Annual Meeting of the Southwest Political Science Association, San Antonio, TX, March 27-30.

Major, Ann M. 1991. "The 'Situational' Nature of Situational Communication Theory: Opinion Responses Before and After the Browning Earthquake Prediction of 1990." Paper presented at Research Conference on Public and Media Response to Earthquake Forecasts, May 16-18, 1991, Southern Illinois University at Edwardsville, Edwardsville, Illinois.

Mazon, Mauricio. 1984. The Zoot-Suit Riots: The Psychology of Symbolic Annihilation. Austin: University of Texas Press.

Mikami, Shunji, and Ken'ichi Ikeda. 1985. "Human Response to Disasters." International Journal of Mass Emergencies and Disasters 1: 107-132.

Mileti, Dennis S., Colleen Fitzpatrick, and Barbara C. Farhar. 1990. Risk Communication and Public Response to the Parkfield Earthquake Prediction Experiment. Final Report to the National Science Foundation. Fort Collins: Hazards Assessment Laboratory and Department of Sociology, Colorado State University.

Miller, David L., Kenneth J. Mietus, and Richard A. Mathers. 1978. "A Critical Examination of the Social Contagion Image of Collective Behavior: The Case of the Enfield Monster." Sociological Quarterly 19: 129-140.

Rose, Jerry D. 1982. Outbreaks: The Sociology of Collective Behavior. New York: Free Press.

Rosengren, Karl E., Peter Arvidson, and Dahn Sturesson. 1975. "The Barseback 'Panic': A Radio Programme as a Negative Summary Event." Acta Sociologica 57: 309-314.

Safran, Claire. 1988. "Hidden Lessons: Do Little Boys Get a Better Education than Little Girls?" Pp. 35-37 in Paula S. Rothenberg (ed.), Racism and Sexism: An Integrated Study. New York: St. Martin's Press.

Shibutani, Tamotsu. 1966. Improvised News. Indianapolis: Bobbs-Merrill.

Shipman, John M., Gilbert L. Fowler, and Russell E. Shain. "Iben Browning and the Fault: Newspaper Coverage of an Earthquake Prediction." Paper presented at Research Conference on Public and Media Response to Earthquake Forecasts, May 16-18, 1991, Southern Illinois University at Edwardsville, Edwardsville, Illinois.

Showalter, Pamela Sands. 1991. "Small Community Response to the New Madrid Earthquake Projection: Preliminary Survey Results." Paper presented at Research Conference on Public and Media Response to Earthquake Forecasts, May 16-18, 1991, Southern Illinois University at Edwardsville, Edwardsville, Illinois.

Stacy, J., S. Bereaud, and J. Daniels. 1974. Sexism in American Education. New York: Dell.

Stevens, Jill D. 1991. "An Association of Circumstance: The Browning Prediction and the Center for Earthquake Research and Information." Paper presented at Research Conference on Public and Media Response to Earthquake Forecasts, May 16-18, 1991, Southern Illinois University at Edwardsville, Edwardsville, Illinois.

Sylvester, Judith. 1991. "Media Research Bureau/Suburban Journals Earthquake Prediction Poll." Paper presented at Research Conference on Public and Media Response to Earthquake Forecasts, May 16-18, 1991, Southern Illinois University at Edwardsville, Edwardsville, Illinois.

Turner, Ralph H., and Lewis M. Killian. 1987. Collective Behavior, third edition. Englewood Cliffs, NJ: Prentice Hall.

Turner, Ralph H., Joanne M. Nigg, and Denise Heller Paz. 1986. Waiting for Disaster: Earthquake Watch in California. Berkeley: University of California Press.

Wetzel, Christopher G., Ed Hettinger, Robert McMillan, Raymond Monroe, and Andy Nix. 1991. "When a Quack Predicts a Quake: College Student Reactions to a Disconfirmed Prediction." Paper presented at Research Conference on Public and Media Response to Earthquake Forecasts, May 16-18, 1991, Southern Illinois University at Edwardsville, Edwardsville, Illinois.