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MAKING SENSE OF COLLECTIVE
PREOCCUPATIONS: LESSONS FROM
RESEARCH ON THE IBEN BROWNING
EARTHQUAKE PREDICTION*

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Introduction

Monsters abroad in the community. Visitations by flying saucers. Public hatred targeted at newly discovered villains in society. A disease of mysterious origin that strikes its victims down without warning. Doomsday warnings and reports of a coming millennium. A rush to jump on an investment bandwagon and obtain undreamed-of wealth. Sightings of the Blessed Virgin and Christ. Scattered throughout the collective behavior literature are articles describing widespread involvement in these kinds of emergent beliefs and behaviors. Common to most such episodes, which I call "collective preoccupations," is the collective discovery of some previously unknown or nonsalient object of attention that begins to assume new significance in light of emerging definitions, that constitutes a focus for interaction within a collectivity, and that causes at least some participants to reorganize their daily activities.

The beliefs and behaviors that constitute a collective preoccupation may be simple or highly elaborate. They may be ephemeral and short-lived, extending only over a few weeks or months; or they may be quite long-lasting. They may be relatively inconsequential in their impact on the established social order, as is the case with many of the collective preoccupations sociologists label "fads" and "crazes"; or their effects may be quite profound. Regardless of their differences, however, all collective preoccupations have three common characteristics: the emergence of definitions of the situation that are novel and noninstitutionalized--at least from the perspective of the social settings in which they develop; heightened interest by members of the collectivity in the object of attention, coupled with intensified interaction aimed at reducing ambiguity about the situation; and information transmission processes that rely as much on informal and extra-institutional channels of communication (e.g., rumor) as on official and media channels.¹

¹ Some recent work in the field (cf Goode, 1992) seems to emphasize the bizarre nature of many "collective delusions." However, this treatment does not consider factual correctness or "outlandishness" key characteristics of collective preoccupations. For purposes of this discussion, the definitions of the situation that develop can be either correct or incorrect, bizarre or commonplace. It is the fact that the beliefs in question are emergent and the product of interaction within a collectivity that is important, not the nature of those beliefs. At the same time, the question of how and why some preoccupations generate interpretations that differ markedly from conventional beliefs is an important topic for investigation.

Classic studies of collective preoccupations include work on public preoccupation with a "phantom anesthetist" in Mattoon, Illinois (Johnson, 1945); a windshield pitting epidemic in Seattle (Medalia and Larsen, 1958); a "phantom slasher" in Taipei, Taiwan (Jacobs, 1965); an "invasion from Mars" (Cantril, 1940); witches in Scotland, the European continent, and the United States (Erikson, 1966; Currie, 1968; Ben-Yehuda, 1980); and divine visitations and miracles (e.g., Tumin and Feldman, 1955). Many writers also treat episodes of so-called hysterical illness such as the June Bug Epidemic (Kerckhoff and Back, 1968) or a "gas poisoning" on the West Bank (Hefez, 1985) as comparable phenomena, although that will not be the approach taken here. Also considered similar by many scholars are various millenarian and messianic beliefs, some of which are associated with social movements; economic crazes; and fads of various kinds.

Sociologists have used many different terms--including misleading ones--to describe these kinds of collective behavior episodes, and criteria for inclusion in the category have been inconsistent. I prefer to use the term "collective preoccupations" as a general concept encompassing the range of behaviors comprising such episodes because, unlike many other terms that have been used, it has neutral connotations.

In this paper, I will do four things: (1) discuss alternative characterizations of collective preoccupations in the literature; (2) outline changes in the ways collective behavior scholars view these episodes; (3) present data on a recent collective preoccupation, the public response to a non-scientific earthquake prediction, which occurred over a period of several months in 1990, in light of these trends; and (4) discuss the implications of this case for how sociologists ought to conceptualize and study collective preoccupations.

Characterizing and Explaining Collective Preoccupations

Collective preoccupations have not been handled well in the collective behavior literature. Until fairly recently, analyses have mischaracterized and oversimplified these phenomena, and attempts at explanation were ill-considered and incomplete. For example, some collective behavior analysts, particularly the authors of classic studies, seemingly adopting the perspective of the media and the general public, characterized collective preoccupations essentially as psychic epidemics. Increasingly, however, scholars are questioning whether there is any real substance to media descriptions of purported mass preoccupations and panics (c.f., Miller, 1985).

As terms like "phantom slasher" and "phantom anesthetist" imply, those who conducted the pioneering studies in the area also took for granted that the objects of public concern were illusory and that those who participated in preoccupations were in the grip of some sort of collective delusion. The content of emergent

beliefs was typically characterized as bizarre, silly, and outlandish; this characterization tended to carry over into discussions of participants as well. Today, most analysts would probably concur that issues of factual accuracy are not really relevant to the study of such phenomena; that is, for analytic purposes it is not particularly important whether the focus of a collective preoccupation is factually true or untrue.

There is little agreement among scholars on how emergent collective definitions ought to be conceptualized and classified, and the imagery that many writers evoke in their discussions has tended to obscure the essential features of these phenomena. Classic treatments favored terms such as "mass hysteria" and "collective delusion," and the emphasis in these early studies was on how and why people get caught up in beliefs that are so obviously bizarre and erroneous. Lang and Lang (1961: 347) treat collective preoccupations as a type of mass behavior that "occurs in the context of demoralizing tendencies," the product of a "collective incapacity" resulting from the fact that individuals in the mass, detached from stabilizing institutions such as families and friendship groups, are more subject to new influences.

Focusing on more recent writings, Turner and Killian (1987) subsume collective preoccupations under the rubric of "diffuse collectivities" or "diffuse crowds," a category that in their formulation also covers publics and social movements. The diffuse crowd classification includes "crisis crowds," a category that subsumes such phenomena as scapegoating episodes; fads and crazes; deviant epidemics such as outbreaks of swastika-painting; and mass movements. In such episodes (1987: 136):

individuals encounter expressions of the same sentiments, witness the same behavioral models, and quickly acquire the sense that they are part of a collectivity, sharing uniform sentiments and encompassing a large number of people. With this sense, they are able to act, in many respects, like members of a compact crowd, to speak with minimum reflection and without qualification, to express feelings or engage in behavior that would place them in a bad light under more typical circumstances, and to disregard many of the more routine demands of everyday living.

Turner and Killian also emphasize the important keynoting role that the mass media can play in such episodes, noting that (1987: 137) the media convey "not only a point of view but also the sense that the voice of thousands of persons is being expressed."

Some of the phenomena that Turner and Killian call "diffuse collectivities" are also considered by Smelser (1962). In his value-added theoretical formulation, what gives collective preoccupations their distinctive character are primarily the

generalized beliefs that serve as a basis for action. Panics (a category that for Smelser includes both panic flight within the crowd and financial panics) are seen as directed by hysterical generalized beliefs; crazes involve wish-fulfillment beliefs; and scapegoating episodes involve hostile generalized beliefs. Two assumptions embedded in Smelser's work--that participants' behaviors in collective behavior episodes are direct reflections of underlying psychological states and that beliefs and affect are more or less uniform among participants--would be considered untenable by most scholars working in the area today.

In his collective behavior text, Rose (1982: 24) discusses what he terms "pseudo-disasters," or "episodes in which people imagine, without firm factual basis, that emergency conditions prevail." For Rose, the concept of pseudo-disasters encompasses illusory dangers like phantom and monster sightings as well as various episodes of hysterical illness or contagion. Other types of collective preoccupations Rose classifies as "persecutions" or religious "renewals," depending on the content of the beliefs that emerge. Miller's text (1985) applies the term "mass hysteria" to collective preoccupations, but uses the term in a sense that is different from that of earlier researchers. Duggan (1990) characterizes a collective preoccupation involving appearances by the Virgin Mary in Royal Oak, Michigan as an "expressive crowd," because crowds formed on a regular basis to observe the apparitions.

As these examples show, conceptualizations of collective preoccupations vary considerably, and sociologists are not in agreement with respect to which phenomena their concepts encompass and what the essential features of these phenomena are. For example, crowd imagery is used by some scholars to describe and explain collective preoccupations, presumably on the assumption that these phenomena have a lot in common with crowds. Episodes of hysterical contagion, which involve the spread of physical symptoms in a population without any apparent physical cause, are also seen by many as comparable to collective preoccupations.

Problems with Earlier Formulations. The early literature on collective preoccupations was based on theories of collective behavior that have been largely discredited. Early writers accepted various questionable assumptions about the phenomena they were studying, which led in turn to questionable empirical studies and distorted findings. First among these incorrect assumptions was the notion that involvement in collective preoccupations must necessarily derive from some common psychological source, such as hysteria or anxiety. In the early literature, collective preoccupations were conceptualized as epidemics that spread through a population, drawing in people with the requisite psychological risk factors. Thus Medalia and Larsen (1958) describe concern about pitted windshields in Seattle as an "epidemic" or "mass delusion" that had as its basis widespread anxiety about bomb

testing. In a similar vein, Klapp (1972) argues that while the symbols that are collectively developed to characterize the object of collective focus are important determinants of the direction a contagion will take, all "contagions" have a common origin in high levels of psychic tension.²

Assumptions about psychological predispositions are probably one reason researchers decided it was appropriate to group together both collective preoccupations and episodes of so-called hysterical illness--phenomena that do not necessarily belong together. For classical writers, and even for some scholars who came later (e.g., Smelser, 1962), both forms of collective behavior were manifestations of psychological hysteria.³

The notion that psychological predispositions set the stage for participation in collective preoccupations led logically in the classic literature to the search for types of "susceptible" or "suggestible" individuals. Johnson (1945), for example, found that in the "phantom anesthetist" episode, women were more suggestible than men (a finding he relates to the greater propensity of women to suffer from hysteria); children were more suggestible than adults; and low-income individuals were more suggestible than the better-off. Medalia and Larsen's study on the windshield pitting epidemic (1958) found that low levels of education were associated with suggestibility, but in that episode, women were no more suggestible than men.

² Klapp distinguishes five types of contagion: anxious, hostile, rebellious, enthusiastic, and expressive.

³ In contrast with what I call collective preoccupations, so-called hysterical contagion episodes are accompanied by actual physiological and behavioral changes in at least some participants, which are probably contingent on direct or indirect contact with behavioral models. "Contagions" typically (although not always) involve individuals who are in face-to-face contact; they usually occur in a specific physical or social setting; and most (but not all) are relatively short-lived. The mechanisms by which symptoms are transmitted in "contagions" are likely to more closely resemble the mechanisms of interpersonal influence that occur in crowds. It thus seems appropriate to consider contagions and collective preoccupations as analytically separate categories. Further, a new critical look at so-called hysterical illness episodes (Stallings, forthcoming) argues that the term "hysteria" should be thought of as a label used by powerful groups in society to discount and dismiss symptoms experienced by members of less powerful groups, e.g., women and children. Stallings faults sociologists for being so willing to adopt media and psychiatric perspectives on these episodes and to reify the concept of mass hysteria instead of studying the labeling process itself.

Partly as a consequence of advances in interactionist formulations, particularly emergent norm theory, such explanations, which are examples of what Turner and Killian (1987) term "convergence" approaches, are now looked on with skepticism in the collective behavior field. Instead, in analyzing these phenomena, the explanatory focus has shifted from identifying characteristics that predispose people to participate in such events to the study of patterns of interaction and information exchange within collectivities.

A related assumption in the classical literature on collective preoccupations was that participants were similar in their emotional and behavioral orientations, either because of predisposing factors or as a consequence of participation in the collective preoccupation. The idea that once drawn into an episode, participants come to think and feel identically has its roots in the imagery of LeBonian contagion theory (1895) and in Blumer's (1939) concept of social contagion, which he argued resulted in lowered self-consciousness and a corresponding willingness to adopt novel patterns of behavior. Like convergence explanations, contagion approaches have been refuted in the literature and replaced by more empirically sound formulations.

Newer Approaches. Recent treatments of collective preoccupations paint a picture that is considerably more complex. Three themes in the literature warrant mention here: the role of the media in shaping public perceptions and disseminating erroneous information about preoccupations; organizational mobilization and its impact on the shape these episodes take; and differential participation by the public in collective preoccupations.

First, with respect to **media accounts**, current analyses are more critical about mass media descriptions of collective preoccupations, particularly when the episodes in question involve so-called mass hysteria or panic. For example, while the "Invasion from Mars" episode is still widely considered the prototypical mass panic outbreak, collective behavior scholars are now quick to point out that those who reacted to the broadcast with fear constituted only a tiny proportion of the population (Cantril, 1940). Similarly, in a study of what had been described in media accounts as an epidemic of monster sightings in Illinois, Miller, Mietus, and Mathers (1978) found that almost none of the individuals involved in the so-called mass panic actually believed the monster reports were credible. Participation in the event mainly consisted of engaging in discussions about the reported monster sightings and a limited amount of mobilization behavior, which generally occurred when people had free time to attend gatherings. Rosengren, Arvidson, and Stureson (1975) looked into an episode in Sweden that was characterized in the media as a collective panic episode, resembling the response to the "War of the Worlds" broadcast. That "panic" ostensibly followed a radio show about a nuclear accident. The researchers found that contrary to media reports, only about 1%

of those in the broadcast area actually reacted fearfully to the radio show. Most people in the area either weren't listening to the broadcast, knew at the time the program was fictitious, or were curious about the broadcast and consequently engaged in a search for additional information. For the researchers who studied the "panic," the interesting research topic ultimately became the question of why the media are so quick to resort to mass panic explanations when covering the public's behavior in such events.

Second, recent scholarship also suggests that more attention should be paid to **the role of organizational actors** in the genesis and maintenance of collective preoccupations. Without the involvement of organizations and groups interested in their promulgation, collective preoccupations are less likely to become the object of widespread public attention and to be sustained over time. Empirical studies of witch hunts illustrate the important role played by institutional actors. Ben-Yehuda's analysis of the European witch craze (1980), for example, highlights the fact that the persecution of witches was not only (or even primarily) a preoccupation engaged in by large numbers of ordinary people; it was also an instrument of policy for both the Catholic Church and Protestant churches, which were desperate to retain their hold on souls in an increasingly secular world. In a related vein, Currie (1968) points out that in Europe the persecution of witches ultimately became an industry, in that the Inquisition could confiscate the property of witches and use the proceeds to fund further activity. The Inquisition also possessed other extraordinary legal powers, such as the ability to use torture to obtain confessions. Witch hunting thus became a self-sustaining enterprise, and largely for this reasons, the European witch craze lasted longer and was more vicious than its counterpart in England.

Oplinger's work (1990) corroborates this perspective on the European witch craze and also shows that contemporary witch hunts in the U. S. gained in strength when they received support from powerful organizations and institutions. The Red Scare that swept the country after World War I was strongly supported by government agencies, groups like the American Protective League, business interests, and the press. In the case of the anti-communist crusade of the early 1950's, considerable organizational support came from the Republican Party (acting through Senator Joseph McCarthy's committee), various right-wing organizations, as well as more mainstream organizations such as the American Legion, the Veterans of Foreign Wars, the Catholic Church, and the U. S. Chamber of Commerce. Conversely, support for McCarthy began to fall when the Army started to oppose him.

A recent volume edited by Richardson, Best, and Bromley (1991) focuses on an ongoing collective preoccupation: the belief in the spread of Satanism and Satanic ritual sexual abuse of children. Organized interests that have played a role in the social construction of the Satanism scare include opponents of day care,

groups arguing that children should be believed when they make sexual abuse accusations, new "child saving" movements, government-sponsored agencies like Attorney General Meese's Commission on Pornography, psychotherapists, groups that focus on rehabilitating "cult survivors," fundamentalist Christians, and the media.

In contemporary society, the mass media obviously play a key role in the formation and maintenance of collective preoccupations. It is no doubt the case that some novel sets of beliefs are developed and sustained primarily through informal communication channels such as the rumor process. However, widespread participation in collective preoccupations is much more likely if information on the topic is also disseminated through established media channels.

Because they are so pervasive, it is almost impossible to exaggerate the importance of the mass media in collective preoccupations. Depending on the societal context and their own organizational attributes and interests, media organizations may exert more or less influence on the information dissemination process, but no analysis should ignore their role in the dynamics of collective preoccupations. Media reports today reach an increasingly large and diverse audience, and media coverage alone may tend to enhance the credibility of reports concerning collective preoccupations. Since media organizations invariably report selectively and produce their own distinctive interpretations of events, they also play an important role in shaping the content of the emerging collective definition.

Perhaps most importantly, the media both stimulate and reflect interpersonal communication concerning the topic that is the object of the collective preoccupation. Turner, Nigg, and Paz (1986) and Turner (1992) describe how this process occurs, using rumors about earthquake predictions as an example. Initially, people get information on earthquake warnings from the media, and at first they may not discuss the information with others. In the second phase, people begin to clarify and refine what they hear and read in the media through discussions with members of their social networks, and then try to draw conclusions about the ambiguous information they may have received. At the next stage, as the preoccupation begins to intensify, people begin to pursue information more intensely by contacting local authorities and experts. When they get that information, they pass it on through their own interpersonal contact networks. In the fourth stage, when the demand for information reaches a peak and the need for action seems compelling, people often begin to pass on any information they have, even if it is questionable or invented.

Another dimension of this complex transmission process is that, as the topic of a collective preoccupation gets passed through informal rumor networks, the rumors themselves often become a topic for media reporting, and these stories may in turn draw in

a wider audience. Media accounts of rumors and other behavior associated with the collective preoccupation fuel further information-seeking behavior and generally lend a degree of credibility to the content of the preoccupation.

A third trend in the literature is an increasing emphasis on **differential participation** in collective preoccupation episodes. One of the key contributions of Turner's emergent norm theory is the notion that all collective behavior episodes are characterized not by homogeneity among participants but rather by heterogeneity and differential participation. Turner and Killian make a point of arguing, for example, that not everyone involved in a crowd is engaged in the same activity, at the same level of intensity, for the same reasons. Similarly, rumors are characterized not by simple transmission patterns but rather by "different actors advancing different suggestions as to what is going on and what should be done" (Turner and Killian, 1987: 59); and parallel observations are made about all the other major forms of collective behavior.

Unlike earlier work that emphasized the bizarre nature of some collective preoccupations and that questioned why people would participate in such outlandish activities, Turner's work has emphasized the continuity between involvement in collective preoccupations and everyday patterns of behavior. For example, rumor is a common feature in many collective preoccupations. Like Shibutani (1966), Turner (1992) characterizes rumor as part of the process of collective problem-solving that occurs in all social life and as related to other common information-seeking strategies people use. Differential involvement in rumor and information-seeking networks is thus one of several forms of differential participation that characterizes these episodes.

In one of the more thoughtful treatments in the literature, Miller, Mietus, and Mathers (1978), discussing the "Enfield Monster" episode, argue that explanations emphasizing contagion and homogeneity of affect in collective preoccupations characterize such episodes in ways that are distorted and inaccurate. In their view, these episodes have the following key dimensions: (1) reports of unusual and unverified sensory phenomena (e.g., a "monster,"); (2) processes of mobilization, such as the formation of groups to discuss and deal with the issues raised; and (3) preoccupation with the event or events in question, which can range from mild interest to complete disruption of everyday routines and from total belief to total skepticism. These authors argue that while the classic literature treats unusual sensory experiences, mobilization, and preoccupation as equivalent to one another, involvement by members of a collectivity can vary along each dimension. In other words, some people may report an unusual sensory phenomenon and do little else; some may mobilize for various reasons without having had the unusual sensory experience; some may believe the reports they hear about the phenomenon, while others may discount the reports

completely; some may only be involved in discussing the reports; and so on. In short, people show differential patterns of involvement with the emergent belief system. They may also be involved in different ways at different stages in the episode.

Miller further elaborates these ideas and presents what he terms a social behavioral/interactionist approach in his collective behavior text (1985). This framework is basically a synthesis of the work of McPhail and his collaborators, which concerns how people are mobilized to participate in assemblages and gatherings (c.f., McPhail and Miller, 1973; McPhail and Wohlstein, 1983), with Turner's emergent norm perspective.

Recent scholarship in the area has thus highlighted three important research considerations: the need to separate popular and media reports from actual behavior in collective preoccupation episodes; the need to understand the role established institutions and other organizational actors play in fueling, channeling, or squelching collective preoccupations; and the need to take into account differential patterns of participation in these episodes. These three themes will serve as organizing principles for an analysis of a recent collective preoccupation--the public and organizational response to the 1990 Iben Browning earthquake prediction.

The Browning Prediction as a Collective Preoccupation

Background. The Browning case is an example of a phenomenon that has become a rather common occurrence in recent years, the unofficial or pseudo-scientific earthquake prediction. Earthquake predictions are made regularly in the U. S. and worldwide by various sources, including psychics, amateur scientists, ordinary people who believe they have received extraordinary signs of coming seismic activity, and trained scientists. However, with certain notable exceptions, such as the Minturn prediction in California and the Brady-Spence prediction in Peru, most predictions don't develop into major collective preoccupations (see Turner, Nigg, and Paz, 1986 and Olson, Podesta, and Nigg, 1989 for discussions of these and other recent earthquake predictions). And no forecast associated with an earthquake (or for that matter with any other hazard in the U. S.) has ever generated the degree of concern and public involvement that was observed with the Browning prediction.

The late Iben Browning was a biophysicist by training with a Ph.D. degree in zoology. A self-taught climatologist, he ran a successful business consulting for clients interested in forecasting long-term climate trends and their impact on business activity. At a conference of equipment manufacturers in San Francisco on October 16, 1989, Browning made a statement suggesting that a major earthquake could occur around December 2 or 3, 1990, plus or minus two days, in one of several broad geographic areas,

including the Central United States. Later, Browning was also widely reported to have stated at the conference that San Francisco would soon experience a damaging earthquake--which it did, the very next day.⁴ Browning repeated what he called his "projection" for the Central U. S. region at the Missouri Governor's Conference on Agriculture in early December, 1989.

Browning's statement attracted some initial media attention, no doubt because the New Madrid Fault Zone in the Central U. S. was the site of great earthquakes in 1811 and 1812⁵ and because that part of the country is currently viewed as having the potential for generating other damaging earthquakes. The occurrence of the Loma Prieta earthquake in 1989 and the widespread media coverage that event was given probably also made Browning's projection more salient. Two newspapers in the New Madrid region, the Arkansas Democrat and the Memphis Commercial Appeal ran stories on the prediction in November 1989 that included the idea that Browning had successfully predicted the Loma Prieta earthquake and other earthquakes. The Browning prediction was reported on sporadically throughout the following winter and spring but was not covered extensively by the media.

Browning had no formal training in either seismology or geology. His method for predicting earthquakes centered on relating earth tides to seismic activity--a procedure that mainstream scientists working in the area do not consider valid. Although earth scientists have been making a concentrated effort to learn how to predict earthquakes, no reliable prediction methods have yet been developed, and no reputable scientist would issue a prediction like the one Browning was reported to have made--that is, a prediction that included a Richter magnitude and a specific time-window. However, at the time the news about the prediction

⁴ Browning did not actually refer to an earthquake in San Francisco in that presentation. Rather, he stated that "there will probably be several earthquakes around the world, Richter 6 plus, and there may be a volcano or two" (U. S. Geological Survey, 1990). The notion that Browning had successfully predicted the Loma Prieta quake was widely disseminated and added to his cachet as an earthquake forecaster.

⁵ The New Madrid Fault Zone runs in a northeastern direction, roughly between Marked Tree, Arkansas and Cairo, Illinois. Beginning on December 16, 1811 and extending through February of the following year, the area experienced several massive seismic events that are widely considered to have been the most serious earthquakes ever to occur in the U. S. The largest of these earthquakes were felt over an area covering approximately one million square miles--half of the continental U. S.. Communities in at least seven central states would be severely damaged by a major earthquake in the New Madrid Fault Zone.

first came to light, residents of the New Madrid area had little experience and knowledge of the science of earthquake prediction. Moreover, since there was a general awareness of the earthquake hazard in the area and since earthquakes were felt occasionally in the region, reports about the prediction undoubtedly stimulated some public curiosity and discussion.

In part to anticipate advances in the science of earthquake prediction, a National Earthquake Prediction Evaluation Council (NEPEC), consisting of recognized experts from various earth science disciplines, was established in the U. S. to assess predictions and indicate which ones were credible enough to be taken seriously. Members of NEPEC were aware of the Browning prediction as early as the spring of 1990, but they decided at that time not to evaluate it. NEPEC did not issue an official report declaring the prediction invalid and non-scientific until October 18 (see U. S. Geological Survey, 1990), and then it did so only because of the rising public furor. By the time the NEPEC report debunking Browning began to be disseminated, the preoccupation had already grown considerably in intensity.⁶

Newspaper Coverage of the Prediction and Its Characterization of the Public's Response. Occasional media reports about the Browning prediction appeared during the winter and spring of 1990, and a number of stories were run in local newspapers in the New Madrid region giving credence to the prediction. However, public concern did not really begin to surface until early August, 1990. On August 1, the Center for Earthquake Research and Information (CERI) at Memphis State University (Memphis is in the heart of the New Madrid area), received approximately 200 telephone calls. Many callers indicated they had heard rumors that the date of the prediction had been changed from December 3 to August 3, and they were concerned about what to do (Stevens, 1991). Although members of the staff were aware of the Browning prediction, this was CERI's first indication that an extensive rumor network had developed and that public concern was becoming widespread.

Local media in the Central U. S. began covering the story with more intensity around this time, and on August 20, the New York Times ran a story on the prediction and the concern it was generating in the region. While pointing out that seismologists currently consider it impossible to predict earthquakes, the article stated that Browning had been credited with predicting the Loma Prieta earthquake and other earthquakes, as well as the

⁶ NEPEC appears to be ill-equipped to handle earthquake predictions arising from unconventional sources. For a fascinating account of how NEPEC and other agencies in the scientific establishment dealt with another controversial earthquake prediction--the Brady-Spence prediction for Peru--see Olson, Podesta, and Nigg, 1989.

volcanic eruptions at Mount Saint Helen's. Significantly, the article also contained extensive quotes from the director of an earthquake information center at a university in the New Madrid region who said he considered Browning highly credible. In later months, this individual would become an influential champion and media spokesman for the Browning prediction and would make numerous public appearances, exhorting residents of the region to prepare for a coming earthquake.⁷

The Times story initiated a barrage of media coverage that gathered intensity as December 3 drew nearer. Local coverage in the New Madrid area was almost continuous throughout the fall season, and the major national media, including the television networks and prestigious newspapers such as the Wall Street Journal also carried major stories on the prediction and the public response.⁸ A content analysis of three major newspapers published in the New Madrid area (the St. Louis Post Dispatch, the Memphis Commercial Appeal, and the Little Rock Gazette) found that the newspapers published 343 articles on the predicted earthquake between June 1 and December 3, 1990, the vast majority of which were news stories. Approximately one-fourth of the articles identified Browning by name; the most common way the stories dealt with Browning's credibility was to take no position either way. However, as the date of the predicted earthquake drew nearer, the frequency of articles challenging his credibility increased, and four of the five editorials that appeared on Browning argued the prediction wasn't credible. (For additional descriptive material on the content of newspaper articles, see Shipman, Fowler, and Shain, 1991.)

⁷ This individual later became the object of intense press scrutiny and criticism for his role in the promulgation of this prediction and other non-scientific earthquake forecasts. Almost immediately after the early December time window passed, he was removed from his center directorship in a general atmosphere of condemnation.

⁸ It is nearly impossible to tell how many stories actually appeared in newspapers and were broadcast on radio and television during the period of the preoccupation. There are thousands of media outlets in the region affected by the prediction, and the national media regularly ran stories as well. The National Center for Earthquake Engineering Research at the State University of New York at Buffalo, which subscribes to a newspaper clipping service, collected approximately 550 stories from various papers about the prediction; this number undoubtedly represented only a small proportion of the articles that actually appeared. Radio and television coverage of the prediction and the ensuing collective preoccupation were also extensive.

Another analysis of coverage of the Browning prediction, focusing on one hundred stories published between August and December by twelve large-circulation newspapers, found that newspaper reports were generally supportive of Browning's theory. That is, their style and tone was such that Browning's credibility was enhanced, and the general message was that the prediction was scientifically accurate. By and large in these articles "readers were being told which way to believe, and it was the wrong way" (Dearing and Kazmierczak, 1991).

The Disaster Research Center (DRC) obtained access to 631 newspaper reports on the prediction that were taken from various national and regional sources. With respect to content, a large number of articles focused on the prediction itself, the earthquake hazard in the region, and what residents could do to prepare for earthquakes. Other articles focused on what organizations and communities in the region were doing in response to the prediction: planned earthquake emergency response drills and stepped-up training efforts; public meetings; the distribution of printed earthquake preparedness information; school closings; and cancellations of public events.

Of particular interest here are the newspaper stories that focused on how people in the region were reacting to the news of a coming earthquake. Generally speaking, when the newspapers reported on the public's response to the prediction, the impression they gave was that large numbers of people not only were aware of the prediction but believed it and were acting on the basis of that belief. The public was also described as becoming increasingly fearful as December 3 drew near. The August 20 New York Times story that served as a national keynote for the preoccupation started out rather mildly, stating that "[m]ost on the fault aren't panicking, but they're taking precautions." While downplaying fear as a reaction to the prediction, the story did suggest people had begun to prepare for the coming earthquake. Later newspaper stories tended to emphasize the "panic" theme. For example, a September 23 article in the St. Louis Post-Dispatch claimed that "public reaction is approaching panic." An October 31 headline in New York Newsday described Central U. S. residents as "quaking in their boots." A November 24 story in the Memphis Commercial Appeal stated that "there is panic in the autumn air here in the Mid-South," and "thousands of people are planning family vacations for the first week in December" to avoid the earthquake. "Hysteria," and "mania" were other terms that appeared frequently in connection with the public response. Although the controversy over the validity of the proposal was discussed in various articles, the overall message conveyed in these reports was that the prediction was being taken very seriously by residents of the region. In other words, concern was equated with belief in the prediction and with mass mobilization in response to it.

The Organizational Response. As December 3 grew nearer, public concern increased in tandem with the stepped-up media coverage. The increase in public curiosity about the prediction created a situation in which organizations with responsibilities in the earthquake area and emergency relevant agencies in general felt increased pressure to respond. Other organizations got drawn into the preoccupation because of the business opportunities it provided. Media characterizations of these organizational activities served in turn to further reinforce public awareness of and involvement with the prediction.

At Memphis State, CERI reported receiving 150-200 inquiry calls per day in the period between early August and the end of November. During the month of November alone, in addition to fielding calls from the public, CERI staff also made 45 presentations in response to requests by community groups and gave thirty interviews to the media (Stevens, 1991). Disaster-related agencies such as the Federal Emergency Management Agency (FEMA), state offices of emergency management in the affected region, and the Red Cross were inundated with requests from community residents and concerned organizations for information on the earthquake prediction and on recommended preparedness measures.⁹ Public safety and emergency preparedness agencies were heavily involved in distributing brochures and other printed materials, giving interviews, and making public presentations in the months leading up to the December 3 prediction date.

In dealing with the public and the media, representatives of these emergency organizations took a variety of positions. Some officials (including several high-ranking emergency management officials in the region) stated publicly that they believed the prediction and that local governments, households, and businesses should begin preparing for an earthquake. Others who were more knowledgeable about the science of earthquake prediction did not consider the prediction valid, but many in this group nevertheless believed that it provided an opportunity to educate people about the earthquake hazard; they did not want to totally dismiss the

⁹ For example, a story in the St. Louis Post-Dispatch that ran on September 20 reported that county emergency preparedness officials were receiving hundreds of inquiries from the public each day regarding earthquake preparedness, as well as numerous requests for public presentations. The public's demand for printed materials on earthquake safety was placing a strain the county's printing and mail budget, according to an official quoted in the article. Another official was quoted as saying "We don't take a position that an earthquake will or will not happen...We're here to educate people about how to prepare, because scientists say one will eventually happen, whether it's Dec. 3 or nine years from now."

prediction and give up that opportunity. Thus, the stance many organizational officials adopted was to say, "Well, probably the prediction won't prove accurate, but there is definitely an earthquake problem in this area, and people should take steps to prepare anyway."¹⁰ One conclusion members of the public could have drawn from such statements was that government officials actually considered the prediction valid but weren't telling.

In response to the increased level of public interest, state and local government officials began making preparations of various kinds to deal with the impending earthquake threat, and as noted above, these preparations were then reported on by the press. A number of states and local jurisdictions planned earthquake disaster exercises during autumn of 1990 to improve preparedness. Plans for closings of elementary and secondary schools were also widely reported. Of the 57 large school districts within the New Madrid Fault Zone that were subsequently contacted for this research, 33 reported that their schools had indeed been closed on December 3.

Experts on the earthquake hazard considered the Browning prediction invalid. Scientists are not able to predict earthquakes with accuracy and are quite far away from being able to assign specific dates and magnitudes to predictions. However, with the exception of staff members at CERI who were compelled to become involved and a few other scientists who eventually spoke out, earthquake researchers generally tried to steer clear of the controversy. Some believed that commenting on the prediction, even to contradict it, would only give Browning more credibility. NEPEC, which could have issued a statement evaluating the prediction at any point, did not do so until after the preoccupation had developed.¹¹ However, as noted earlier, the

¹⁰ An example of this approach is shown in an article that ran in the Little Rock Gazette on September 13, 1990, entitled "Drill, 'Quake Prediction Coincide." The article begins, "There may not be anything to the prediction that there will be an earthquake in Northeast Arkansas in early December, but the state Office of Emergency Services is getting ready--just in case." The article goes on to quote an official as stating that while the prediction may not prove correct, emergency response organizations planned to go into a state of readiness from December 1 to 6, so "if the real thing were to occur, we would be assembled." Numerous news reports like this one appeared throughout the region in the fall of 1990.

¹¹ A U. S. Geological Survey report on the Browning affair states that (1993: 9) "NEPEC's original response was not to evaluate the prediction, deeming it scientifically insignificant. This is the same way NEPEC has treated most of the 300 earthquake predictions submitted to it since 1977." NEPEC was evidently not willing to factor social significance into its decision-making

prediction had one very active organizational champion in the New Madrid region--a university-based geologist who was extremely willing to speak with the media, appear at public meetings, and otherwise "promote" the prediction. Speculations abound regarding this individual's reasons for becoming so involved in the Browning episode, which could have included a desire to alert residents of the region and help them prepare, career considerations, or the wish to enhance the reputation of his center and university in the earth sciences area. Since other organizations representing the earthquake research community were initially far less involved in the public discourse regarding the prediction, this individual's statements, which were disseminated extensively, had considerable weight.

Other organizations that either promulgated or reacted to the prediction included insurance companies, the national entertainment media, and businesses that could profit by linking their products to the preoccupation. Sales of earthquake insurance increased dramatically in the Central U. S. because of concern with the prediction. In Missouri alone, for example, homeowners paid out an estimated \$22 million to add earthquake coverage to their existing policies. The demand for insurance coverage was high throughout the region and even in distant states like Michigan (U. S. Geological Survey, 1993). Insurance companies undoubtedly considered the prediction a windfall, since earthquake policies in low-risk areas like the New Madrid region are highly profitable.

As the collective preoccupation grew--and no doubt to capitalize on the increased public interest--NBC ran a two-part, made-for-TV movie on November 11 and 12 entitled "The Big One: The Great Los Angeles Earthquake." The story focused on a female seismologist who had made an earthquake prediction for Los Angeles that wasn't taken seriously and on the death and destruction that followed. The movie ran nationally with a trailer featuring information on the New Madrid prediction and what to do to prepare for earthquakes.

Businesses offering any product or service that could conceivably be related to earthquake safety also rushed to take advantage of the growing public interest in the December 3 prediction. As the Kansas City Star noted in an October 14 story entitled "Businesses Thriving on Earthquake Fears," all sorts of earthquake safety items were marketed, including home survival kits, natural gas shut-off devices that are activated by earthquake shaking, bottled water, canned goods by the case, and even the video of Browning's prediction speech. In a November 13 story entitled "On Quake Fear, Business Bonanza in the Midwest," the New York Times described the preoccupation as a boon to suppliers of earthquake safety kits, earthquake safety consultant firms,

until pressed to do so.

marketers of Velcro fasteners (used to anchor computers and other equipment to keep them from falling during earthquake shaking), and other businesses. Stores in the New Madrid area created large displays featuring things they said would be needed in the event of a major earthquake, such as bottled water, canned goods, and blankets, and people were encouraged to stockpile these items. Merchants selling all sorts of merchandise, such as cellular telephones, outdoor cooking grills, and 4-wheel drive vehicles began running advertisements linking those products to earthquake survival. At a time when the economy was beginning to weaken, the prospect of a growing market for preparedness and survival-oriented products must have seemed tantalizing indeed to New Madrid merchants.

The Public Response: Information-Seeking and Differential Involvement. During the fall of 1990, it became evident that concern with the Browning prediction, both in the general public and among a range of agencies and organizations, was continuing to build and that as the December 3 deadline approached interest would likely increase further.¹² Researchers from various disciplines began conducting studies in different communities in the New Madrid area to obtain information on the public response to the prediction. These studies shed considerable light on the degree to which residents of the area were aware of and concerned with the prediction and how they reacted to it.

In mid-October, 1990, researchers at Southern Illinois University in Edwardsville conducted telephone interviews with random samples of residents in the St. Louis metropolitan area and in Cape Girardeau, Missouri and the nearby community of Sikeston. They found that awareness of the prediction was practically universal in all three communities; nearly 94% of the respondents in the St. Louis area and 97% of the residents in the other two Missouri communities knew about the prediction. Opinions about the likelihood of an earthquake on or around December 3 also suggested a rather high degree of belief in the prediction; just over half of the respondents considered an earthquake somewhat likely or very likely for that time. Additionally, one-quarter of the St. Louis respondents and one-half of the residents in the other two communities said they were planning to change their schedules around the time of the predicted earthquake, and a slightly smaller but still significant proportion of people reported engaging in other earthquake preparedness activities. (See Farley, et al. for more extensive discussions of these survey findings.)

¹² Browning was reported to have stated that the December 3 earthquake would be preceded by other smaller quakes. Public concern undoubtedly intensified following a Richter magnitude 4.6 earthquake that occurred near Cape Girardeau, Missouri on September 26 and that was felt over a wide area.

Another study, a mail survey conducted in November, 1990 that focused on residents of small communities in Arkansas and Missouri, also found high levels of public awareness of the prediction, moderate levels of belief, and moderate reported involvement in various preparedness activities such as assembling earthquake safety kits. For example, of those responding to the survey, 28% reported attending public meetings to obtain more information about the earthquake hazard, and 20% reported making physical changes to their homes to reduce potential earthquake damage; however, 16% indicated that they hadn't done anything to plan for a coming earthquake, and they didn't intend to do so (Showalter, 1991).

DRC conducted a mail survey with a random sample of households in Memphis, Tennessee during the fall of 1990. The survey found that awareness of the prediction was virtually universal. It also found belief in the prediction to be fairly high; 44% of the respondents thought there would be a damaging earthquake in Memphis within the next three months (i.e., roughly within the time window covered by the prediction). Survey responses also indicated that residents had been extensively involved in seeking and sharing information about earthquakes. For example, eighty-nine percent of the respondents reported having talked about earthquakes with someone during the last year, with a substantial proportion of indicating they had talked about earthquakes with multiple discussion partners. Respondents reported using many different sources in gathering information about how to prepare for earthquakes; in descending order of frequency, the most commonly used were television news (89%), newspaper articles (78%), radio programs (49%), friends (42%), non-news television programs (42%) and family members (39%). Also cited frequently were co-workers, magazine articles and advertisements, utility companies, and Memphis State University (Edwards, 1991).

Awareness and concern didn't invariably translate into action that would increase household earthquake safety, however. Asked about a range of things that people might do to prepare for earthquakes, most of the Memphis respondents only took about half of the recommended precautions; only about 14% had undertaken more than half of those safety measures; and 9% had done nothing at all. Despite the intensified concern over the earthquake threat, over half the respondents still considered their households not well prepared for earthquakes (Edwards, 1991).

The survey data present a strong case for differential involvement in the preoccupation. Table 1 lists zero-order correlations among selected sociodemographic variables, information-seeking, and preparedness. The analysis suggests several patterns. First, belief in a coming earthquake was associated with social location: African American were less likely than whites to believe an earthquake was immanent, women were more likely to believe than men, and education was positively associated

with belief. More relevant for this discussion, however, is the finding that believing that a damaging earthquake was likely in the Memphis area was not significantly related to either information-seeking or the adoption of preparedness measures.

Second, like belief in the prediction, both information-seeking and preparedness were associated with respondents' sociodemographic characteristics. Whites were more likely to seek information on earthquake preparedness from multiple sources, as were those with higher income levels. Education was associated with information-seeking and with earthquake preparedness, as well as with belief in the likelihood of an earthquake. African-Americans were less likely to engage in preparedness actions than whites. This may be attributable to their lower belief levels or--equally likely--to their lower income levels.¹³ In short, contrary to media reports, knowing about the prediction, believing it, and acting on it were in no way equivalent. Patterns of involvement in the preoccupation varied and were shaped by social location. (For lengthier discussions of these patterns and additional findings, see Edwards, 1991).

The findings from this group of studies are consistent with the pattern of differential participation researchers have found in other collective preoccupation episodes. Knowledge of the prediction was very widespread, but it appears that at most only about half of those who heard about the prediction ultimately concluded that the near-term likelihood of an earthquake had increased. Large segments of the public engaged in efforts to learn more about the prediction, the earthquake hazard, and how to prepare for earthquakes by seeking information from a range of formal and informal sources. However, a relatively small portion of the public became actively involved in trying to reduce their losses by preparing for the earthquake or changing their daily routines. This pattern of differential involvement contrasts with media treatments of the preoccupation, which tended to characterize residents of the region as a mass of uncritical recipients of Browning's message who were busy either stockpiling goods for the upcoming quake or planning to leave town to avoid it.

Discussion. The public response to the Iben Browning earthquake prediction bears out many of the points emphasized by Turner and his collaborators about the nature of participation in collective behavior. Like their counterparts in California described by Turner, Nigg, and Paz in Waiting for Disaster (1986), residents of the Central U. S. were faced with an ambiguous set of

¹³ Turner, Nigg, and Paz (1986) found a similar relationship between socioeconomic status and earthquake preparedness in their study of Southern California. Not all preparedness actions households can take are expensive, but some are, and some can only be undertaken by those who own their own homes.

messages regarding a coming earthquake. And like their California counterparts, as the date of the predicted earthquake drew nearer, they turned to various sources in an effort to obtain accurate information and decide what to do. These sources included the mass media, informal communication networks, and organizational sources of earthquake expertise.

The Browning case also illustrates the importance of organizational actors in the promulgation and maintenance of collective preoccupations. Various organizations, including mass media outlets, emergency-relevant organizations, and businesses helped to sustain the preoccupation. For businesses, profits were the major considerations. For other organizations, the situation was more complex. For example, many emergency agencies, while not wishing to grant legitimacy to the prediction, nevertheless wanted to build on increased public awareness to increase preparedness in the region. In the end, their actions probably increased Browning's credibility. Media organizations may have wished to report objectively on the prediction and the public's response to it, but instead the tone of reporting lent credence to the prediction and mischaracterized the public response.

In California, which has more experience with earthquakes and earthquake prediction, both the mass media and the general public are much more knowledgeable about what science can and cannot do with respect to predicting earthquakes. Given the relative lack of experience with earthquake prediction in the Central U. S., as well as with the hazard itself, it is not surprising that public concern and curiosity were high and that the response by the media and many emergency-relevant organizations was inconsistent and ambiguous.

It is unlikely that the preoccupation would have reached such a high level without the participation of a very active local champion of the prediction, who built awareness and credibility for Browning through public statements and appearances. At the same time, the reluctance of the scientific community (particularly NEPEC) to challenge the prediction left the door open for others who thought they had something to gain by jumping on the Browning bandwagon.

TABLE 1. Correlations Among Social Location, Belief, Information-Seeking, and Preparedness

	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇
X ₁		-.1497**	-.1109*	.3228**	.1616**	.1709**	.1891**
X ₂			.0391	-.1925**	-.1690**	-.0600	-.1722**
X ₃				-.1272*	-.2302**	.0067	-.0353
X ₄					.0934	.2039**	.1868**
X ₅						-.0670	-.0088
X ₆							.3550**
X ₇							

* Signif. = .05

** Signif. = .01

X₁ = Education

X₂ = Race

X₃ = Gender

X₄ = Income

X₅ = Belief an Earthquake Probable in the Next Three Months

X₆ = No. Information Sources Used

X₇ = No. Preparedness Measures Undertaken

Conclusions

Earthquake predictions are made quite frequently in communities around the U. S. Prediction sources range from officially-designated agencies using scientific data to laypersons passing on information about prophecies like those of Nostradamus. Methods for developing earthquake forecasts vary, from commonly-accepted measures in the earth sciences to controversial approaches such as the observation of animal behavior and the monitoring of radio waves. Most predictions, including those issued by official sources, create little public stir. The Browning prediction, although initially made in a private meeting at an obscure venue by a non-expert (and one who, unlike many forecasters, didn't appear to want the publicity), turned into a major collective preoccupation, particularly in the Central U. S. The emergence and spread of this preoccupation can be explained in part by the fact that residents of the region were relatively unfamiliar with the state-of-the-art in earthquake prediction and were sensitized by exposure to the death and destruction caused by the 1989 Loma Prieta earthquake. Additionally, the population was subject to a barrage of conflicting media reports and also had access to a range of experts and organizational representatives, some of whom were confused about the prediction's legitimacy themselves and many of whom disseminated information that was wrong, contradictory, or ambiguous.

Involvement in the preoccupation consisted of various behaviors: learning about the prediction, either through passive listening or active information-seeking from the media, friends, relatives, earthquake experts, and other sources; discussing the prediction; and finally, in a comparatively small segment of the population, deciding to take more concrete steps related to the prediction. Behavior with respect to the prediction was essentially an extension of typical, everyday information-seeking patterns. The main difference was that the unfamiliarity and apparent urgency of the situation made that activity considerably more intense and pressing for some participants.

The Browning prediction case illustrates the complex nature of collective preoccupations. Rather than being characterized "pseudo-disasters" or episodes of "mass delusion," these phenomena should be thought of as complex social occasions involving various forms of participation by individuals, informal groups, social networks, and organizations. At the individual level, people hear reports that interest them from a range of official and unofficial sources. Some proportion of that group goes on to discuss the reports and seek additional information, again from various informal and official sources. In the process they develop attitudes and beliefs about those reports. Depending on other factors, those attitudes may or may not result in behavioral

change.¹⁴ In many cases, the most common form of action is simply to use various formal and informal channels to seek more information.

The Browning case also shows clearly that collective preoccupations involve not only individuals, but organizational and institutional actors as well. Organizations approach preoccupation episodes with their own sets of interests, and the actions they take reflect those interests. In the case of the Browning prediction, many organizations stood to gain from involvement in the preoccupation--at least in the short term. Actions taken by organizations in preoccupation episodes can help raise or lower public involvement and can shape the content of the beliefs that develop.

Miller, Mietus, and Mathers (1978: 139) comment that there has been a regrettable tendency in the field to relegate the study of collective preoccupations to the "back wards of sociological investigation." However, these kinds of episodes--whether focused on predictions of earthquake-generated doom, Satanic ritual abuse, or apparitions of the Virgin Mary¹⁵--provide an excellent setting in which to study and better understand a number of key sociological issues related to opinion formation, the rumor process, mass media impacts, and the relationship between attitudes and behavior. They certainly deserve a lot more attention and careful analysis than they have received in the literature to date.

¹⁴ In the case of earthquake predictions and preparedness, those factors may include being able to formulate a plan of action; personalizing the content of the preoccupation so that the actions to be taken seem meaningful; having the time and the resources to take the necessary steps; and not being constrained by conflicting obligations. As this study shows, social location variables such as ethnicity, education, and income play a role in this process.

¹⁵ At the time this manuscript was being completed, a preoccupation with the Blessed Virgin was taking hold in various parts of the country, including communities in Louisiana, Arkansas, and New Jersey. These episodes, although focused on divine rather than natural phenomena, have many parallels with the Browning prediction preoccupation.

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