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A Note on:

THE SEPTEMBER 1985 EARTHQUAKES IN MEXICO CITY

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THE CHALLENGE AND A RESPONSE

At 7:18 a.m. on Thursday, September 19, 1985 something happened that ended the lives of at least 5000 residents of Mexico City and changed the lives of many millions. That event changed my life too, in ways that I am not sure that I yet understand.

I heard about the first earthquake, as did practically everyone in the United States, from the radio or television. At first it did not really sink in, partly, I guess, because the news was somewhat sketchy because communications were, or seemed to be, disrupted. By the evening of the 19th, however, I began to think that I might like to go to see what I could learn about the effects of earthquakes on housing. At that time, my idea was simply a vague one about how interesting such a trip might be.

Several years ago, while engaged in research on community development in Guatemala, I read some materials on the earthquake that took place in, I think, 1974 during the night. In that earthquake there had been a great deal of damage to dwellings. An especially serious problem had been the tile roofs on many dwellings that collapsed, injuring the occupants. I talked with individuals in Guatemala in 1979 several years after the earthquake who reported that they barely escaped their dwellings before the very heavy roofs fell in. There were studies done of the damage to dwellings and some modifications of traditional adobe house construction were suggested. In particular, abandonment of tile roofs and the addition of a few steel-reinforced concrete posts to the traditional adobe dwelling were recommended.

Friday morning, after the first earthquake, I began to think seriously about trying to go to Mexico City to observe the effects on housing. Then I heard the reports about the second, milder shock. It seemed important to get to Mexico City quickly to be able to observe the damage and to talk with people before everything was cleaned up and people once more began feeling normal. At the same time, I was concerned that the last of the aftershocks might not be completed yet.

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So, running around a little like a hen with her head cut off I began preparing a proposal to the university for a trip to Mexico City on Wednesday, September 25, 1985. On Monday morning, the 23rd, I dropped off, at various administrative offices, copies of the brief proposal and a note warning that requests for travel and funding would be coming soon. Hurriedly, I prepared the requests and had them carried from offfice to office for signatures. The approvals were all obtained by 2:00 that afternoon. The university's ability to move quickly was stunning.

PERSONAL REACTIONS

One of the dangers of a report such as this is that it could simply be a poor version of a journalistic account of what was observed. The differences between journalists and social scientists include the greater attention of the social scientist to the building and application of logical theoretical structures of concepts and their interconnections. Those theories can be used to explain empirical phenomena including human responses to natural occurrences. The theory will be discussed later in this paper, in this section I will report some personal reactions.

Even as I am writing this, I am still searching for ways to organize my thinking. How can one categorize and order these events and their impacts on people? How can one separate emotional responses to such events as earthquakes from analytical responses? I need to answer these questions because I have to make a report to the university on how Iowa State can initiate a program of research on the effects of earthquakes on housing and households, but I also want to be able to understand the situation in Mexico City in a personal way. What you have in your hands is my attempt to do the latter and to begin the former.

When my students quote newspapers and popular magazines in their term papers, I am usually critical and write notes in the margin about using scholarly reference materials. But I read something in the newspaper that may help to organize our thoughts on the events in Mexico City. In the Des Moines *Register* of Friday, September 27, 1985 Ellen Goodman's syndicated column appeared with the headline "Cigarettes, seat belts, and AIDS" She wrote about the juxtaposition of various kinds of risks and noted the selective perception of the degree of risk in objectively risky situations.

> The images are all around us. They are scenes from the risky business of everyday living.
>
> In California, a family cuts back on sugar in the decaffeinated coffee they drink at home--on the San Andreas fault. In Pennsylvania a man goes jogging--against the backdrop of a Three Mile Island reactor. In Maine, a woman rides to aerobics class on her motorbike--without a helmet (Goodman, 1985).

According to some reports over 5000 people died in the quakes in Mexico City and there are about 1000 additional people missing. Some reports have it that there are around 20,000 people who were injured. There are about 30,000 in shelters. Some (to me,

obviously false) reports indicated that there were 400,000 people who were homeless as a result of the earthquake. Even if the estimate of the number of dead, missing, and injured is doubled to around 51,000 that is an amazingly small percentage of the 18 million people living in Mexico City. Indeed, it is less than three-tenths of a percent. The deaths, even if doubled, are less than .05 percent.

Saying that in no way is intended to minimize the awfulness of the earthquakes. It does, in one sense, help one to put the situation in context, however. It is not the deaths and injuries themselves that have the greatest impact on the general population. The impact on individual families is incalculable, of course. The impact on the population in general is the horror of it, not the fact of it. Not obvious is the reason why something that affects so relatively few people can generate such horror while other things that affect so many more go practically unnoticed. Infant mortality, for example, affects many times more lives than do earthquakes, yet one seldom reads of it in the papers and even less does one hear of it through the electronic media.

It would be tempting to suggest that the media made the disaster seem greater than it was. It is very clear that the media speeded up the process of horror development. It appears to me that the media deserve much of the credit for the speedy international response to the earthquakes in the form of rescue teams, equipment, money, and other forms of assistance. It also seems to me that Mexico's need was exaggerated. It is not obvious that Mexico was unable to handle the situation with skill and dispatch. It was obvious that official Mexico was a little reluctant about accepting so much help and the implicit suggestion that Mexico could not handle this job all by itself.

I, personally, know only a little of the horror of the experience of earthquakes. In Peru in 1965, one night there was a small shock that shook my bed a little. In Guatemala in 1979, I spent several hours on the side of a mountain near a volcano that is active from time to time. We were pretesting a questionnaire from a survey about community development. The ground was more or less continuously jiggling with bigger bumpings and grindings from time to time. How can a whole community live under such circumstances? The day I was there was the day before a fiesta and the drinking had already started. How can a young mother continue to live on a mountain near a volcano and warn her child not to wander into the path of a drunken villager and not feel the incongruence?

> A friend of yours, mine, ours explains earnestly that since the recent crop of airliner crashes, he will fly only in emergencies. But he's chainsmoking cigarettes. Another friend drinks only bottled water and eats only meat untouched by steroids, but spends weekends hang-gliding (Goodman, 1985).

Goodman goes on to say that people do seem to be somewhat open to information, some people do quit smoking, some people do use seatbelts in their automobiles. But:

> This is, after all, a country that bans saccharin and builds nuclear bombs. We argue and will go on

> arguing about risk in two different languages: numbers and emotions, odds and anxieties (Goodman, 1985).

To help explain human reactions to earthquakes I have to explain something about my own sometimes objectively incongruous reactions to risk. I quit smoking when the British report about smoking and lung cancer came out in the early 1960s. I quit drinking coffee and tea when I became convinced of the dangers of caffeine. I have a terrible flying phobia. I deal with it with legal drugs and alcohol (although with much less alcohol than before because I . . . you get the idea).

Earl Morris must be a very cautious person you say? But why does he have an intense interest in a hobby that is dangerous and has caused injuries requiring emergency room treatment? And why does he risk addiction to the drugs he takes in order to be able to fly to Mexico City where he may be exposed to earthquakes? And what about the side effects of those drugs?

Goodman (1985) says that one of the explanations is that people are fearful of situations and events they cannot control (such as earthquakes) and not as fearful of events and situations they can control (such as lung cancer from smoking or injuries from a dangerous hobby).

Every night while I was in Mexico City, the light suspended from the ceiling in my hotel room periodically began to swing gently indicating that Mexico City, or at least my hotel, was still shaking from time to time. Once the hotel let out an awful crack; it sounded like God cracking a knuckle. Those occurrences were very hard to ignore.

I wonder how many people will move out of Mexico City because of the danger of earthquakes. I wonder how many people will move out of high-rise apartments into lower residences. I wonder how many people know that rents are higher in buildings built in Mexico City to stringent earthquake standards than they are in equally safe housing in cities with less risk of earthquakes.

THE EFFECTS ON HOUSING

The purpose of the trip was:

> To . . . gather information on the consequences of the earth quake for families and their housing.

By way of rationale the proposal stated:

> Because of the recent earthquake in the Mexico City area, many chronic housing problems immediately reached a very acute stage. At such times, analysis of housing can more quickly produce research results that can have immediate policy implications. The consequences of slipshod and makeshift materials and methods in housing are magnified. Weak links in the housing system of a city and of its families can be

> detected in extreme relief. Therefore, the consequences of the recent earthquake in Mexico offer an excellent opportunity for important research insights.

As we used to say when I was in college, "Boy, is my face red." That paragraph in the proposal is just fine except for the first sentence. These earthquakes had relatively little effect on housing, especially the kind of "slipshod and makeshift" housing I was thinking of. I thought I was going to see squatter settlements that were damaged, but perhaps damaged less than was middle-class housing. I was hypothesizing that "makeshift" in terms of a single-family homemade housing is safer in an earthquake than are standard concrete or brick dwellings because the amount and density of the material in the building is less. The trouble with hypotheses is that you have to have data with variation in them to make a legitimate test.

During my stay in Mexico City I toured many, many parts of the city. I found no extensive damage to low-rise housing and none to single-family housing. Now, of course, I did not exhaustively inspect any dwellings and I saw only a small portion of the housing of Mexico City. The only noticeable damage was to medium- and high-rise buildings near or in the central part of the city. Most of them were not residential buildings.

The damage to housing that I observed was in 10-to-20 story public housing. In particular, a well-known project made up of a group of high-rise buildings was damaged with one of the buildings completely collapsed. Some of the buildings were damaged and had to be evacuated. Many of the residents were staying in a tent city in the *Plaza de Tres Culturas* (the Plaza of Three Cultures). The plaza celebrates the indigenous cultures, the Spanish culture, and the present day mestizo culture. Ironically, it is the latter that may bear responsibility for the extent of the disaster.

The stunned survivors of the damage to that housing project include at least three groupings (1) people living in the mildly damaged buildings who are back in their apartments (2) the people who lived in the evacuated buildings who are waiting for repairs to be done so they can move back in. Most of them had not yet been permitted to return to their apartments even to get their belongings and (3) people who previously had lived in the totally destroyed buildings, some of whom had lost family members.

The residents of this project are not the very poor because, even though the rent is subsidized, rent still has to be paid. Very poor people cannot bear the burden of having to come up with money every week or month because of the precariousness of their economic situations.

THE THEORY

Under ordinary circumstances the responses of families to ordinary changes in their housing or changes in their housing needs can be explained with a social systems model of household behavior (Morris and Winter, 1985). A household that experiences a mismatch

between its housing and its housing needs becomes dissatisfied if the mismatch is salient, develops a propensity to correct the mismatch and, if the constraining factors permit, corrects the mismatch by moving to a different dwelling or making changes in the current one.

Even when constraining factors prevent adjustment behavior from occurring, the theory still is robust enough to account for adaptive responses to the mismatch situation. The household may change its needs by convincing itself that more modest housing is suitable after all. Or the household may reorganize itself to be better able to adjust.

Adjustment behavior involves actions to alter elements of the environment of the social system. Adaptation involves changes in the system itself, primarily changes in norms, organization, or composition.

But what about extraordinary circumstances? Can the theory deal with situations in which routine adjustment will not suffice and the degree of adaptation required is too demanding? What does a household do when the old housing norms cannot be applied? What can be done when a household cannot decide whether there is a mismatch because the old norms have been lost?

To deal with at least one kind of extraordinary circumstance Davis (1963) outlines what he calls the "theory of change and response." The response to some kinds of change is a multiphasic one. By multiphasic, Davis means that the old norms that prescribe the appropriate means for meeting life conditions are loosened. Unusual means are permitted to be used to achieve the prescribed life conditions.

Davis' theory appears to apply to chronic rather than acute situations. Further, Davis' theory was applied to situations that permitted the development of means implying that solutions are possible. Davis deals with attempts to remove constraints on the achievement of global well-being.

Morris and Winter (1985) do not explicitly account for that kind of situation. Adaptation in their terms implies changes in the norms that prescribe housing goals rather than changes in the means for meeting housing goals. Obviously, they deal with means in the sense that residential mobility and alterations/additions to the dwelling are means. But the means to achieve mobility or alterations/additions are treated as constraints in the Morris-Winter theory. A neglected (by Morris and Winter) form of response by households is the attempt to reduce the severity of resource constraints. Such attempts involve changes not so much in the system itself as changes in the relationship of the system to its social, economic, and political environments.

An acute situation like an earthquake resulting in a sudden disruption of the adjustment-adaptation processes represents a situation where potentially pathological responses can be elicited. The Morris-Winter theory incorporates the notion of pathology in its conceptual framework. When neither adjustment nor adaptation are feasible or appropriate, pathological responses can occur.

Pathological responses include bizarre or deviant behavior such as suicide, criminal behavior and dissolution of the system through divorce or other means.

FUTURE RESEARCH

In my opinion, the greatest gaps in research on the consequences of earthquakes and other natural disasters are in the social sciences. A great deal is known about how to design buildings to withstand severe earthquakes. Little is known about how to organize a society to insure that the planning and regulation of building processes incorporates what is known into what is practiced. A great deal is known seismologically about earthquakes. Little is known about how to mitigate the consequences for individuals and households of those earthquakes.

There are two levels of social science research needed. At the macro level economic, political and sociological research is needed on national aspects of how to respond to the aftermath of an earthquake. At the micro level psychological, sociological and economic research is needed on the responses of individuals and households.

A reasonable goal of research on the effects of such events as earthquakes is to prevent the occurrence of pathological responses. Such research could investigate the feasibility of various emergency programs as counseling in connection with psychological reactions to the situation, attempts to offer temporary services of various kinds, attempts to provide emergency shelter and to quickly get households back into their own housing.

It is my opinion, however, that basic social, economic, political, and psychological research is needed to permit better understanding of human reactions (at macro and micro level) to earthquakes.

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