I. Material.

Title: Jishin to Toshi (Earthquake and Cities

Author: Murakami, Suminao

Publisher and Year: Nikkei Shinsho, Tokyo, 1973

II. Agent and/or Event.

Type of Disaster Discussed: Not specified

III. Table of Contents.

IV. Abstract (Major ideas and suggestions).

The author discussed urban disasters from the viewpoint of policy making and emphasized the lack of comprehensive studies on disasters.

Contents

Chapter 1 - Cities Which Have No Safety Devices Against Earthquake

1. A Great Earthquake Will Hit You Without Fail
2. Fear of "Material-Oriented Society"
3. When a Great Earthquake Hits Cities
4. Formulate "Anti-Disaster Science"

Chapter 2 - What Is Urban Disaster?

1. What Lessons Did Human Beings Learn from Disasters?
2. Basic Conception and Limitation of Damage Prediction
3. How Can Disaster Be Defined?
4. Reviewing Several Earthquake Disasters
   (a) The Managua Earthquake
   (b) The San Fernando Earthquake
   (c) The Peru Earthquake
   (d) The Tokachioki Earthquake

Chapter 3 - Human Society and Urban Disaster

1. History and Disaster
2. Countermeasures by Making Use of Nature: Mitigations in Foreign Countries
3. Learning from Urban Disasters
   (a) The Osaka, Ten-Roku Gas Explosion
   (b) The Osaka, Sennichi Department Store Fire
4. New Threats in Modern Cities

Chapter 4 - Reality of City and Earthquake Disasters

1. Insufficient Comprehension of a City
2. Damage Prediction by Tokyo Fire Department, and its Significance and Meaning
3. Epistemology of Materials, and Necessity of New Science
4. Risk Energy
5. Safety Management System in Cities

Chapter 5 - Development of Anti-Disaster Urban Planning

1. Kotoh Delta Chitai (Kohtoh Delta Area)
2. Development of Anti-Disaster Planning in Kohtoh Delta Area
3. Significance of the Kohtoh Area Redevelopment Planning
4. Logic of Anti-Disaster Urban Planning

Conclusions - Safe Cities for Human Beings

1. Difficulties in Ensuring Safety
2. Difficulties in Comprehending Cities
3. Anti-Disaster Urban Planning: Long Term Planning

I. Material.

Title: Shinsai Yobo no Kadai (Problems in the Mitigat and Prevention of Earthquake Disaster)

Author: Nakano, Takamasa

Publisher and Year: in Sogo Toshi Kenkyu (The Comprehensive Urban Studies), No. 2, March 1978, Tokyo Metropolita University

II. Agent and/or Event.

Type of Disaster Discussed: Earthquake

III. Table of Contents.

IV. Abstract (Major ideas and suggestions).

The article indicated three major aims and four major topics on prevention of earthquake disaster which was recognized as one of the project themes of the Center for Urban Studies, Tokyo Metropolitan University.

1. The Basic Studies for Constructing a Theory of Earthquake Prevention.

2. The Basic Studies for Constructing a Theory of Urban Disaster Prevention.

3. The Construction of a Comprehensive Theory for Earthquake Prevention, Including Socio-Economic Effects of Earthquake.

Four specific topics are:

1. Seismo-engineering studies of buildings should be reexamined from the viewpoint of earthquake disaster prevention.

2. Earthquake disasters should be studied not only from the viewpoint of seismo-engineering, but also from the viewpoint of the social sciences.

3. The effects of earthquake disasters in urban areas are clearly characterized by urban structure and functions.

4. Social scientific studies of earthquake disasters are basically necessary in order to elucidate the socio-economic damage due to earthquake.

I.Material.

Title: Studies on Human Behavior in Disasters (Saigai Kodo Kenkyu)

Author: Nakano, Takamasa and Ryoichi Kazama

Publisher and Year: in Comprehensive Urban Studies, No. 2, March, 1978, pp. 103-109, Tokyo Metropolitan Unviersity

II. Agent and/or Event.

Type of Disaster Discussed: Not specified

III. Table of Content.

1. Introduction
2. Experimental Approach to Panic Behavior
3. Inappropriate Group Behavior; Alexander Mintz
4. Nature of Panic; Enrico Quarantelli
5. Problems to be Solved

IV. Abstract (Major ideas and suggestions.).

The article consists of summaries of two articles written by Alexander Mintz and by E. L. Quarantelli. After the summaries, the authors indicated the following on the basis of the two articles.

1. A strong fear is not always a necessary and sufficient condition for maladaptive group behavior.
2. As the size of group grows, maladapted behavior by one member tends to be a powerful incentive to a breakdown of coordinated group behavior.
3. A reward structure for a behavior can explain many maladapted behaviors.
4. Panic is not irrational but non-rational.
5. Panic in disastrous situations has been overestimated.

I. Material.

Title: Systematization of Research Methods on Accute Disruption of Urban Structure and Functions in Earthquake Disasters. (Shinsaiji ni okeru Toshi no Kozo to Kino no Kyuhen ni kansuru Kenkyu Hoho no Taikeika)

Author: Nakano, Takamasa et al

Publisher and Year: in Comprehensive Urban Studies, No. 1, November, 197 pp. 5-32, Tokyo Metropolitan University

II. Agent and/or Event.

Type of Disaster Discussed: Earthquake and fires

III. Table of Content.

1. Purposes of the Study
2. Some Characteristics and Lessons of the Great Sakata Fire
3. Urban Reconstruction Program after the Great Sakata Fire
4. The Shonai Earthquake and Fires
5. Problems

IV. Abstract (Major ideas and suggestions.).

The authors discuss the accute change of urban structure and functions which result from an earthquake. They utilize several archives and historical documents. Sakata city is examined, as a model city, because it has had a number of experiences of fires and earthquakes. The events discussed are (1) the 1976 great Sakata Fire, (2) the 1894 Shonai Earthquake and fires, and (3) a number of fires the city has had since 1600.

I. Regarding the 1976 great Sakata Fire
   A. The cause of the disaster was a delay in a notification of the fire. If the Fire Department had been notified at an early stage, of the fie, the disaster could not have occurred.
   B. Water for extinguishing a fire should be cyclically used. That is, water used once should be stored via an effective sewage system and be used again.
   C. The reconstruction planning emphasized effective land use or spatial arrangements rather than the fire-proof structures of newly constructed buildings.

II. Regarding the 1894 Shonai Earthquake
   A. The physical cause of the disaster was the characteristics of the land; the softness of the land, and the liquefaction of the land.
   B. The earthquake devastated seven percent of the houses in the Sakata area and burned an area of 38.6 ha.

In conclusion, the authors indicate four problems to be solved in future studies:

1. human behavior in disasters
2. organizational responses to disasters
3. a tracing of the process of a disaster to its pre-disaster situation
4. a need to systematize the records or archives of past disasters

I. Material:

Title: '78 Miyagiken Oki Jishin Saigai no Jittai (Report on the Investigations into the Actual Condition Caused by the 1978 Miyagi-ken Oki Earthquake)

Author: Nihon Kenchiku Gakkai, Tohoku Shibu (Research Committee of the Miyagiken Oki Earthquake, 1978, Architectural Institute of Japan, Tohoku Branch)

Publisher and Year: 1979

II. Study:

(1) Agent and/or Event

Type of Disaster: Earthquake

Date of Occurrence: June 12, 1978, 5:14 p.m.

Location: Miyagi Prefecture

Casualties and Damage: Killed: 28 Injured: 10,247
Completely destroyed houses: 1,279
Partially destroyed houses: 132,594
Flooded houses: 5
Destroyed portions of roads: 1,037
Landslides: 167
Fires: 12

(2) Method

Method in detail: See the attached

Date of Study:

III. Hypothesis and Firdings.

This book consists of eight research reports on different aspects of the Miyagiken Oki Earthquake. The reports on the organizational responses by associations of contruction companies and on the damages and responses of offices are excluded from this abstract.

Chapter 1 - Damages and People's Responses to the Quake

I. Method
   A. Three methods used
      1. Questionnaires
         a) no mention about their delivery and collection
         b) sample: 6,000
         c) return ratio: 5,229 87.2%
         d) sampling procedure: Two Stage sampling from the
      2. Interviews with 100 householders
      3. Students' compositions on the earthquake.
      4. Date of study: July-August, 1978

II. On preparations
   A. Although the citizens experienced an earthquake in February of 1978, their experiences did not improve preparations.
   B. The degree of preparation was little associated with their emergency responses. Their responses were determined by the strength of the quake and the risks they perceived.

III. On Emergency Responses
   A. At home
      1. The ratio of homes which had elderly or children was high at the time of the quake. However, they first put fires out, then helped the elderly or children.
         a) other major responses
            (1) checking exits
            (2) rushing out
   B. At workplace or school
      1. Major responses
         a) stopped working and tried to define the situation
         b) hid themselves under desks or chairs
   C. In buildings they were visiting
      1. In many cases (about one quarter of all cases), there was sudden darkness due to the failure of inside emergency lights
      2. Major responses
         a) rushed out
         b) clung to nearby pillars
         c) cowered
   D. Outside
      1. They had a stranger fear than people in houses or buildings.
      2. Two major responses characteristic of people outside

a) cowered or fell on their legs
b) helped children or people who were old or handicapped

E. Men, as a whole, tried to define the situation, while women quickly responded with actions such as putting fire out or helping children or the elderly.
1. Women's quick actions seemed to reflect the customary roles of women.

F. Behaviors in the 15 minutes after the quake.
1. Cleared away the debris
2. Went home
3. Checked other people's safety
4. Gathered information by phone or radio

Chapter 2 - Damages and Responses by Several Social Facilities

I. Medical facilities
A. Method
1. Structured interviews with staffs of 20 hospitals in June-July, 1978

B. Findings
1. Building-structures of hospitals were quite safe. Most damages were caused to internal facilities, medical equipment, and furniture. Furthermore, the energy systems in hospitals suffered severe damages. Since electricity and water are indispensable, the hospitals should have had substitute systems, such as emergency generators or deep wells.

II. Child Welfare Institutions
A. Methods
1. Interviews with staffs of 16 institutions in June-August, 1978

B. Findings
1. Since the quake occurred in the evening, there were no severe problems.
2. The number of chilren is usually much more than that of teachers or staffs. Therefore, it is essential for these institutions to secure inside safety-corners and evacuation routes.
3. Another possible problems will be how to let parents know about the condition of their children.
a) In this earthquake, radios provided this kind of information.

III. Facilities for the handicapped
A. Method
1. Structured interviews with staffs of 25 facilities in June-August, 1978.

B. Findings
1. There was overlap between evacuation practices for fires and earthquakes. Usually, there were not many practices for earthquakes, but for fires. So some people responded to the quake as they had practiced for fires. As a result, they evacuated by passing through dangerous parts of buildings.

2. Different facilities took different responses measures.
   a) Major responses
      (1) let the handicapped stay in their rooms
      (2) let them gather in the hall or tearoom
      (3) let them gather outside
3. The different responses seemed to be due to the type of inmates in the institutions. In the cases of facilities for mental disability, facilities whose inmates were adults let them gather outside, while facilities for mentally disables children let them gather in a certain place inside.

IV. Welfare institutions for the elderly
   A. Method
      1. Structured interviews with staffs and inmates of 20 institutions during June 29-August 19, 1978
   B. Findings
      1. Although most inmates will need some help in emergencies, the proportion of staff personnel to inmates is very low. As in the case of child welfare institutions, this will cause a major problem, especially at night.
      2. Disaster drills had been carried out in most institutions. The drills had always involved staffs but only certain of the inmates. As a result, the drills could not be brought into effect in most emergencies.
      3. Not all of the staffs were familiar with how to operate equipment or facilities. Therefore, some of them failed, for example, to control sources of fire.
      4. Most institutions were equipped with slides for evacuating inmates. Since the slides did not work as expected, the efficiency of the slides should be checked from a psychological or medical viewpoint.

V. Meeting places
   A. Method
      1. Interviews with staffs of 25 public meeting places
      2. Study conducted June 29-July 29, 1978
   B. Findings
      1. As a whole, little damage was reported. It should be noted that most bookshelves in stockrooms feel down.
      2. In some cases, since equipment such as lockers or bookshelves were located in passageways, they could block evacuation routes.
      3. Staffs should always be informed about who and how many people will be using the meeting rooms.

Chapter 3 - Damages and Reconstruction Process of Newly Developed Area

I. Method
   A. Interviews with representatives from two organizations of people who had damages (2 representatives)
   B. Questionnaries delivered and collected by researchers
      1. Samples: 821 households
      2. Date: September 11-20, 1978

II. Findings
   A. An indirect cause of the disaster was the high demand for and building of houses in rapidly growing urban areas.
   B. Some weaknesses of regulations about house-construction were made clear.
   C. Three factors complicated the reconstruction process
      1. Difficulties in suspending or restricting the ownership of land.
      2. Ambiguous responsibility for managing the space.
      3. Difficulties in evaluating the degree of damages.
   D. Recognition of the degree of damage was influenced by
      1. Perception of superficial characteristics of their and others' damages
      2. Information on damages from governments or other community organizations.
   E. On the other hand, their recognition of their damages affected
      1. The kind of emergency measures
      2. Their evacuation behaviors
      3. Consciousness about the safety management system in the area

Chapter 4 - Damages and Responses in Nearby Agricultural Areas

I. Methods
   A. Questionnaires for three areas
      1. Sample
         a) All households which were defined by the local government as "totally collapsed"
            (1) 103 houses
         b) 267 households chosen by a probability proportionate sampling
      2. Date of study: August, 1978
   B. Interviews
      1. No details mentioned
      2. Date of study: March, 1979

II. Findings
   A. Some unique problems to agricultural areas were made clear
      1. The farmers could not easily move out in spite of their recognition that their lands were highly vulnerable to an earthquake.
      2. The ordinary urban planning process excluded the agricultural areas.
      3. Farming in these days is done mainly by the elderly and women. As a result, most farm houses are composed of women and the elderly. Furthermore, modernization has weakened the traditional ties of mutual assistance among farmers. These characteristics of modern agricultural areas should be taken into consideration in planning countermeasures.

Chapter 5 - Damages and Reconstruction of High-Rise Residential Buildings

I. Methods
   A. Interviews with residents of eight high-rise residential buildings; July-October, 1978

B. Interviews with managers of 94 high-rise residential buildings; October, 1978
C. Questionnaires delivered and collected by researchers
1. Sample
a) 805 residents in 13 high-rise residential buildings
2. Date of study: October, 1978

II. Findings
A. Although some damages of external structures were reported, damages to internal facilities such as doors, walls, windows, or maintenance systems were far more extensive.
B. Many injuries were reported which resulted from the falling-over of furniture in high-rise residential buildings.
C. The degree of damage varied according to the floor. That is, the higher the floor, the more the damages.
D. Emergency responses were determined by
1. If residents were using a fire
2. If they had children or elderly
E. Disruption or breaking down of maintenance systems was compensated by individual efforts rather than by cooperative efforts of residents and management companies. A cooperative system in emergencies for residents should be established.
F. Residents in high-rise buildings had little knowledge about the building structures and the appropriate responses to an earthquake. Buyers of units of high-rise residential buildings should be provided with such information.
G. The reconstruction processes of high-rise buildings had some unique features.
1. It was difficult to distinguish the private spaces from the shared public spaces.
2. The need for specialized knowledge and skills to manage high-rise buildings left residents uninformed about the reconstruction process.

Chapter 6 - Damages and Reconstruction of Urban Facilities

I. Method
A. Interviews with eight related organizations' staffs in July, 1978 and February, 1979

II. Findings
A. Roads
1. A major highway was closed to traffic. Twenty-eight national and prefectural roads, and twelve muncipal roads were closed. Furthermore, because of the breaking-down of traffic signals, the traffic conditions in downtown were bad until the late evening. Some measures for preventing the breaking-down of traffic signals will be necessary.
B. Railways
1. All trains stopped because of the disruption of electricity but no accidents were reported. Since the railways are highly dependent upon the electric company, they should establish an emergency cooperation system with the electric company.

C. Water supply
   1. Over seven thousand households suffered from the disruption of the water supply.
D. Electricity
   1. Electricity was disrupted in the entire area of Sendai. Recovery was smoothly and quickly done through the emergency network among several major electric companies.
E. Gas
   1. Gas service was also totally disrupted. They should build multiple pipeline systems so that all lines into an impacted area will not be damaged.
F. As a whole, there is a need for a certain system which can be substituted in emergencies so that the energy supply in urban areas can be secured.

I. Material.

Title: Dai Jishin ni Ikinokoru-Ho
(Techniques on How to Survive an Earthquake)

Author: Ohta, Hideoki

Publisher and Year: Tokyo Sports Newspaper Co., Tokyo, 1977

II. Agent and/or Event.

Type of Disaster Discussed: Earthquake

III. Table of Contents.

Chapters on:

1. Emergency Responses to Earthquakes
2. Evacuation
3. Emergency Time Life
   a. Clothing
   b. Food
   c. Housing
4. Preparations Against Earthquakes
5. Countermeasures
6. Predictions of Earthquakes

IV. Abstract (Major ideas and suggestions).

I. Material:

Title: Jishin Joho no Dentatsu to Jumin no Hanno (An Analysis of Individual and Group Responses to the So-called After-shock Information)

Author: Okabe, Keizo et al

Publisher and Year: Shimbun Kenkyu-sho (Institute of Journalism and Communication), University of Tokyo, 1978

II. Study:

(1) Agent and/or Event

Type of Disaster: Earthquake

Date of Occurrence: January 14, 1978

Location: Shizuoka Prefecture, Izu area

Casualties and Damage:

Not mentioned

(2) Method

Method in detail:

(1) Interviews and questionnaires answered by mail

(2) Samples: Shimoda City - 300
Numazu City - 200
Return ratio: Shimoda - 54%, Numazu - 48.5%

(3) Interviews with 714 housewives in Numazu City.

Date of Study: January 21-24 and February 10-19, 1978

III. Hypothesis and Findings.

I. Dissemination of "After-shock Information"

A. January 14, 1978 - the major quake

B. January 18, 1978 - the issuing of "After-shock Information" by the prefectural government

C. The information flows

1. There is an administrative route. This goes through local governmental offices. It involves the slowest flow of information, but reaches almost all residents of an area.
2. There is a mass-media route. This involves the second quickest flow of information. Unlimited number of persons can be reached by such a flow.
3. There is a propane-gas-company route. The information flows quickest by this route but gets only to certain people.

D. Most people responded to the "After-shock Information" by confirming-behaviors.

E. The information was more severely and badly transformed in those areas where there were relatively small damages rather than in those areas of greatest damage.

F. People who received information from others in private personal communication tended to create rumors.

G. Persons who believed a rumor in the after-shock period

1. Shimoda City 44.6%
2. Numazu City 69.1%

H. Reasons they believed rumors

1. Their earthquake experiences two years ago
2. Trust they had in the source of information

I. Reasons they did not believe rumors

1. They doubted the possibility of scientific prediction
2. Experiences in the past
3. Distrust in the source of information

J. People who attempted to confirm the information they received

1. Shimoda City 25.0%
2. Numazu City 20.0%

K. Passive confirming-behavior such as listening to a radio or watching television was dominant. People who tried to actively confirm information by making a phone call to public organizations were

1. Shimoda City 15.0%
2. Numazu City 9.0%

L. Some major factors which affected the acceptance of a rumor

	(Partial Correlation)
1. Anxiety and fear	0.403
2. Surprise at being in a major quake	0.265
3. Higher education	0.221

M. Responses to the "After-shock Information"

	(Shimoda City)	(Numazu City)
1. Did nothing special	22.2%	28.1%
2. Some preventive measures such as putting fire out, mental preparation, communicating with a family member	23.4%	13.5%
3. Prepared for evacuation	27.2%	46.1%
4. Evacuated	1.9%	0.0%

N. Characteristics of people who did nothing special
   1. Low anxiety about an earthquake
   2. Limited trust in prediction information
   3. Mild concern about disaster information on TV
   4. They also were less accepting of a rumor.
   5. Less likely to attempt to confirm the rumor
   6. Less likely to transmit a rumor to others

I. Material.

Title: The Earthquake Prediction Warning and the Social Responses, Part II (Zoku Jishin-Yochi to Shakaiteki Hanno)

Author: Okabe, Keizo et al

Publisher and Year: University of Tokyo Press, 1981

II. Agent and/or Event.

Type of Disaster Discussed: Experiment

III. Table of Contents.

This book consists of five research reports.

Chapter 1 - People's Response to an Earthquake Warning, Part I

See the summary of Report of the Survey Research on People's Responses to an Earthquake Prediction Warning by Okabe, Keizo et al, Institute of Journalism and Communication, University of Tokyo, 1979.

Chapter 2 - People's Responses to an Earthquake Warning, Part II

See the summary of The Study of the Responses to Earthquake Prediction, Part II by Ikeda, Kenichi et al, Institute of Journalism and Communication, University of Tokyo, 1980.

Chapter 3 - Responses to TV News "Earthquake Warning"

See the summary of "Responses to TV News 'Earthquake Warning'" by Okabe, Keizo et al, 1980.*

IV. Abstract (Major ideas and suggestions).

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*Chapter 4 - Experimental Study on Insurance Purchasing Behaviors

See the attached for the summary.

Chapter 5 - A Disaster Warning and Responses of Residents

See the summary of A Disaster Warning and Responses of Residents: A Study of Evacuation Behavior During a Warehouse Fire in Ohbu City by Okabe, Keizo et al, Institute of Journalism and Communication, University of Tokyo, 1981.

I. Material:

Title: Survey Research on the Attitude of Tokyo Residents Toward the Prospective Earthquake and the Prediction Warning. (Saigai ni kansuru Tomin no Ishiki Chosa.)

Author: Okabe, Keizo et al

Publisher and Year: in The Earthquake Prediction Warning and the Social Responses (Jishin Yochi to Shakaiteki Hanno) edited by Institute of Journalism and Communication (Shimbun Kenkyusho), University of Tokyo, pp. 137-303, 1979.

II. Study:

(1) Agent and/or Event

Type of Disaster: Hypothetical earthquake

Date of Occurrence:

Location: Tokyo, Japan

Casualties and Damage:

(2) Method

Method in detail: See the attached

Date of Study: See the attached

III. Hypothesis and Findings.

I. Stratified sampling
   A. 1,500 persons chosen from the voters' list, 15 persons from each of 100 voting areas
   B. Valid answers
      1. 1,093 72.9%
   C. Structured Interviews
      1. January 18-28, 1978
   D. Possibility of scientific prediction

Predictions of	Possible	Impossible	Don't Know (NA)
Time	67.7%	23.2%	9.1%
Area	72.6%	16.1%	11.0%
Magnitude	50.8%	31.0%	17.9%

      1. Women are more likely to think that scientific prediction of time is possible.
      2. Young women are more likely to trust the scientific prediction.
      3. People with more education, rather than people with less education, tend to think that scientific prediction of earthquake is possible.
      4. In comparison with other categories professionals, managers, company or store owners, and clerical workers are more likely to think that prediction for the area is scientifically possible.
      5. Car-owners and people who have bought earthquake insurance tend to think that scientific prediction is impossible.
      6. Relationships to personality
         a) the optimists tend to be pessimistic about the possibility of prediction
         b) people who have a scientific attitude tend to think that predicting magnitude is not possible, but predicting area is possible
   E. On the perception of natural phenomena as possible symptoms of earthquake

	yes	probably	no	don't know (NA
1. catfish acting violently	14.6	50.2	21.3	13.8
2. rumblings of the ground, etc.	10.6	44.7	15.2	29.2
3. no wind, or heat	8.9	43.2	19.9	27.8
4. a pheasant cries	4.8	26.8	27.3	41.0
5. a special rainbow	1.8	17.0	32.3	48.9
6. a devine message or fortune telling	0.9	8.1	70.5	19.8

   F. There were four types of attitudes toward earthquake prediction, differentiated by the degree of trust in prediction possibility and in the acceptance of natural phenomena indicators as symptoms:
      1. Type I: Distrust in scientific prediction
      2. Type II: Trust in scientific prediction
      3. Type III: Trust in natural symptoms
      4. Type IV: Trust in everything

5. People of Type I tend to distrust prediction information issued by public organizations, while people of Type IV tend to trust.
6. People with a high educational background tend to be Type IV, while people with a lower educational background tend to be Type I.
7. People in their 20s tend to be Type IV, while people in their 60s tend to be Type I.
8. People in their 30s or 40s tend to be Type II.
9. People of Type III are characterized by their optimistic nature.

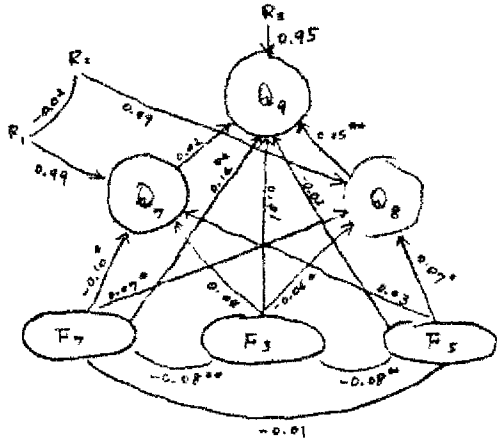
G. Responses to prediction information (multiple choice)

1. Do nothing	3.0%
2. Prepare for removal of valuables	67.1%
3. Prepare for emergency food	65.5%
4. Check on evacuation place	58.3%

5. People in their 20s are likely to do nothing in response to prediction information, while people in their 40s or 50s do something.
6. Unmarried persons are likely to do nothing.
7. The greater their income is, the more they prepare in response to prediction information.
8. People in their own houses are more likely to prepare in response to prediction information, rather than people in rented houses.
9. People who prepare well in response to prediction information are more likely to trust prediction information.
10. People who prepare well tend to have greater fear.
11. People who prepare well tend to predict their own damages to be larger due to an earthquake.
12. The higher the educational background, the more the preparation.

H. Two models relating demographic factors, anxiety about an earthquake, and desire to move:

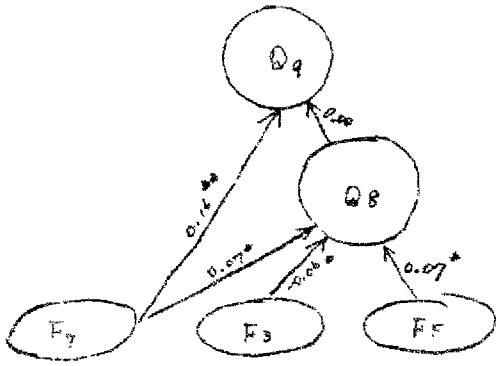
Recursive Model



F3: level of education
F5: family size
F7: density of houses
Q7: knowledge of evacuation places
Q8: anxiety
Q9: desire to move

*p < .05
**p < .01

Overidentification Model



1. From the recursive model, it can be said that "knowledge of evacuation places" is not an intermediate variable, but "anxiety about an earthquake" is.
2. From the overidentification model, it can be said that three demographic factors (F3, F5, F7) and "anxiety about an earthquake" have significant direct effects on "anxiety about an earthquake" and "wishfulness of house moving," respectively. However, "anxiety about an earthquake" does not play a role of an intermediate variable.

I. How people obtain information about a disaster

1. TV or radio	67.7%
2. Newspaper	55.8%
3. P.R. by local government	24.2%
4. Weekly or monthly magazine	8.7%
5. Books	7.5%

6. People who have less contact with information about an earthquake
   a) people in their 20s
   b) unmarried persons
   c) people whose incomes are low
7. People who have frequent contact with information about an earthquake
   a) people who live in their own houses (not in rented houses)
   b) people who live in separate houses (not in apartments)
   c) people who bought the earthquake insurance
   d) people who are the members of self-governed neighborhood organizations
8. Relationships of "frequency of contacts with the information" with several other variables
   a) the more frequently people come into contact with the information
      (1) the more they trust "an earthquake prediction"

(2) the more they prepare against an earthquake
(3) the stronger their anxieties are
(4) the stronger their desires to move are
(5) the more severe damages they predict
(6) the more frequently they talk at home about

9. Factor analysis of "frequency of contacts with the information"
   1. The following are positively associated with the frequency of contacts with the information

	(Partial correlation)
a) anxiety	0.187
b) level of education	0.108
c) knowledge about evacuation places	0.104
d) optimistic personality	0.101

J. Damage Prediction
   1. By asking about predictions regarding damages in their neighborhoods and in Tokyo as a whole, four types of predictors can be classified:

(Damage) in Tokyo / in Neighborhood	Small	Great
Small	Type 1 22.5%	Type 3 17.9%
Great	Type 2 40.7%	Type 4 18.8%

   2. The greater their income, the more they will be Type 1 and the less they will be Type 4.
   3. People who live in their own houses tend to be Type 1, and people who live in rented houses tend to be Type 4.
   4. People who trust n earthquake prediction information tend to be Type 1.
   5. Factor Analysis of "damage prediction"

	(partial correlation)
(determinant factors of damage prediction)	
a) anxiety (positively associated)	0.222
b) structure of their houses (People who live in wooden houses tend to predict the greatest damages, and people who live in reinforced concrete houses tend to predict the least damages.)	0.173
c) age (the older, the greater damages they predict)	0.161
d) personality (Optimistic persons predict the smaller damages, and pessimistic persons predict the greater damages.)	0.146

e) density of housing (People who live in the area of greater housing density tend to predict the greater damages.) 0.135

K. Sources of information which people will trust after the quake

1. TV or radio 55.8%
2. Governments, police, or fire departments 37.1%
3. Newspaper 3.8%
4. Don't know; NA 1.6%
5. Neighbors 1.3%
6. People in their 20s or 40s tend to trust TV or radio, while people in their 50s or 60s trust more governmental information.
7. People who had experienced disasters tend to trust the governmental information, while people with no experience tend to rely upon mass media.

L. Conversations at home about emergency responses

1. Four major topics of conversation at home
   a) on what they should do first 60.5%
   b) on what they should prepare 69.7%
   c) on where and how they should make contacts with each other 43.6%
   d) on where they should evacuate 39.9%
2. Factor analysis of "frequency of conversations at home"

(partial correlatio

(determinant factors)

a) frequency of contacts with information (The more frequently they are in contact with information about a disaster, the more frequently they have a conversation.) 0.171
b) perceived possibility of safe evacuation (People who think that they can safely evacuate tend to more frequently have conversations at home regarding evacuation.) 0.175
c) anxiety (The greater their anxieties, the more frequent their conversations.) 0.138
d) sex (Women tend to more frequently have these conversations than men.) 0.106
e) age (The elderly rather than youth tend to more frequently have conversations.) 0.103

I. Material:

Title: Jishin Yochi Joho eno Taio (A Survey Research on People's Responses to an Earthquake Prediction Warning)

Author: Okabe, Keizo et al

Publisher and Year: Shimbun Kenkyusho (Institute of Journalism and Communication), University of Tokyo 1979

II. Study:

(1) Agent and/or Event

Type of Disaster: Earthquake

Date of Occurrence:

Location: Shimizu City and Fukuroi City, Shizuoka Prefecture

Casualties and Damage:

(2) Method

Method in detail: Interviews with Questionnaires.
Samples: Shimizu City; 990, Fukuroi City; 660
(Total; 1,650)
The Sizes of Population: Shimizu City; 165,088
Fukuroi City; 29,527
Sampling Procedure: Probability Proportionate Sampling.
Return Rate: Shimizu City; 90.6%, Fukuroi City; 88.6%

Date of Study: February 21-26, 1979

III. Hypothesis and Findings.

I. Knowledge on earthquake and prediction methods
   A. The younger they are, the more they know.
   B. Men know more that women.
   C. Those who perceive the large possibility of danger are likely to know more than those who perceive less.

II. Degree of trust in earthquake prediction
   A. More than half of the respondents think that earthquake prediction is technically possible.
   B. Younger people are likely to think that it is technically possible.
   C. The more highly educated are likely to think that it is technically possible.
   D. Those who perceive the large possibility of danger are likely to think that it is technically possible.

III. Responses to earthquake prediction information
   A. The major responses
      1. Listen to radio or watch TV (over one third of respondents).
      2. Make a phone call to the family (approximately one half of respondents).
      3. Go home or go to meet a member of the family outside (approximately one half of respondents).
      4. Put out the fire or turn off the gas (over two thirds).
      5. Evacuate (approximately two fifths).
   B. Those who want to go home tend to use a car or a bicycle, while those who want to evacuate tend to walk.
   C. Major determinants of these responses
      1. Age, occupation, and the degree of trust in the prediction information affect the responses. That is, the young salaried-workers, the persons with infants or elderly dependents, the people who often talk about earthquakes at home, and the people who trust in warnings are likely to take quick and active responses.
   D. Preparation against earthquake
      1. Few people have often discussed at home how to respond to an earthquake (only 12%)
      2. Their major preparations against earthquake
         a) flashlights, transistor radio, and an extinguisher
         b) packing important things to be easily removed during an emergency period
      3. Age, income, and the degree of anxiety about an earthquake, are positively associated with the degree of concern with preparations against earthquake, respectively.

I. Material:

Title: Keikai Sengen wa Donoyoni Uke Torareruka (Responses to T.V. News "Earthquake Warnings")

Author: Okabe, Keizo et al

Publisher and Year: Shimbun Kenkyusho Kiyo (The Bulletin of Institute of Journalism and Communication), Vol. 28, 1980

II. Study:

(1) Agent and/or Event

Type of Disaster: Hypothetical earthquake

Date of Occurrence:

Location: Tokyo

Casualties and Damage:

(2) Method

Method in detail: See the attached

Date of Study:

III. Hypothesis and Findings.

I. Method

A. Two kinds of questionnaires
   1. One asked about general attitude toward an earthquake
   2. One was administered after the samples looked at a video-taped TV program on the process of issuing an earthquake warning

B. Both kinds of questionnaires were administered to the same samples

C. Sample
   1. 168 housewives in their 30s and 40s who live in Tokyo

D. The samples were randomly split into six groups.

E. The video-taped TV program consists of three parts.
   1. From finding symptoms of a possible earthquake to the consensus of the judgement committee (the committee composed of earth scientists for evaluating the data and making suggestions to the Prime Minister)
   2. From the release of the results by the committee to the explanation of the results by TV announcer
   3. The issuing of a warning, and recommendations on preparations and countermeasures

F. The six experimental groups views different parts of the video-taped TV program
   1. Group 1 - Part 1 only
   2. Group 2 - Part 1 and 2
   3. Group 3 - All parts
   4. Group 4 - Part 2 only
   5. Group 5 - Part 2 and 3
   6. Group 6 - Part 3 only

G. The study was done August 4-5, 1979

II. Findings

A. General attitude toward an earthquake
   1. Most people had strong or relatively strong anxieties about an earthquake. 85.0%
   2. Predicted damages in their residential areas
      a) percentage show the ratio of persons who indicated the item as possible
         (1) major fires 60.1%
         (2) collapse of houses 64.3%
   3. Their predictions about damages to life-line functions are not so pessimistic.
   4. The ratio of persons who knew the correct definitions of "magnitude" and "intensity" 58.3%
   5. Places people thought of as extremely dangerous
      a) subway 28.6%
      b) underground shopping mall 23.2%
      c) elevator 20.2%
      d) streets surrounded by high-rise buildings 12.5%
   6. The sample size is not large enough to generalize the findings.

B. Persons who looked at more parts of the TV program understood the content more correctly. That is, fragmentary information caused misunderstandings.

C. Since some special terms such as "magnitude" or "Keikai Sengen" (it literally means "the declaration of a warning or imminent stage") are difficult to be correctly understood, they should be used with caution.

D. Persons who watched only a part of the TV program tended to think that the program was difficult for them to understand.

E. Major predicted responses in an earthquake right after people watched the program

1. Contact family member or relative, mainly by phone	approximately 56.0%
2. buy or prepare food	approximately 54.0%
3. put fire out	approximately 51.0%
4. prepare for saving valuables	approximately 46.0%
5. make water provisions (for drinking or extinguishing fires)	approximately 42.0%

F. After they watched the programs, many inter-personal communications emerged. There is a high possibility that ideas were modified as a result of these inter-personal communications.