

ORGANIZATIONAL-ENVIRONMENTAL PROCESSES IN RESPONSE TO THREAT*

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INTRODUCTION

This paper develops a conceptual scheme for the description and analysis of the organizational-environmental processes that occur as a result of massive and relatively quick environmental change. The scheme consists of four dependent variables representing general response processes which are ranked on a continuum of increasing organization-environment interaction. A number of explanatory or independent variables are then introduced to complete a theory which attempts to explain why some organizations respond more actively than others when faced with a massive and sudden environmental change and what types of change or other response behavior will be typical of various types of organizational units.

The theory was originally devised, and will be used here, for the analysis of one specific environmental change – the introduction of a scientifically credible earthquake prediction for an urbanized area. Since such a prediction

is likely to be released several months or even years before the earthquake is expected to occur (the possible lead time increases as the magnitude of the predicted quake increases) such a prediction may have severe social, economic and political implications above and beyond the threat of the earthquake itself. (For instance, population growth in the prediction area is likely to decrease or even reverse, business activity will probably slow substantially, credit will become difficult or, in some cases, impossible to obtain, etc.) These effects are likely to compound one another enough to create a social, economic, and political emergency even before the earthquake occurs. At the same time, organizations will be faced with the decisions involved in preparing themselves for the predicted – but still future – physical mass emergency situation (the earthquake itself).

The theory presented here attempts to explain why some organizations faced with this type of emergency situation will essentially ignore it and go on as if nothing had occurred, while other organizations will take major steps to adapt to the new environmental situation (such as leaving the area completely, changing a majority of their work activities, forming new coalitions with other organizations, trying to change public opinion, legislation, etc.).

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The same framework can presumably also be applied to study the effects of several other types of environmental change, for instance, actual physical disaster (earthquake, hurricane, flood, etc.) or social "disaster" (major depression, riot, war, etc.). While there are important analytic differences between each of these collective stress situations (see Barton, 1969; Mileti et al., 1975) there are also interesting parallels which are highlighted by this framework. The theory further appears to be useful for the analysis of organization-environmental interaction in a relatively stable or slowly changing environment, the sort of study which is much more common in the organizational literature to date (e.g. Thompson and McEwen, 1958; Segal, 1974; Levine and White, 1961). Although the focus of most of the related literature is different from that to be used here, a brief review of some previous works will be helpful [1].

James D. Thompson and William J. McEwen were among the earliest theorists to emphasize the environmental impact on organizational behavior (Thompson and McEwen, 1958). They argue that the process of goal setting is essentially the process of defining the relationship between an organization and its environment, and thus goal setting is an interaction process between organizations and environmental factors. They also propose that the character of this interaction process for any particular organization is determined in part by that organization's position on a continuum of organizational power in environmental relations. This continuum ranges from one extreme at which an organization's behavior is entirely controlled by environmental factors to the opposite extreme where the organization controls portions of its environment to meet its needs. Clearly almost all organizations fall somewhere in the undefined middle ground; the definition of this middle ground will be further explored later.

The next important theoretical development

in organization theory was the application of general systems theory to organizational studies (Emery and Trist, 1965; Thompson, 1967; Lawrence and Lorsch, 1967; Katz and Kahn, 1966). Among the important ideas of this metatheory are (1) that organizations are open systems which are constantly in interaction with their environments which are also open systems, and (2) as such open systems, organizations have feedback processes which allow for organizational adaptation to environmental change.

This perspective opened up a whole new area of investigation which primarily focused on stable or evolutionary interorganizational and environmental-organizational relations, for instance, organizational adaptation to the evolutionary increase in environmental complexity and rate of change ("turbulence," as coined by Emery and Trist, 1965). Adaptive mechanisms which have been suggested for this situation include the formation of increasing numbers of interorganizational links (Emery and Trist, 1965), active interorganizational communication (Terreberry, 1971), active search for and implementation of advantageous organization-environment relations (Terreberry, 1971), environmental monitoring (Mileti and Gillespie, 1976) and environmental forecasting (Thompson, 1967).

A few other theorists have considered the problem of organizational adaptation to rapid, short-term environmental change. Among the theorists in this area are Haas and Drabek (1973) who developed an entire theoretical perspective for the study of organizations based on the concepts of organizational stress and strain (which are highly related to rapid environmental change) and Mileti and Gillespie (1976) who developed a formalized, integrative theory of organization-environment relations which they apply to both "evolutionary" (long-term, relatively slow) and "mutational" (short-term and rapid) environmental change.

The theoretical scheme that follows is another integrative attempt, which draws ideas

from all of the above sources while applying them to a more specific problem than those dealt with above. This problem is, of course, the determination of the level of activism (or organization-environmental power as suggested by Thompson and McEwen) which is elicited by a mass emergency situation.

ORGANIZATIONAL ADAPTATION PROCESSES: A CONCEPTUAL SCHEME

Although organizations are constantly making minor adjustments in their behavior patterns to adapt to similarly minor changes in their environment, the adaptation processes become much more evident when they are made in response to a massive and relatively quick environmental change. When such a change occurs four levels of response become apparent.

The first, and least active response is environmental monitoring – the process of accumulating knowledge regarding the specific nature and probable effects of the environmental change. Strictly speaking, this monitoring process can be either passive or active (organizations can simply wait until somebody tells them about the change and its impact, or until the impact is directly felt, or they can actively seek out as much information from external sources as is available). For example, in the case of organizations responding to an earthquake prediction, some will basically ignore it until another organization directs them to respond, or until the impact is felt in decreasing revenues, profits, or even an earthquake. Others will actively seek out information – about the credibility of the prediction, about the government and citizen response – and attempt to assess the impact that these changes will have on the organization. It is this sort of active behavior that we will call environmental monitoring – being hit over the head with environmental impact does not count.

The next and more active type of adaptive

response is defensive responsiveness or defensive change. These are changes made in an organization's behavior or planned behavior that are meant to protect the organization from any possible negative effects of the environmental change. Defensive behavior in response to an earthquake prediction, for example, might vary from changing location of the organization to an area of presumed safety, to decreasing the inventory and staff to minimal levels, or to implementing safety plans and precautions for the time of impact. Each of these examples suggests a different conceptual dimension of adaptation; in fact there are three: locational change, resource change, and normative change. Any or all of these categories of change might be pursued as a manner of protecting the organization from what is deemed to be a threatening change in the environment.

A third possible adaptive process is opportunistic change. This category is meant to include any organizational change which is meant to somehow enhance the organization's position in reference to its environment beyond what it had been before the environmental change, for instance, enhancing its autonomy, security, and/or prestige [2]. It should be noted that this definition differs from the more common definition of opportunism used in organization literature which refers to careless and short-sighted responsiveness without consideration of principles or long-term results. While my use of the term would include such behavior it also includes responsible, but quick, positive adaptation to external change.

Like defensive responsiveness, opportunistic responsiveness may involve location change (expanding to fill a void in an existing or newly forming market), a resource change (adding organizational resources to enable the organization to expand its production or service), or a normative change (for instance an enlargement of domain whereby an organization would begin performing new and different

functions within its environment). Any or all of such opportunistic changes may be made by an organization as a response to an environmental change together with or instead of defensive responses.

Finally, the last and most active response in this continuum is termed organizational activism – the process whereby an organization attempts to change the environment instead of or in addition to changing itself in order to maintain the equilibrium between itself and the environment. Types of activist responses include attempts to change public opinion and/or behavior, attempts to change competitive, subordinate, and/or superordinate organizations' behavior, and attempts to change the political or legal structure to the advantage of the organization.

When considered together, these four types of adaptive processes form a continuum of organizational activism with respect to the environment which is similar to Thompson and McEwen's continuum of organization-environmental power (Thompson and McEwen, 1958). An organization which is not at all active, but which simply gets hit with surprise environmental changes and responds as it must is essentially controlled by the environment. At the other end of the continuum is the activist organization which attempts to, and possibly succeeds, in changing portions of the environment to meet the needs of the organization. To the degree to which it succeeds, it approximates the organization which is dominant in all its environmental relations. To the degree to which it fails – and to the degree to which it responds with other types of adaptive changes, monitoring, defensive, and opportunistic change, it can be placed on a crude scale of organization-environmental power – a scale covering the middle part of the Thompson-McEwen continuum.

EXPLANATORY VARIABLES: WHAT DETERMINES RESPONSE?

As we interviewed organizations in our study of the Socioeconomic and Political Consequences of Earthquake Prediction, it became increasingly clear that organizations differed greatly in their placement on this continuum; some organizations indicated they would respond to the prediction in ways that covered all of the conceptual categories of activism, some indicated that they would essentially ignore it, and most were somewhere in between. What determined an organization's level of activism became a question of obvious interest. While past research did not have a specific answer to this question, the literature on organization-environment relations did suggest a number of possible explanatory variables. These variables, and the related propositions are summarized in the form of a causal theory shown in Fig. 1 [3].

While a number of the independent variables relate to two or more of the dependent variables, the sets of variables used to explain each of the response categories is considerably different. Thus for the purposes of discussion, we will divide the theory up according to dependent variable and discuss each of these groups of propositions individually. Two things should be noted now though, while the theory is still being discussed as a whole.

The first is that there are three major independent variables, demand increase, demand decrease, and organization vulnerability to the environmental change which combine in various ways with two crucial intervening variables (flexibility and power) to determine the various types of organizational response [4].

Another important point to note is that environmental monitoring acts as both a dependent and an independent variable. It is dependent insofar as it is the first category of response on the activism continuum and is of interest by itself in that respect. At the same time it is thought to be a major factor in

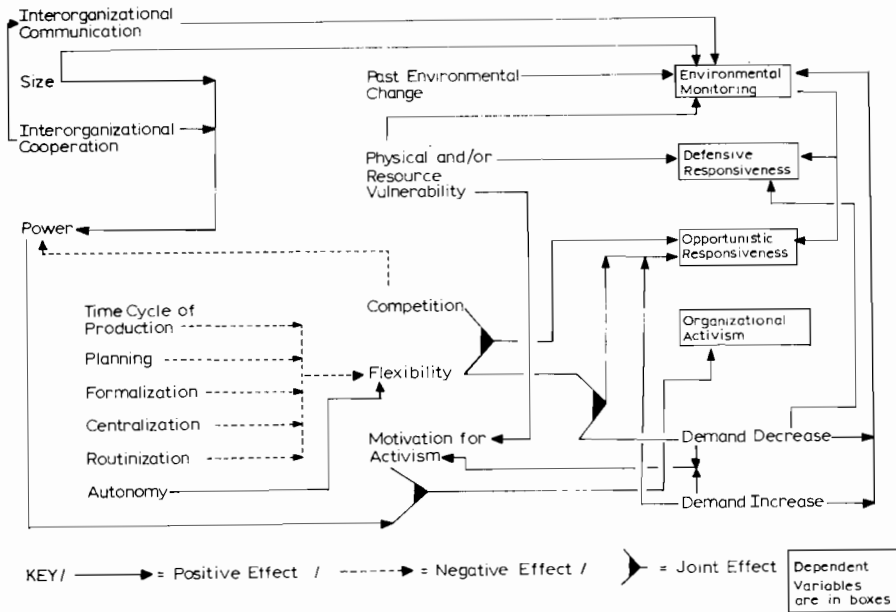


Fig. 1. An organizational response to environmental change: a theory

determining the other categories of response as well, in that organizations which do not know that the environment has changed can hardly respond to the change in any purposeful manner.

The rest of the discussion will be simplified by considering the dependent variables separately. Nevertheless, the reader is encouraged to refer back to Fig. 1 whenever necessary to review a particular variable's position in the overall scheme.

DETERMINANTS OF ENVIRONMENTAL MONITORING: PROPOSITIONS

Five variables are shown to be positively related to environmental monitoring; these are size, past organizational experience with environmental change, interorganization cooperation and communication, and vulnerability (including physical, locational, and demand vulnerability) to the specific environmental change.

The first variable, size, is suggested by Haas and Drabek (1973) as being positively corre-

lated with environmental monitoring. They suggest that the range of "member skills and competencies" limit the extent to which an organization can monitor the environment, thus an increase in organizational size (as measured in terms of numbers of members) increases the likelihood that such monitoring will take place.

The second variable suggested to be positively related to environmental monitoring is past organizational experience with environmental change; this is meant to be a partial operationalization of the more common and more difficult to measure variable of environmental complexity and rate of change, or "turbulence"

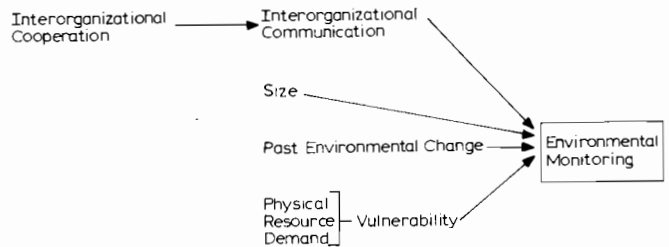


Fig. 2. Determinants of environmental monitoring: propositions

as discussed before with reference to Emery and Trist (1965). Mileti and Gillespie suggest that “an increase in environmental complexity [their term for turbulence] results in an increasing need for the focal organization to monitor the environment” (Mileti and Gillespie, 1976: 92). It is assumed here that surviving organizations with complex or turbulent environments will fulfill this need and thus organizations with much past experience with environmental changes will tend to monitor the environment more than those which are situated in a relatively stable environment, have had little experience with past environmental change, and thus have had little need for monitoring the environment before.

Another positive relationship links the amount of interorganizational communication (and further, the amount of interorganizational cooperation) with an increase in environmental monitoring. This relationship is not derived through precedent, but rather through deduction, the notion being that interorganizational cooperation necessitates interorganizational communication which is in itself a monitoring behavior. Thus the more cooperative links an organization has to other organizations (for instance, the more suppliers and customers a business organization has, or the more intra- and interorganizational councils a government agency belongs to) the more contact it has with its environment on an everyday basis and thus a greater amount of monitoring occurs along with other day-to-day activities.

Finally the last variable thought to increase environmental monitoring is vulnerability to the specific environmental change. This includes physical vulnerability (a threat to the physical well-being of an organization’s property and/or employees), resource vulnerability (a threat to an organization’s normal flow of resources, including raw materials, employees, operating funds, etc.), and demand vulnerability (a threat to the normal demand load of the organization

which can either be a threat that demand will considerably decrease, i.e. business will drop off considerably, or a threat that demand will considerably increase, i.e. requests for products or services will go up substantially). If an organization perceives itself to be vulnerable to any of these types of threats, it is considered to be more likely to closely monitor the situation than an organization which expects to be unaffected by the mass emergency situation.

In terms of our earthquake prediction example then, we are suggesting that certain organizations are likely to investigate the prediction and its possible impact more than are others. These include large organizations, organizations with a great number of cooperative links with other organizations and/or great amounts of interorganizational communication, organizations which have experienced much environmental change in the past, and organizations which are, for any of a number of reasons, especially vulnerable to the environmental change. Organizations which are especially vulnerable to the earthquake prediction for instance, are organizations whose business it is to respond to mass emergency situations (the Red Cross, Federal Disaster Assistance Administration, state-level offices of emergency services and/or disaster planning, and local police and fire departments for example), organizations whose business is likely to severely decrease because of the prediction (construction and real estate firms, for instance), or organizations whose buildings or resources are threatened: (organizations situated close to the fault; organizations dependent on property taxes for revenue). Other organizations, such as nationwide business firms with only a small percentage of their assets in the area, are likely to be less vulnerable to the quake prediction and thus, other things being equal, they will monitor the prediction and its impacts less than the vulnerable organizations just discussed.

DETERMINANTS OF DEFENSIVE RESPONSIVENESS: PROPOSITIONS

The variables relating to defensive responsiveness are shown in Fig. 3. The four most important variables here are the organization's physical vulnerability to the environmental change, the vulnerability of its resource supply, demand decrease (one aspect of demand vulnerability), and flexibility of the organization, which is crucial to defensive responsiveness by being absent, rather than present. As we pointed out earlier, these are four of the crucial explanatory variables which combine in different ways to determine the organizational response to environmental change.

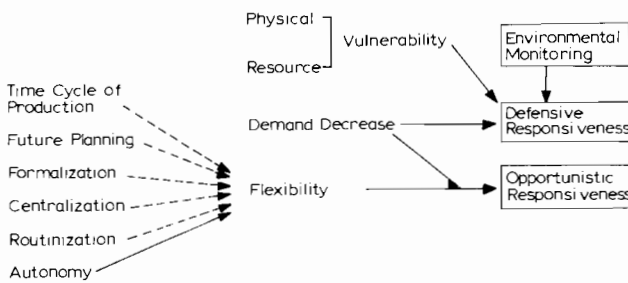


Fig. 3. Determinants of defensive responsiveness: propositions

The first proposition in this group is that physical vulnerability is positively related to defensive responsiveness, or to put it another way, an organization is expected to respond defensively if it is being threatened by an environmental change. In the instance of a credible earthquake prediction for example, an organization which is located on the top floor of a five-story unreinforced masonry building situated atop the San Andreas fault would likely consider either moving completely, relocating temporarily, or closing down during the period of the expected earthquake. Any of these solutions would be considered defensive responses, in that they would be meant to protect the organization from physical harm.

The second proposition states that resource vulnerability is similarly related to defensive response. For instance, city and county governments would probably face a decrease in incoming revenues from taxes in the event of an earthquake prediction. In order to remain solvent, agencies of these governments would have to somehow rearrange their funds, cut budgets, or attempt to get more money from alternative sources to make up the deficit. This also would most likely constitute a defensive response to the prediction (although obtaining more money from an alternative source might be considered an opportunistic response as well).

The third important variable is decreased demand, which also may cause an increase in defensive response. Construction firms, for example, are likely to suffer a severe demand decrease in the event of a credible prediction for a damaging quake, as few people will wish to erect a new building which may then be destroyed when the earthquake occurs. In order for a construction firm to survive such a business downturn (especially if it extends over a long period of time) it will either have to respond defensively (leaving the area, laying off workers, or cutting overhead costs for instance), or alternatively it can respond opportunistically (offering the construction of "earthquake-proof homes," offering building reinforcement services, etc.).

The crucial factor which is thought to determine which of these alternatives an organization will follow is the organization's flexibility; e.g. a flexible organization faced with a demand decrease is expected to respond opportunistically, whereas an inflexible organization in a similar situation is likely to respond defensively. Thus flexibility is crucial to defensive response in its absence, rather than presence, as pointed out before.

Unlike the other crucial variables we discussed, flexibility is an intervening, rather than independent variable, as it essentially is an index of a number of independent factors,

each of which contribute to the level of flexibility of an organization in different ways. For instance, formalization and centralization are both shown to be negatively related to flexibility as several organization theorists (Burns and Stalker, 1961; Hage and Aiken, 1970; Paulsen, 1974) have found them to be negatively related to innovation. Task routinization is a third related variable which is thought to work in much the same way to decrease flexibility. The time cycle of production and the amount of future planning are another two variables which conceptually link together; both tend to increase commitments to future behavior and thus decrease the flexibility of an organization in a secondary way. Finally autonomy is shown to increase flexibility, in that an organization which can make its own decisions is likely to be more flexible than one which is bound by the demands of other external organizations. These independent variables do not always vary together, thus some organizations will be high on some, while at the same time being low on others. It is hoped though, that a combination of these variables will provide a ranking of flexibility which will then combine usefully with the other explanatory variables to determine response.

The final variable which is related to defensive response is environmental monitoring which was discussed as an independent variable on a general level earlier. In addition to the reasoning used then, an additional note can be made here that interorganizational communication, one of the variables which leads to environmental monitoring, has been cited by Terreberry (1968) as correlating with adaptive behavior. Presumably this relationship occurs through the intervening variable of environmental monitoring (i.e. communication increases monitoring, which increases adaptation). Both defensive and opportunistic responsiveness can be considered means of adaptation; thus this theory conforms with Terreberry's in that respect. Mileti and

Gillespie (1976) also suggest that an organization's ability to monitor the environment increases its adaptability which increases the level of organizational change. Thus environmental monitoring may be seen as an intervening variable which, along with other variables, causes an increase in defensive responsiveness and opportunistic responsiveness (organizational activism is treated with a different set of propositions).

DETERMINANTS OF OPPORTUNISTIC RESPONSIVENESS: PROPOSITIONS

Opportunistic response is thought to be generated in one of three ways. It can be caused by a decrease in demand, which will lead to an opportunistic response in flexible organizations (and to a defensive response in inflexible organizations as just discussed), by an increase in demand, which is thought to be a likely cause of opportunism in varying types of organizations, and to a combination of competition and flexibility, which, when the opportunity presents itself (an appropriate environmental change), is thought to encourage opportunistic responsiveness also.

The first relationship between demand decrease and opportunistic responsiveness has already been discussed. Demand increase is thought to cause opportunistic responsiveness simply because it presents such an excellent opportunity for such behavior, for instance, for the expansion of security, autonomy, and/or prestige. A few organizations undoubtedly would reject the opportunity and respond by

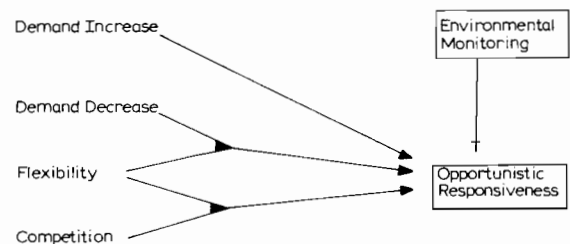


Fig. 4. Determinants of opportunistic responsiveness: propositions

backing away from the increased demand, but more, it is thought, would expand as necessary to fill the enlarged systemic role.

Finally, competition and flexibility are linked together in a manner similar to flexibility and demand decrease. Flexible organizations faced with a competitive environment and a massive environmental change are expected to respond opportunistically when possible to try to increase their competitive advantage. On the other hand, flexible organizations without competitors have no need to take the inherent risks of opportunism, unless, of course, they are threatened otherwise (for instance from decreased demand). Organizations with competitors which are not flexible, on the other hand, may not be able to respond opportunistically even though it would be advantageous to do so. Thus it takes a combination of factors, generally, to cause an opportunistic response to appear as a reaction to an environmental change.

DETERMINANTS OF ORGANIZATIONAL ACTIVISM: PROPOSITIONS

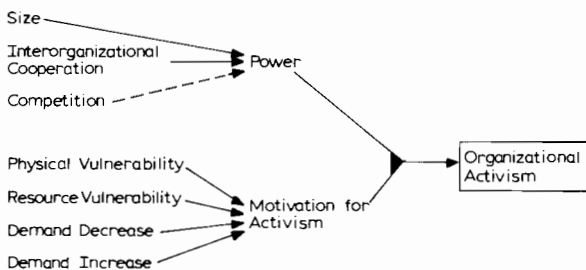


Fig. 5. Determinants of organizational activism: propositions

Two variables are predominant in the causation of organizational activism; these are power and motivation. Power here is being defined as the ability to alter another organization's behavior; thus the environment has power over an organization if it can alter the behavior, or structure (internal behavior in a sense) of that organization; similarly, an organization has power over the environment

if it can alter the behavior of some external organization or other environmental unit (a law, for instance) [5].

Power derives from numerous sources, many of which undoubtedly are not included here. But three variables are thought to be especially important and are included in the theory; these are size, interorganization cooperation and amount of competition (a negative relationship). Size is thought to be related to power simply because larger organizations tend to have more resources at their disposal, more people who are interested in their welfare, (employees and stockholders, for instance) and more people who are in need of their products or services (see Emerson's power-dependence theory, Emerson, 1962). Similarly, competition decreases power since it decreases the population's dependence on one organization for a particular product or service. Lastly, interorganization cooperation is thought to increase power because such cooperation increases the resources that any particular organization can bring to bear on its environment, while at the same time decreasing environmental uncertainty (see Allen, 1974; Turk, 1970; Perrucci and Pilisuk, 1970, among others).

Power is an important variable in this theory because an organization is unlikely to attempt to change its environment (respond activistically) unless it perceives itself to have at least some possibility of success, that is, unless it perceives itself to have some power. While the perception of power and actual power might not always be the same, they are considered similar enough to be lumped into one variable, called "power" for our purposes.

In addition to power, the organization must also have a reason for exercising its power. This reason we are calling motivation for activism and suggest that it is caused by any of the types of vulnerability (physical, resource, or demand vulnerability). For instance, an organization whose physical safety or resources were threatened by an environmental change

might attempt to remedy the situation by changing the environment instead of itself, if it had the power to do so. Faced with an earthquake prediction for example, an organization whose building was threatened might pressure the government to provide free engineering evaluations to assess building safety and perhaps even request money, or more likely, an interest-free loan to strengthen the building if necessary. Or, a government organization whose income was decreased by decreasing tax revenues might lobby at the state legislature to get the ceiling on allowable tax rates to be lifted, so the income lost in "volume" could be made up in "price".

Demand vulnerability can provide motivation for activism also. For instance, in an earthquake prediction situation, demand is likely to drop sharply for real estate and construction firms in the area. To counter this drop they might well attempt public education campaigns aimed at convincing the public that earthquakes are not all that dangerous, that it is not all that likely, or at least clearly not certain, that an earthquake will actually happen, and that, for these reasons, this is an excellent time to buy real estate.

Demand increase too, can create a similar response. For instance, a utility company is likely to receive thousands of calls after an earthquake prediction requesting information and/or evaluations concerning utility safety. A public education campaign run through the media, or with pamphlets mailed with utility bills would bring this stressful situation back under control, while maintaining or even increasing the security and prestige of the organization in the public view.

Any of these above motivation factors, combined with enough power to expect some positive results is thus thought to increase an organization's activist behavior. If either of these factors is missing however, the other response categories are more likely instead.

CONCLUSION

This paper has presented a conceptual scheme for the analysis of organizational response to environmental change which is thought to be somewhat different from most of the related schemes developed previously. Its primary differences are (1) that it discusses organizational adaptation to a quickly changing environment (as opposed to a static or slowly changing environment); (2) it discusses the response processes, not structures, that determine the nature of the organization-environmental field; (3) it addresses a fairly specific question (what determines the level of activism of organizational response to rapid environmental change); and (4) it proposes a specific falsifiable theory to answer the above question.

The values of this approach, it is thought, are three. First of all, the theory provides a framework for the analysis of organization-environment interaction which combines the ideas of two disciplines — organization theory and disaster research, which are areas of study that have been occasionally combined in the past. The result of the combination is a departure from the traditional theoretical patterns to a new pattern which appears to have fairly widespread applicability and usefulness.

Secondly, rather than limiting ourselves to a generalized discussion, we have presented the ideas of the framework in a clearly falsifiable form. Thus they can be tested, not only in our own study using data on the consequences of earthquake prediction, but in other areas of research as well.

Finally, it is also hoped that this framework will be of use to practitioners, specifically organizational decision makers who may face a potential mass emergency situation. Clearly the framework as it now stands is most useful in simply suggesting a way to conceptualize the range of responses available to an organization faced with a major environmental change. By considering all four types of

response in this framework, it is hoped that decision makers will have a better notion of the range of responses that is available to them, and thus help them choose the most appropriate response for their specific situation.

In addition the theory tentatively suggests what types of organizations will respond in what types of ways. Thus it suggests what might be expected of other competitive, or otherwise relevant organizations and indeed what the organizational response is likely to be in the community as a whole. Information of this sort can aid decision makers in their attempts to predict what future environmental changes are likely to occur in response to the initial mass emergency situation, and thus aid in the determination of what response on that particular organization's part is likely to be most appropriate and successful.

NOTES

- 1 For a much more complete review and integration of the organizational literature on organization-environment relations, see Mileti and Gillespie (1976).
- 2 Haas and Drabek (1973) suggest that a continuous struggle for autonomy, security, and prestige underlies all organizational structures and processes.
- 3 Most of the literature which was used as sources of propositions stated the propositions as correlations, not causal relations, as we do here. Thus, few of these propositions have been previously investigated using causal (path) analysis, but rather only using correlational analysis. The specification of cause and effect does seem to make sense in this instance, though, and the propositions are suggested in the form of a causal theory which must yet be verified in this specific theoretical format.
- 4 Vulnerability is determined by so many situation-specific factors that it is treated as an independent variable here. Given a specific mass emergency situation, further variables can certainly be specified which themselves determine vulnerability in that specific instance.
- 5 This is different from the actual utilization of power, which is called organizational activism in this context.

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