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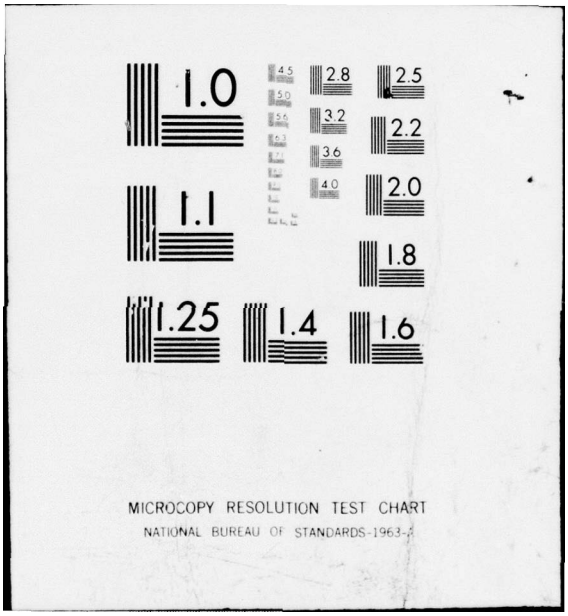
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THE EFFECTS OF DIFFERENT ORGANIZATIONAL ENVIRONMENTS UPON INDIVIDUALS' DECISIONS ABOUT ORGANIZATIONAL DESIGN

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A series of three studies were carried out in which the manipulation of external environments in an experimental setting resulted in subjects choosing organization designs contrary to what would be prescribed by current contingency theory. Implications for the directionality of organization-environment relationships are also discussed.

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Two issues are examined in this paper. One is the notion that environment-organization contingency theories are not only counter-intuitive but in fact require organizational participants to respond in a manner quite opposite to their natural inclinations. The second question addressed is the directionality of "causation" between organization structure and perceived environments.

Much of the Organization Theory literature from the post-human-relations era concentrates on defining which organizational structures, management styles, etc. are most appropriate (effective) for different technologies and/or environmental contingencies. The technology-based works of Woodward (10) and Perrow (8) yielded imperatives for organization structures, given certain technologies. Other pioneers (1, 7, 9) extended the contingency idea to include an environmental perspective. These latter theorists emphasize that organizations must adapt to external forces in order to maintain viability. Thus, many schools of administration are currently engaged in instructing our future leaders that, although many organizational forms are currently in use, the most effective firms tend to use organic styles in turbulent, dynamic environments and tend to use mechanistic styles in more stable, predictable circumstances.

However, many of today's managers and certainly those managers surveyed in the early research works have not been exposed to contingency theory ideas. Obviously some decision makers are able to respond appropriately to turbulent or stable environments without such training, otherwise the original relationships would not have been found. It occurs to us, however, that intuitively, most managers would respond to turbulent environments in a manner opposite to that which is predicted to lead to greater effectiveness. Managers may respond to increased environmental turbulence by an increase in controls and structure,

possibly followed by a relaxation of efforts once the "danger" has passed. Our reasoning is that turbulence causes uncertainty which leads to attempts to reduce that uncertainty. One way to reduce uncertainty is to structure the organizational setting.

So we hypothesized that, contrary to the rational process envisioned by contingency theorists, most managers might react to stable or turbulent environments in a manner quite contrary to that prescribed as most effective. That is, we would expect managers who encounter turbulent and threatening business environments to react by "pulling in the reins," resorting to a mechanistic structure and style in order to gain control over the situation, rather than to face the perceived risks inherent in delegation and "loose" structure. Conversely, we hypothesized that a more stable and supportive environment would result in a manager's "loosening up" into a more organic style.

In addition, we hypothesized that given a stable environment which subsequently becomes turbulent, decision makers would tend to <u>shift</u> from an organic to a mechanistic structure; or, that given a turbulent environment followed by a stable one, decision makers will shift from a mechanistic to an organic structure.

The second issue faces the question of the directionality of environment-organization relationships. As indicated by Huber, O'Connell and Cummings (6), most of the contingency conclusions are drawn from correlation studies, requiring cautious interpretation of causation. So, while field studies such as Duncan's (4, 5) imply causal linkages from organizational environments to perceived environmental uncertainty and from uncertainty to organization structure, there are few experimental studies that show changes in structure

as a result of changes in the environment, and, in fact, Huber et al. (6) found that changes in structure led to changes in perceived environmental uncertainty--the reverse of what is usually predicted. In the following three experimental studies, we examined the effects of different organizational environments upon decisions about organizational structure. Since we experimentally manipulated the perceptions of the external organizational environment we can make some inferences about whether differences in environment actually cause differences in organizational structure.

General Procedure

All three studies used a fairly similar paradigm: An exercise was designed in which descriptions (scenarios) of two organizational environments, one stable and one turbulent, were presented to our experimental subjects. The respondent was instructed to assume the role of President of a newly-created autonomous product division of a large firm, to assess the division's environment (as presented in the scenario), and to "organize his/her division for action" by making some decisions about the organization's structure. All three studies used the same stimulus material; however, the nature of the decision task and the sample population varied between studies.

The development of the scenarios needs to be described in some detail. A two-page description of the firm was developed. Information was given about each of the five external environmental components and factors provided by Duncan (4) as determinants of stability or turbulence. These components are the customers, the suppliers, the competitors, the social-political condition, and the technological requirements. The descriptions of the environment were

identical in all respects except for the words describing each environmental factor. That is, each factor was presented, but their opposite extremes were represented in the two scenarios. For example, the stable firm was described as having inelastic demand and was faced with 10 technological innovations per year (compared to a historical norm of 50 in the industry). The turbulent environment was described as having elastic demand and was faced with 150 technological innovations per year.

The scenarios were pre-tested by asking a sample of doctoral students (from fields other than Administrative Theory) to read one or both of the scenarios and supply an adjective or two to describe them. We used these adjectives to create seven point bipolar scales (sample items: stable-turbulent, Threatening-supportive, controllable-uncontrollable). These items were administered to 24 judges, of whom half were randomly assigned to rate Scenario S (stable) with the remainder assigned to Scenario T (turbulent). The scale scores were summed and a t-test showed the scenarios were judged as significantly different ($t \approx 7$, $p < .001$) in the direction predicted. The stable scenario was seen as significantly more stable, supportive, controllable, etc. than the turbulent scenario. Thus we can feel fairly confident that the experimental stimulus was a valid representation of the two different types of environment that we wished to present.

Study 1

Decision Task

An instrument for assessing organization structure decisions was designed by operationalizing various organic-mechanistic descriptions from the Burns

and Stalker study (1). Five-point, Likert-type scales were used to measure responses to seven items describing the organization's structure. The scale items included:

(1) Very few written rules vs. Policy manual with clear rules.

(2) Copies of all communication between managers are sent to you vs. Almost no written communication.

(3) Lower-level employees communicate through channels vs. All employees are free to communicate across organizational lines at any time.

(4) Lower level employees are free to use their own initiative vs. All orders come from you.

(5) Each managerial level is distinctly superior to the next level vs. Managers and followers have only slight rank differences.

(6) Jobs are clearly distinct and duties should not cross departmental lines vs. Jobs are not clearly specified and may be performed by many departments.

(7) A flat, wide organization structure vs. a tall, narrow organization structure.

A sum of these seven items is used as our overall estimate of the degree to which a mechanistic or organic structure was preferred.

Subjects

The participants were 47 college students enrolled in two Organization Behavior classes at the University of Washington, most of whom were Business Administration juniors and seniors. There was no control over whether they had had previous exposure to Contingency Theories (taught in a separate Organizational Theory course).

Procedure

Half the subjects were assigned randomly to scenario S and half to T, after which they were asked to respond to the organization structure instrument. The exercise was then re-run with the scenarios switched. The materials were completed in class.

Results

The various analyses examined mean response scores (higher scores indicate a more mechanistic orientation, lower scores more organic) on our organization structure items. The first comparison was between aggregate scores on Scenarios S and T (i.e., total mean scores for each scenario whether administered first or last); this comparison tested our hypothesis that turbulent environments would yield higher mechanistic scores than stable ones. The second and third comparisons tested means between receiving S first and T second, and vice-versa; these tested for shifts in organization style in response to environmental shifts. The results of the t-tests are shown in Table 1.

Insert Table 1 about here

The data support the hypothesis that stable environments yield significantly less "mechanistic" (or more "organic") scores than turbulent environments (Test No. 1). Our hypothesis that Stable-to-Turbulent changes will yield a shift from organic to mechanistic styles was also supported (Test No. 2). Our third hypothesis was not supported; i.e., Turbulent-to-Stable environmental changes did not result in a "loosening up" of structure (Test No. 3).

Table 1

The Differences in Organization Structure Scores as a Result of the Manipulation of Environment: Study 1

	Stable $(\bar{X})^a$	Turbulent $(\bar{X})^a$	n	t
1. $S_{1,2}$ vs. $T_{1,2}{}^b$	14.2	16.9	46	2.40**
2. $S_1 \rightarrow T_2$	14.3	18.0	25	2.15*
3. $T_1 \rightarrow S_2$	16.0	14.1	21	1.89

*$p < .05$

**$p < .01$

[a]Higher scores indicate a more "mechanistic" response. The possible range on this scale was 7 to 35.

[b]Subscript refers to order of presentation. Thus: "S_1" indicates that the Stable environment was perceived first, then responded to; "$S_{1,2}$" indicates the aggregate score of responses to Stable, whether received before or after Turbulent; and $S_1 \rightarrow T_2$ indicates that after responding to the Stable environment, the Turbulent environment was administered to the respondents.

Study 2

Decision Task

The organization structure items from the first study were refined and expanded to ten items, each with a seven-point scale. The three new items were: (1) decision authority based on expertise vs. decision authority based on managerial position, (2) emphasis on accomplishing the task vs. emphasis on maintaining integrity of the system, and (3) major strategic decisions to be made by the president vs. major strategic decisions to be made by a representative group. A manipulation check was also added by including two items asking respondents to indicate how they perceived the environment described in each situation presented (e.g., ranging from "certain" to "uncertain" and "predictable" to "unpredictable" on seven-point scales). A sum of these two items served as the manipulation check.

Subjects

The participants were 49 junior and senior Business Administration students enrolled in two Organization Theory classes at the University of Washington. The main distinction between this sample and that of Study 1 was that these students had no prior exposure to contingency thoery. The Organization Theory course provides students with their first exposure to contingency theory and the experiment was conducted early in the quarter before the presentation of this material.

Procedure

The procedure was identical to that in Study 1, except that (1) the test was administered near the beginning of the quarter, and (2) the extended organization structure items and the manipulation check were included.

Results

The first data to observe, the manipulation check items, are presented in Table 2. One can see that both in aggregate and in terms of changes determined by the order of presentation the stable scenario was judged as significantly more stable than the turbulent scenario. We can feel fairly confident that the subjects perceived the scenarios in the manner we intended.

The same analyses were run as in the first study. As in Study 1, the data support the hypothesis that Stable-to-Turbulent environmental changes will result in a "mechanistic shift" (Test No. 2). However, the aggregate differences in structure scores between Scenarios S and T were not significant (Test No. 1). Finally, and as in Study 1, no "loosening up" was found in the change from Turbulence to Stability (Test No. 3).

Insert Table 2 about here

Study 3

Decision Task

To increase the realism of the task, an in-basket exercise was constructed in which each of the ten organizational structure dimensions from the instrument used in Study 2 was developed into a one-page decision problem. After reading either the turbulent or stable scenario each subject received 10 items describing some behavioral incident that occurred within the firm. For example, one item had a manager requesting information about how clearly rules and procedures should be written up and distributed. The subjects' task for each decision problem involved reading the one-page incident and choosing an organic or mechanistic structure on a four-point multiple-choice scale. In

Table 2

The Differences in Organization Structure Scores as a Result of the Manipulation of Environment: Study 2

	Organization Structure[a]				Manipulation Check[b]			
	Stable ($\bar{X}$)	Turbulent ($\bar{X}$)	n	t	Stable ($\bar{X}$)	Turbulent ($\bar{X}$)	n	t
1. $S_{1,2}$ vs. $T_{1,2}$	41.8	41.4	48	.24	4.9	10.5	48	8.57***
2. $S_1 \rightarrow T_2$	42.8	45.9	22	1.63*	6.6	10.4	22	3.60***
3. $T_1 \rightarrow S_2$	41.0	37.8	26	1.27	3.4	10.6	26	9.86***

*p < .05

**p < .01

***p < .001

[a]Higher scores indicate more "mechanistic" response. The possible range on this scale was 10 to 70.

[b]Higher scores indicate perception of greater uncertainty. Possible range of scores was 2 to 14.

contrast to the questionnaires used in the first two studies, which required about 15 minutes to answer, the in-basket activity required about one hour to complete. Again, a sum of the 10 scales was used as the criterion.

Subjects

The participants were 43 practicing managers from the Seattle metropolitan area who were enrolled in an off-campus evening MBA program. While this sample provides more "external validity" to our findings it was impossible to control for their previous exposure to contingency ideas.

Procedure

Due to the complexity of the in-basket task and the time involved to perform it, the subjects were not asked to "shift" scenarios. Therefore, this study was used primarily to test initial reactions of managers to either a stable or a turbulent environment. Half the subjects were assigned randomly to S and half to T without either group's knowledge that there existed more than one version of the scenario.

Results

The hypothesis that managers would respond "mechanistically" in a turbulent environment and "organically" in a stable one was supported by the data. The mean score for the turbulent scenario was 27.0 and for the stable scenario it was 25.4. This difference is significant ($t = 1.65$, $p < .05$) and in the direction predicted.

Discussion and Conclusion

It was hypothesized that environmental states (stability and turbulence) would influence decision makers' organization design choices in a manner

contrary to that prescribed by current contingency theory. More specifically, we predicted that individuals would respond "organically" in a stable environment and "mechanistically" in a turbulent one. In addition, we predicted that responses would "shift" from organic to mechanistic when stable environments were replaced by turbulent ones and, conversely, would "loosen up" when turbulence was followed by stability.

The three studies reported here support the first two hypotheses, but not the third. That is, individuals did, in general, respond more organically to stable and more mechanistically to turbulent environments; they did shift to a more mechanistic mode when turbulence followed stability; but they did not shift to a more organic mode when the environment became more stable. The support for our first hypothesis was strengthened considerably in our third study where practicing managers, performing a more complex task, confirmed the response inclinations found among our first two samples of college students.

The lack of support for our third hypothesis might be explained by man's quest for the reduction of uncertainty (9). That is, mechanistic organizations place control of the organization in the hands of the chief administrator, and control over information and organizational activities reduces the administrator's uncertainty. Thus, our subjects generally responded by wishing to increase control over a changing situation, regardless of whether this change was from turbulent to stable or the reverse.

The support for our first two hypotheses raises an interesting issue with regard to the directionality of causation. Considering the present study and Huber et al.'s (6) together, there is a compelling argument for reciprocal causation between environmental uncertainty and organization structure. An interesting question for future research would be concerned with discovering

the degree to which uncertainty causes structural changes as opposed to structural differences causing uncertainty.

While these studies tapped individuals' predispositions to act rather than tapping actual structuring behavior, they pose an interesting question to contingency theorists. If, in fact, managers tend to prefer mechanistic modes of organizing in conditions of environmental turbulence and uncertainty and, in fact, become more disposed in this direction as the environment increases in turbulence, what role should administrative scientists play in attempting to improve the effective performance of organizations? We can suggest two possibilities. First, increasing attention should be paid to facilitating management's ability to enact "organic" states at appropriate times. This theme is developed in Dewar and Duncan's (3) discussions of using organic modes for "brainstorming" for innovation and shifting back to a mechanistic mode for implementation. This suggestion contrasts with the usual OD approach of advocating longer lasting organic behavioral modes which might run contrary to managerial predisposition.

The other possibility is for contingency theorists to recognize the role of managerial choice in not seeking a "goodness of fit" between organizations and their environments (2). That is, once a certain minimum level of organizational performance has been achieved, managerial values and inclinations may indicate a stronger imperative to organize in a particular way than would be indicated by either technological or environmental contingencies. We must somehow deal with these "irrational" decisions in our future explanations of the relationship between organizational environments and structures.

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Footnote

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