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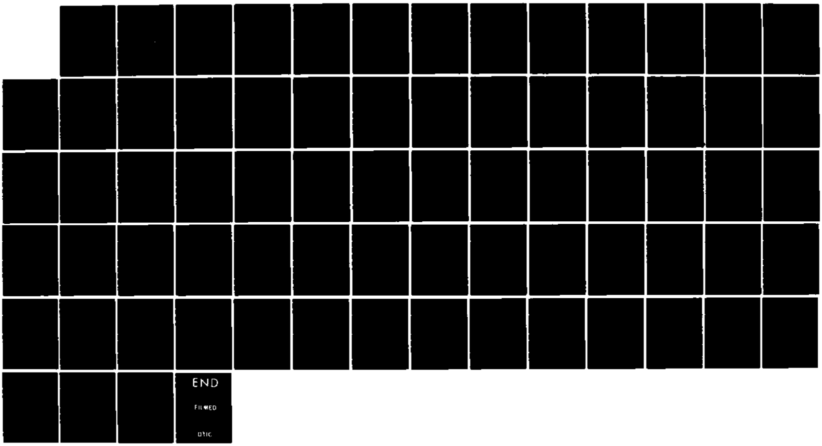

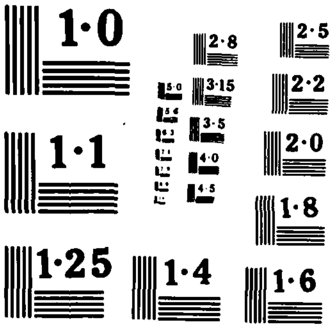
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AN EXAMINATION OF ALTERNATIVE FORMS OF FIT IN CONINGENCY THEORY

by

Robert Drazin

and

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THE STRATEGIC MANAGEMENT RESEARCH CENTER

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Robert Drazin is Assistant Professor in the Graduate School of Business at Columbia University. Andrew H. Van de Ven is 3M Professor of Human Systems Management in the Strategic Management and Organizational Department of the School of Management at the University of Minnesota, and is also the director of the Strategic Management Research Center.

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Contingency theories dominate scholarly studies of organization behavior, performance, planning, and management strategy. While varying widely in subject matter, they have at their core the common proposition that organizational performance results from the fit of context with design. "Fit" is the key concept in any contingency theory. This paper presents three concepts of fit: selection, interaction and systems approaches. These approaches are empirically compared using a contingency theory of work unit design. (over)

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AN EXAMINATION OF ALTERNATIVE FORMS OF FIT IN CONTINGENCY THEORY

ABSTRACT

Contingency theories dominate scholarly studies of organization behavior, performance, planning, and management strategy. While varying widely in subject matter, they have at their core the common proposition that organizational performance results from the fit of context with design. "Fit" is the key concept in any contingency theory. This paper presents three concepts of fit: selection, interaction and systems approaches. These approaches are empirically compared using a contingency theory of work unit design. Implications for using multiple types of fit in contingency studies in general and for work unit level studies in particular are presented.

AN EXAMINATION OF ALTERNATIVE FORMS OF FIT IN CONTINGENCY THEORY

Contingency theory has dominated our practical and theoretical models of the functioning of organizations for nearly two decades. Its basic proposition is that organizational performance is a consequence of a "fit" between environment and internal organizational arrangements. Despite the prominence of this general proposition in the organizational behavior and strategic management literatures, scholars have become increasingly concerned with standard formulations of contingency theory and the apparent inability of this theory to bear fruit empirically (Pennings, 1975; Mohr, 1982; Tosi and Slocum, 1984; Van de Ven and Drazin, 1985). Our confidence and belief in contingency theory appears to go beyond the data we have been offered to date (Schoonhoven, 1981).

Much of the problem with contingency theory is a confusion over the concept of fit that underlies all contingency models. Despite the critical role of "fit," few scholars have seriously examined its implications when developing and testing specific contingency theories (Schoonhoven, 1981; Tosi and Slocum, 1984: Van de Ven and Drazin, 1985). Instead, it appears that concepts of fit are drawn from the large, implicit pool of domain assumptions and methodological conventions that represent the current state-of-the-art of organizational theory. We believe, following Alexander (1964), that "fit" is the essence of design and as such deserves much more careful development if advances in our understanding of contingency theory are to occur.

Recently some attention has been devoted to this issue, primarily through the formulation of alternative definitions and methods of testing for fit. Researchers have proposed and tested a variety of conceptualizations of fit that vary from standard formulations (Schoonhoven, 1981; Dewar and Werbel, 1979; Ferry, 1979; Joyce, Slocum and Von Glinow, 1983; Van de Ven and Drazin, 1985).

While independent efforts to develop and refine the concept of fit are to be applauded, problems result when findings representing only one approach are presented. Using a single approach for modelling fit prevents one from assessing the relative strengths and weaknesses of that approach versus others in terms of which approaches better model congruency in different populations, at different levels of analysis, or with different variables. An empirical understanding of the concept of fit will not likely develop until comparative studies are conducted that assess multiple versions of fit in a single data base. Complex, richer approaches to the analysis of fit will avoid the problems associated with earlier studies.

This paper presents just such a comparative approach by using three basic forms of fit to assess a task contingent theory of work unit design. First, the three approaches to the concept of fit are briefly introduced and discussed, followed by a presentation of the task contingent theory of work unit design. Data are then presented to examine each version of fit. Conclusions will be drawn regarding the nature and meaning of fit for contingency theories of organizational design.

SELECTION, INTERACTION AND SYSTEMS APPROACHES TO FIT

Van de Ven and Drazin (1985) point out that in the historical evolution of structural contingency theory, at least three different conceptual meanings of fit or congruency have emerged. These three approaches are termed Selection, Interaction and Systems; and are illustrated in figure 1. Only the basic elements of each approach are reviewed here with further development provided in Van de Ven and Drazin (1985).

----Insert figure 1 about here----

The Selection Approach to Fit

In the early development of structural theories of organization the concept of context as a causal agent of structure became firmly entrenched. Organizational context, whether technology, environment, or size was hypothesized to cause organization design, based on the premise that effective organizations adopt structures that fit their situations better than those that are not effective. The concept of fit here is viewed as an unquestioned axiom, an assumption that allows structural researchers to investigate context-structure linkages and not to be concerned with a direct assessment of performance.

This concept of fit has been developed recently using a natural selection argument. Borrowing from the considerable literature in biology on form-context relationships, researchers have argued that fit is the result of an evolutionary process of adaptation that ensures that only the best performing organizations survive (Hannan and Freeman, 1977; Aldrich, 1979; Comstock and Schroger, 1979; McKelvey, 1982). An equilibrium between environment and organization is assumed to exist, at

Figure 1. Alternative Interpretation of "Fit" in the Evaluation of Structural Contingency Theory

	SELECTION APPROACH	INTERACTION APPROACH	SYSTEMS APPROACH
INITIAL VIEWS	Assumption	Bivariate Interaction	Consistency Analysis
—Definition	Fit is an assumed premise underlying causal organization context-structure models.	Fit is the interaction of pairs of organizational context-structure factors on performance.	Fit is the internal consistency of multiple contingencies, structural, and performance characteristics.
—Test Methods	Correlation or regression coefficients of context (e.g., environment, technology or size) on structure (e.g., configuration, formalization, centralization) should be significant.	Context-structure interaction terms in MANOVA or regression equations on performance should be significant.	Deviations from ideal type designs should result in lower performance. The source of the deviation (in consistency) originates in conflicting contingencies.
CURRENT-FUTURE VIEWS	Macro Selection	Residual Analysis	Equifinality
—Definition	Fit at micro level is by natural or managerial selection at macro level of organizations.	Fit is conformance to a linear relationship of context and design. Low performance is the result of deviations from this relationship.	Fit is a feasible set of equally effective, internally consistent patterns of organization context and structure.
—Test Methods	Variables subject to universal switching rules should be highly correlated with context. Particularistic variables should exhibit lower correlations.	Residuals of context-structure relations regressed on peformance should be significant.	Relationship among latent context, structure and performance constructs should be significant, while observed manifest characteristics need not be.

least over longer periods of time, and only context-structure relationships need to be examined to assess fit (see Fennel, 1980, as an example). This is because an identity, or isomorphic relationship between context and structure, is presumed to exist for the surviving organizations (Hannan and Freeman, 1984).

A managerial view of this selection approach is relevant when one examines multiple levels of organizations. No matter what organizational level is examined, a more macro level exists which imposes, at least in part, uniform practices and prescriptions upon the more micro level (Astley and Van de Ven, 1983). Government laws regulate industries, institutional and professional codes and conventions regulate professional practice and macro levels of organizations impose policies and rules on divisions, departments and subunits (Meyer and Rowan, 1977; Fennel, 1980; DiMaggio and Powell, 1983).

At some macro-level, in other words, organization-wide switching rules are set that prescribe structural configurations suited for certain types of subunit tasks. For example, most organizations have rules that govern a variety of subunit level design characteristics, including; standard operating procedures, job descriptions, reward sytems and staffing requirements. Other design parameters, especially those associated with subunit processes (including coordination mechanisms, leadership style, and communication), are not as easily subject to macro-level design and control, are more particularistic in nature, and are usually left to the control of the subunit itself.

The consequence of these macro-micro distinctions is that one should expect organization-wide design parameters to vary more strongly with context than would the particular variables controlled by the unit.

Also, because there is little variation within types of subunits on the design factors that are prescribed by the corporate level, they should not be expected to interact with context to explain differences in the performance of those subunits. Only the design factors within the control of subunits should vary enough between subunits to enable interactions to be detected.

The Interaction Approach to Fit

A second interpretation of fit is that it is an interaction effect of an organization's context and structure on performance - much like the classic studies of the interaction of sun, rain and soil nutrients on crop yields. The interest here is not so much in understanding the causal relationship between context and structure (the selection approach), but rather in understanding how variations in structure under particular conditions of context effect performance (Van de Ven, 1979).

Overall, mixed results have been obtained for this common and popular approach to fit. Correlational studies have found that the relationships between structure and context are stronger for high-performing organizations than for low-performing organizations, but often the results are small and insignificant (Khandwalla, 1974; Negandi and Reimann, 1972; Child, 1974; Van de Ven and Ferry, 1980). Mohr (1971), Pennings (1975) and Tushman (1977, 1978, 1979) tested for interaction effects, and only the Tushman studies provided some support for the interaction hypothesis.

For those who take an interaction view of fit in contingency theory these results are difficult to accept. In part, these findings can be explained by the difficulties facing researchers attempting to model interactions in field survey data bases. Correlations among structure and context make it difficult to decompose and assess the effects of interactions versus intercorrelations (Green, 1977). Due to selection pressures a restricted range of structural variation exists within each level of context. Although the total sample may exhibit a range of variation on context and structural dimensions, the non-independent relation of structure and context may limit certain combinations from occurring. A true test of interaction, defined as a difference in the relationship between two variables based on the level of a third, may not yield significant results due to these difficulties (J. Miller, 1981).

Further problems result from procedures that dichotomize or polychotomize variables that have been measured on a continuous basis for the purpose of creating ANOVA classes (Pierce, et al, 1979). 'tiplicative interaction terms in regression analysis limit the form of the interaction to only one finite variety (Green, 1977; Schoonhoven, 1981). In addition, multiplicative interactions are usually correlated with the variables from which they are developed, causing multi-collinearity problems in the analysis (Green, 1977; Schoonhoven, 1981). Finally, significant interaction terms may result solely from the scale of measurement of the dependent variable. Monotonic or logarithmic transformations of the dependent variable have been shown to reduce the effect of the interaction to insignificant levels (Green, 1977).

As a result of the frustrations associated with implementing an interaction approach several researchers have extended this type of thinking to a new form of fit analysis: the <u>deviation score approach</u>. Rather than testing for classical interaction effects, proponents of

TABLE 2 CORRELATIONS AMONG UNIT CONTEXT, STRUCTURE, PROCESS AND PERFORMANCE VARIABLES FOR 629 EMPLOYMENT SECURITY WORK UNITS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	14a	14b	15
UNIT CONTEXT																	
1. Task Uncertainty	1.000																
2. Office Size	.055	1.000															
3. Unit Size	-.088	.011	1.000														
4. Administrative Intensity (% SPU's name 1st level)	-.033	.439[3]	.020	1.000													
5. # Levels Unit From Top	-.275[3]	.362[3]	.040	.221[3]	1.000												
UNIT STRUCTURE																	
6. Unit Specialization *	.121[2]	-.012	-.113[1]	-.016	-.178[3]	1.000											
7. Unit Standardization *	-.468[3]	-.357[3]	.085	-.122	.351[3]	-.188[3]	1.000										
8. Personnel Expertise *	.467[3]	.010	-.120	-.062	-.190[3]	-.096[1]	-.248	1.000									
9. Supervisory Discretion	-.096[1]	-.027	.067	-.043	.074	-.087[1]	.186[3]	-.063	1.000								
10. Employee Discretion	.194[3]	-.042	-.117[2]	-.123	-.295[3]	.157[1]	-.162[3]	.072	.335[3]	1.000							
UNIT PROCESS																	
11. Written Communication *	.300[3]	.064	.079	-.123[1]	-.029	.095[1]	-.078	.215[3]	.097[1]	.079	1.000						
12. Verbal Communication	.334[3]	-.203[3]	-.047	-.128[1]	.219[3]	-.129[2]	.011	.291[3]	.021	.069	.315[3]	1.000					
13. Frequency of Conflict	.135[2]	-.073	.174[3]	-.023	-.158[2]	.058	-.099[1]	.050	.074	.039	-.004	.037	1.000				
14. Conflict Resolution by:																	
a. Avoidance and Smoothing	-.033	-.034	.099[1]	.022	-.029	-.043	-.017	.000	.041	.095[1]	-.081	-.029	.442[3]	1.000			
b. Confrontation	.057	-.045	-.132[2]	-.127[1]	-.004	-.008	-.024	-.004	-.027	.116	.089[1]	.162[3]	-.293[3]	-.436[3]	1.000		
c. Authority	-.080	.006	.047	-.072	.115[1]	-.017	-.086[1]	-.162	.080	-.052	.036	.071	-.065	-.110	.348[3]	1.000	
UNIT PERFORMANCE																	
15. Unit Efficiency	-.023	-.243[2]	.095	-.206[3]	-.113	.007	.013	.038	-.021	.113	.047	.117	-.071	-.118	.065	.064	1.000
16. Job Satisfaction	-.043	-.137[1]	.011	-.361[3]	.062	.051	.181[2]	-.021	.038	.089[1]	.006	.120[2]	-.305[3]	-.286[3]	.339[3]	.297[3]	.214[2]

* Design characteristics prescribed at the macro-organization level for types of subunits.

1 = $p < .05$
2 = $p < .01$
3 = $p < .001$

hypothesized to be subject to macro-organizational switching rules are designated with an asterisk.

----Insert Table 2 about here----

First, Table 2 shows substantial support for the overall hypothesis in the OA task contingency theory that task uncertainty has larger and more significant correlations with unit design characteristics than with other contextual factors. However, office and unit size, the number of levels the unit is removed from top management, and administrative intensity are also related to unit design. In particular, a unit's size and the number of levels it is removed from the top have a number of significant effects on unit process dimensions. Many of these effects are in the opposite direction of the effect of task uncertainty.

A review of the correlations in the first column of Table 2 provides evidence to compare the natural selection and managerial selection hypotheses. Task uncertainty is significantly correlated with all the unit design characteristics except for the three styles of conflict resolution (which had small but significant correlations with other contextual factors). These findings support the natural selection hypothesis.

However, Table 2 shows large differences in the sizes of the correlations. Three of the four dimensions hypothesized in the managerial selection model as subject to macro-organizational switching rules are strongly correlated with task uncertainty (unit standardization, personnel expertise, and written communications). While significant, unit specialization has a substantially lower

This hypothesis varies depending upon whether one subscribes to the natural selection or managerial selection view. For the natural selection view, task uncertainty is expected to be strongly related to all dimensions of unit structure and process. However, managerial selection assumes that part-whole relationships exist between work units and the larger organizations in which they are embedded. In particular, switching rules on the prescribed design of different types of subunits are expected to result in strong correlations between task uncertainty and those unit design characteristics that are programmed at the macro-organizational level. In this study these characteristics are unit specialization, standardization, expertise, and written communications.

Corporate personnel departments usually designate and control the degrees of personnel expertise and specialization through organization-wide job descriptions and civil service selection procedures for various job classifications. Work standardization and work codification are often programmed by the technological work subsystems in which organizational units are embedded and are monitored by the staff units at the state level responsible for developing and maintaining these subsystems in the organization. However, other characteristics, such as verbal communications, conflict, styles of conflict resolution, and employee and supervisor discretion, are less capable of being programmed at a macro-organizational level, and will therefore reflect the particularistic style of unit personnel.

<u>Natural and Managerial Selection Results</u>

Table 2 presents a correlation matrix among the unit context, design, and performance variables. The design characteristics

TABLE 1 MEANS AND STANDARD DEVIATIONS FOR LOW, MEDIUM AND HIGH TASK UNCERTAINTY UNITS ON 11 STRUCTURE AND PROCESS DIMENSIONS

	Low Task Uncertainty Units		Medium Task Uncertainty Units		High Task Uncertainty Units	
	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD
UNIT STRUCTURE						
Unit Specialization	5.89	.946	5.80	.806	6.07	.861
Unit Standardization	3.72	.670	3.55	.551	3.02	.693
Personnel Expertise	2.96	.632	3.33	.669	3.84	.712
Supervisory Discretion	3.00	.675	2.99	.559	2.91	.545
Employee Discretion	3.42	.760	3.50	.637	3.69	.621
UNIT PROCESSES						
Written Communication	1.52	.528	1.73	.522	1.94	.533
Verbal Communication	2.44	.644	2.80	.649	2.98	.714
Frequency of Conflict	1.98	.815	2.14	.871	2.18	.748
Conflict Resolution by:						
a. Avoidance and Smoothing	2.25	.766	2.34	.779	2.26	.681
b. Confrontation	3.32	1.030	3.32	.921	3.48	.821
c. Authority	2.80	.923	2.69	.832	2.69	.834

and Wisconsin in 1975 and 1978. These units administer the Department of Labor's Job Services, Unemployment Insurance, Workman's Compensation, and Work Incentive programs at the local community level.

With the exception of unit efficiency, all the dimensions in Figure 4 were measured with the Organization Assessment Instrument (OAI), as developed and evaluated by Van de Ven and Ferry (1980). Questionnaires were completed by all unit members and supervisors during business hours after an OA research team member explained the purpose and use of the study. The data reported here are at the unit level and were the result of an aggregation procedure which gave equal weight to the responses of the unit supervisor and the average of all responses of the unit personnel reporting to the supervisor. Measures of efficiency were obtained from organizational performance records for each unit and consist of the amount of output produced per full-time equivalent position. In addition, measures of unit size, office size, adminstrative intensity, and unit levels were obtained from organizational charts developed for each community office. Means and standard deviations for all variables are shown in Table 1.

----Insert table 1 about here----

<u>Natural and Managerial Selection Approach</u>

With a natural selection approach to fit, the basic hypothesis in the OA task contingency theory is that task uncertainty (or task difficulty and variability) is the strongest predictor of work unit design relative to other contextual factors. Performance is notably absent in this hypothesis; the selection approach simply assumes that structural form must be adaptive to the environment or the organizational unit is selected out of existence.

Figure 4. Hypotheses in Task Contingent Model of Work Unit Design

Task Contingent Factor			
Task Uncertainty (Difficulty and Variability)	If Low	If Medium	If High
	↓	↓	↓
Unit Structure	**Systematized**	**Discretionary**	**Developmental**
1. Unit Specialization	High	Medium	Low
2. Unit Standardization	High	Medium	Low
3. Personnel Expertise	Low	Medium	High
4. Supervisory Discretion	High	Medium	Low
5. Employee Discretion	Low	Medium	High
Unit Processes			
6. Verbal Communication	Low	Medium	High
7. Written Communication	Low	Medium	High
8. Frequency of Conflict	Low	Medium	High
9. Conflict Resolution By:			
a. Avoidance & Smoothing	High	Medium	Low
b. Authority	High	Medium	Low
c. Confrontation	Low	Medium	High
	↓	↓	↓
Performance (With Above Pattern)		Will Result In	
Job Satisfaction	High	High	High
Unit Efficiency	High	High	High
Performance (With A Different Pattern)			
Job Satisfaction	Low	Low	Low
Unit Efficiency	Low	Low	Low

Source: Van de Ven, 1976a.

OA task contingency theory proposes that high-performing units which undertake work at low, medium, and high levels of difficulty and variability will adopt, respectively, systematized, discretionary, and developmental programs or modes of structure. *Figure 4 shows the* underlying structure and process dimensions that distinguish among these three programs. Programs are the way repetitive activities are organized (March and Simon, 1958).

The structural elements of these programs are defined in terms of: (1) specialization, the number of different work activities performed by a unit; (2) standardization, the procedures and pacing rules that are followed in task performance; (3) discretion, the amount of work-related decision making that the supervisor and employees exercise; and (4) personnel expertise, the skills required of personnel to operate the program. Process is defined as the coordination pattern among unit personnel who execute the work program. Coordination is indicated by of the frequency of verbal and written communication, as well as the frequency of conflict and the methods used to resolve that conflict among unit personnel.

Unit efficiency (output per person) and the average level of job satisfaction of unit personnel are hypothesized in this model to be a function of the fit between the level of task uncertainty faced by the unit and its internal pattern of structure and process.

----Insert figure 4 about here----

<u>Sample and Measurement Procedures</u>

Data to test this contingency theory were obtained from 629 employment security units in 60 offices located throughout California

EMPIRICAL TESTS OF THE SELECTION, INTERACTION AND SYSTEMS APPROACHES TO FIT

In this section the three approaches to fit presented above are examined within the context of a task contingent theory of work unit design and an associated data base collected to test that theory. The main advantage of analyzing these various forms of fit using a common data base is that one can compare unique and complimentary information on the selection, interaction and systems approaches to fit in one contingency theory. Moreover, an examination of these multiple forms of fit provides a more robust understanding of contingency analysis than would be available by using only one alternative of fit.

The Task Contingent Model of Work Unit Design

We will now compare the three approaches to fit by examining the task contingent model of work unit design developed by Van de Ven and associates (Van de Ven and Delbecq, 1974; Van de Ven, Delbecq and Koenig, 1976; Van de Ven, 1976a, 1976b; Van de Ven and Drazin, 1978). This model has been extended and incorporated as a core part of the larger Organizational Assessment (OA) framework and instruments (Van de Ven and Ferry, 1980; Ferry, 1983). The OA research program aims to develop a conceptual framework and related measurement instruments for assessing the performance of jobs, work groups, inter-unit relationships, and organizations on the basis of how they are organized and the environments in which they operate. At the heart of the OA research effort is a contingency theory of job, work unit, and organizational design. Here we focus specifically on the OA task contingent theory of work unit design. By definition, the work unit is the smallest collective group in the organization and consists of a supervisor and all personnel who report directly to that supervisor.

of performance. The performance ordering around ideal type I would therefore be B, A, C. The performance ordering around ideal type II would be F, E, D. For higher dimensionalities the performance contours would be represented as spheres and hyperspheres (Caroll and Chang, 1970).

A three step procedure can be used to test this pattern approach to fit. First, ideal type patterns of design scores can be generated either theoretically or empirically (Ferry, 1979). Second, distances from actual organizations to their respective ideal types are calculated according to the following eucledian distance formula:

$$DISTij = \sqrt{\sum_{S=1}^{N} (X_{is} - X_{js})^2}$$

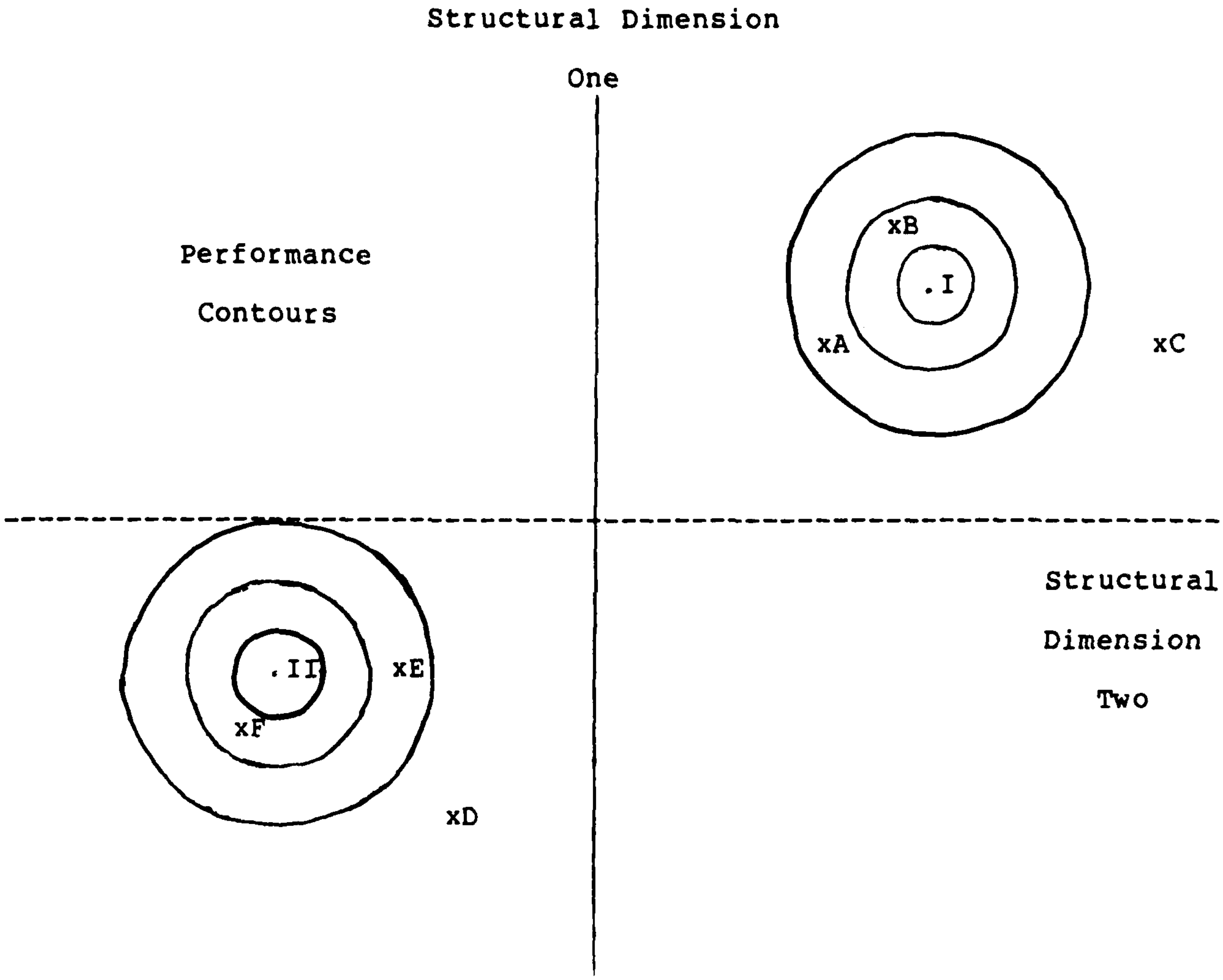
where DISTij = eucledian distance from the jth focal organization to its ideal type I, and,

Xis = score of the ideal type organization on the sth structural dimension, and,

Xjs = score of the jth unit on the sth structural dimension.

The final step actually tests the contingency theory by correlating the derived distance measure with organizational performance. Lack of fit or "misfit" is demonstrated if the derived distance measure is significantly and negatively correlated with performance.

FIGURE 3: A Geometric Representation Of Pattern Analysis



configurations.

A pattern analysis approach to fit recognizes that such gestalts are important for understanding performance. As opposed to the interaction forms of fit this approach focuses on the multivariate nature of design. It is hypothesized that departures from an "ideal pattern" of structure and process for a particular context will result in lower performance. This departure can occur for any or several of the design elements and still effect performance.

This approach to fit is shown geometrically in figure 3. For purposes of illustration, only two ideal types and two underlying dimensions of structure are shown, in recognition of the fact that the principle involved can be easily extended to multiple modes or higher dimensionalities. One ideal type (I) is shown in the upper right quadrant, and a second ideal type (II) is shown in the lower left quadrant. Each is presumed to represent an ideal pattern of scores for a given level of context. Several hypothetical organizations can be plotted according to their structural scores. Organizations A, B, and C are plotted around their respective ideal type number I, while organizations D, E, and F are plotted around their respective ideal type number II.

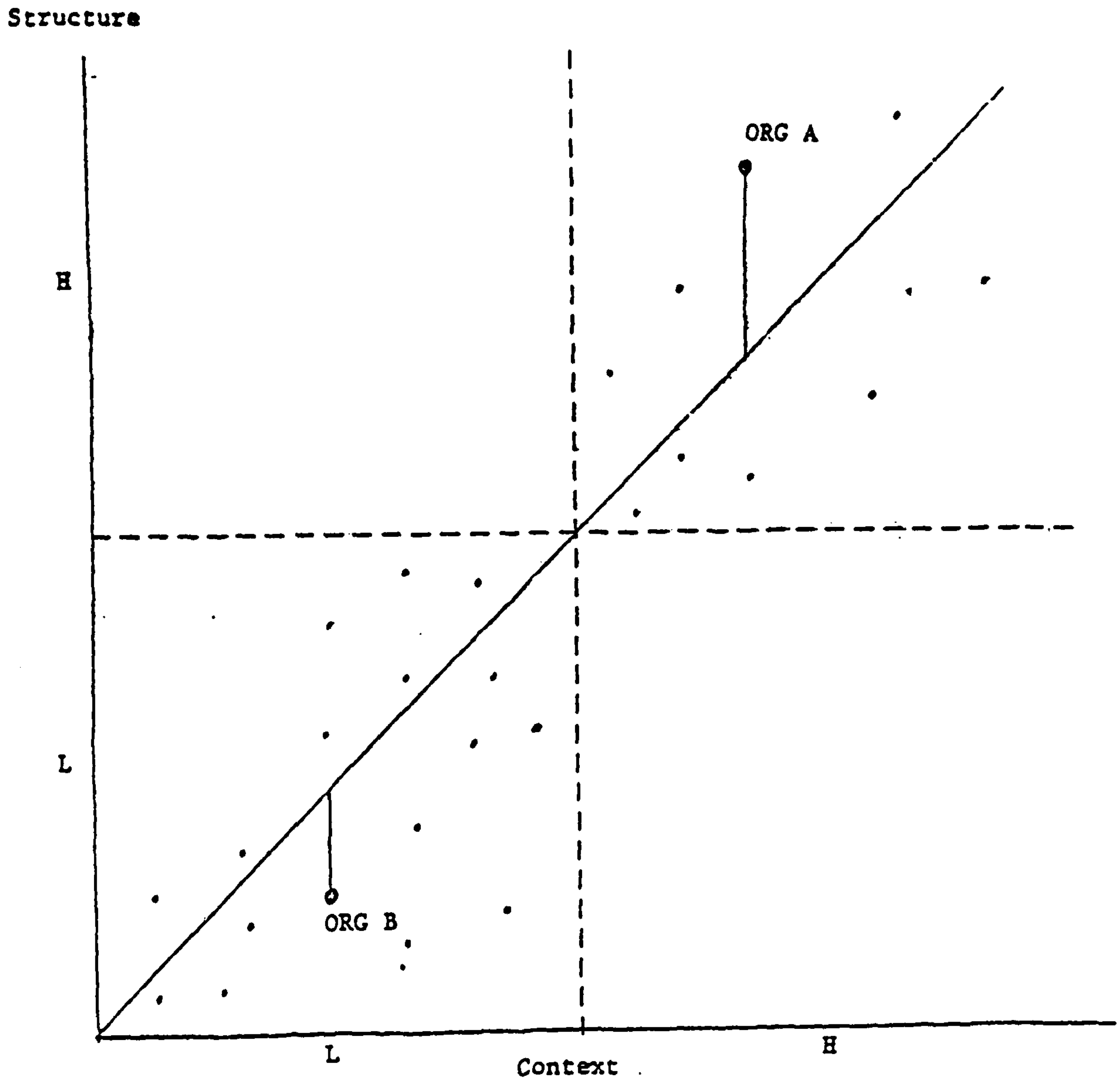
----Insert figure 3 about here----

In this example, the more an organization's pattern of scores deviates from its ideal type the lower the expected performance. All organizations that are equidistant from their ideal types in any direction are expected to exhibit the same level of performance. To illustrate this principle of isoperformance, contours are drawn as concentric circles around each ideal type to represent decreasing bands relationships among single context and design factors and how these relationships effect performance. This reductionism empirically, if not theoretically, treats the design of an organization as decomposable into parts that can be analyzed separately with knowledge about each of these interfaces adding up to knowledge of the total organization. As Bateson (1979) suggests, this constitutes an error of logical typing. By reducing or disaggregating an overall pattern of context-structure linkages to its subcomponent parts we lose sight of the coherence or fit of the overall system.

The systems approach to contingency theory reacts against this reductionism by positing forms of fit that recognize the multidimensional nature of organizations. Two general categories of fit are proposed as important in the systems approach: pattern analysis and equifinality. Only the pattern analysis approach will be described and tested in this paper. The reader is referred to Van de Ven and Drazin (1985) for speculations on tests of fit using equifinality concepts.

Systems theorists conceive of organizations as holistic entities, consisting of multiple elements and yet still distinguishable from the components alone. Components are related to each other in ways that yield a coherent ensemble for a particular environment. High performance results not only from fits of individual components to context alone, but also from fits between the components themselves (Child, 1975; Tushman and Nadler, 1978). In organization theory these ensembles have been referred to as as ideal types, modes, programs, populations, and gestalts. Much of this theorizing is explicitly in terms of types. Burns and Stalker (1961), Perrow (1967), Pugh, et al (1969), Mintzberg (1979), D. Miller (1981), and Hambrick (1984) have all identified basic patterns of organizing that are coherently designed to yield high performing

FIGURE 2. Context-Structure Relationship
With Deviating Organization



this approach have instead analyzed the impact of deviations in structure from an ideal context-structure model. Fit here is defined as adherence to a linear relationship between a context element and a structural element. A lack of fit results from a deviation from that relationship (Alexander, 1964). This approach is consistent with the normative presciptions of interactions in contingency theory - only certain designs are expected to be high performing in a given context and departures from those designs are expected to result in lower performance.

Figure 2 graphically displays this form of analysis. Organization A, being further away from the "ideal" context-structure relationship than organization B, is expected to have lower performance. Statistically, this form of fit is tested by correlating the absolute values of structure-process residuals with performance.

----Insert figure 2 about here----

One clear benefit of this approach over the interaction approach is shown in the exaggerated example of figure 2. Context and structure are highly correlated and a dichotomization of each, for the purposes of creating an ANOVA test, would simply result in empty cells. Yet there is obviously ample structural variation to test for fit using the deviation score approach. While this strategy is conceptually similar to hypothesizing and testing for disordinal, asymmetric forms of interactions (Kerlinger, 1973), it does manage to avoid the limitations of the latter approach when selection pressures are evident.

<u>The Systems Approach to Fit</u>

The selection and interaction approaches to fit focus on the <u>pairwise</u>

correlation with task uncertainty. The correlations of task uncertainty with the other unit design dimensions are substantially lower than these four. Only verbal communications is an exception. Overall, we conclude that while the evidence provides some support for both the natural and managerial selection forms of fit in the OA task contingency theory, greater support is shown for managerial selection than natural selection.

Interaction Approach Examined With ANOVA

The basic hypothesis in OA task contingency theory with the interaction approach is that task uncertainty interacts with individual characteristics of unit design to explain unit performance. The most common test of this hypothesis consists of a series of two-way analysis of variance procedures (or regressions) in which task uncertainty, individual unit design dimensions, and the interactions of task uncertainty with these dimensions are the independent variables, and efficiency and satisfaction in unit performance are the dependent variables. To conduct this test, task uncertainty was trichotomized into roughly equal categories representing low, medium and high levels of task uncertainty. The eleven unit design dimensions were dichotomized into low and high levels based on frequency counts. Twenty-two separate ANOVAS were conducted, eleven each for unit efficiency and job satisfaction as dependent performance variables.

Table 3 and 4 show the results of the ANOVA tests for job satisfaction and unit efficiency, respectively. A review of the last two columns of these tables shows that only one significant interaction effect exists to explain average unit satisfaction - conflict resolution by authority X task uncertainty. Given the substantial main effect of conflict resolution by authority on satisfaction, interpretation of this interaction effect should be made cautiously.

----Insert Tables 3 and 4 here----

These results using the interaction form of fit are discouraging and have led some researchers (e.g., Pennings, 1975) to question the overall relevance of structural contingency theory. However, since this form of fit is only one of the several that exist for contingency theory, it is the interaction form of fit, rather than contingency theory itself, that should be questioned.

Interaction Approach Examined with Deviation Scores

Another way to test the interaction form of fit in contingency theory is to compute deviations of residual scores from a regression line, as Ferry (1978), Dewar and Werbel (1979), and J. Miller (1981) have done. A two-step procedure was followed to conduct this "deviation score" test. First, deviation scores were constructed by regressing each unit design dimension separately on task uncertainty. Residuals were calculated from the best-fitting least squares lines. The absolute values of these residuals were used as deviation scores. Second, the actual test of fit itself was conducted. The eleven deviation scores developed above were separately regressed on efficiency and satisfaction. If the correlations of the deviation scores with efficiency and satisfaction are significant and negative (the greater the deviation the lower the performance), then evidence of fit is presumed to exist.

The results of the unit design-task uncertainty regressions used to create the deviation scores are shown in Table 5. Note that, due to

TABLE 3 ANALYSIS OF VARIANCE OF TASK UNCERTAINTY AND UNIT STRUCTURE AND PROCESS ON JOB SATISFACTION [1]

	Task Uncertainty Main Effect		Structure/Process Main Effect		Interaction Effect	
	F	p<	F	p<	F	p<
UNIT STRUCTURE						
Unit Specialization	1.85	.158	.45	500	2.23	.108
Unit Standardization	1.90	.151	12.50	.0004	2.13	.121
Personnel Expertise	1.85	.157	4.47	.035	.91	.402
Supervisory Discretion	1.86	.157	4.66	.031	.95	.387
Employee Discretion	1.86	.158	1.48	.225	2.55	.079
UNIT PROCESS						
Written Communication	1.84	.159	.04	.841	1.84	.159
Verbal Communication	1.88	.154	8.67	.003	1.55	.212
Frequency of Conflict						
Conflict Resolution by:						
Avoidance and Smoothing	1.95	.144	29.30	.0001	.40	.667
Confrontation	2.01	.135	45.73	.0001	.14	8.65
Authority	1.99	.137	34.21	.0001	3.90	.021

[1] N = 473

TABLE 4 ANALYSIS OF VARIANCE OF TASK UNCERTAINTY AND UNIT STRUCTURE AND PROCESS ON EFFICIENCY[1]

	Task Uncertainty Main Effect		Structure/Process Main Effect		Interaction Effect	
	F	p<	F	p<	F	p<
UNIT STRUCTURE						
Unit Specialization	.31	.733	2.59	.109	1.67	.189
Unit Standardization	.31	.734	1.00	.318	1.80	.168
Personnel Expertise	.30	.738	.11	.735	.20	.819
Supervisory Discretion	.31	.736	.04	.843	1.02	.363
Employee Discretion	.31	.735	.40	.525	1.66	.192
UNIT PROCESS						
Written Communication	.31	.736	.84	.361	.54	.583
Verbal Communication	.31	.736	1.49	.224	.51	.604
Frequency of Conflict	.30	.737	.69	.401	.18	.836
Conflict Resolution by:						
Avoidance and Smoothing	.30	.738	.47	.495	.09	.910
Confrontation	.31	.737	.46	.496	.58	.560
Authority	.31	.736	1.30	.225	.55	.580

[1] N = 230

the low correlations reported earlier for certain design dimensions with task uncertainty, some beta values are quite close to zero. This indicates that deviation scores should be interpreted as roughly equivalent to dispersion around the means for these variables. The results of the actual tests of fit using the deviation scores calculated from the above equations are shown in Table 6. Column 1 shows the correlations of these scores with job satisfaction and column 2 shows the corresponding correlations with unit efficiency.

--Insert Tables 5 and 6 about here--

Of the 22 correlations in Tables 5 and 6, only four are significant at the .05 level. Deviations for verbal communications were positively correlated with satisfaction. This result is hard to interpret given the expectation of a negative correlation. Three other correlations are *significant and negative:* conflict resolution by avoidance and smoothing with job satisfaction, supervisory decision making with unit efficiency, and conflict resolution by authority with unit efficiency. However, the correlations are weak; the highest one is only -.18. Since only 4 of the 22 possible relationships are significant, it is probable that these results are due to chance alone.

Thus, deviation score results are equally as disappointing as the ANOVA results in testing the interaction approach to fit. In both cases no support for the interaction form of fit is provided by the data base.

Systems Approach to Examine Design Patterns

As Figure 4 shows, the OA task contingency theory is essentially a theory of organizational modes, rather than a theory of individual task-design linkages. By definition, mode is a logically coherent

TABLE 5 RESULTS OF REGRESSION ANALYSES OF UNIT STRUCTURE AND PROCESS ON TASK UNCERTAINTY TO CREATE DEVIATION SCORES[1]

	Intercept	Beta	F	p<
UNIT STRUCTURE				
Unit Specialization	5.496	-.176	5.01	.0260
Unit Standardization	4.714	-.561	98.01	.0001
Personnel Expertise	1.754	.731	145.5	.0001
Supervisory Discretion	3.176	-.086	2.29	.1310
Employee Discretion	3.022	.214	11.78	.0240
UNIT PROCESS				
Written Communication	.955	.351	47.94	.0001
Verbal Communication	1.706	.475	56.98	.0001
Frequency of Conflict	1.589	.236	9.16	.0026
Conflict Resolution by:				
Avoidance and Smoothing	2.439	-.067	.87	.3510
Confrontation	3.112	.114	1.64	.2010
Authority	3.042	-.146	3.14	.0770

[1] N = 471

TABLE 6 CORRELATIONS OF DEVIATION SCORES WITH JOB SATISFACTION AND UNIT EFFICIENCY[1]

Deviation Scores	Job Satisfaction	Unit Efficiency
UNIT STRUCTURE		
Unit Specialization	.042	-.020
Unit Standardization	-.035	-.053
Personnel Expertise	.010	-.050
Supervisory Discretion	.005	-.173[B]
Employee Discretion	-.030	-.040
UNIT PROCESS		
Written Communication	.070	.054
Verbal Communication	.106[A]	.052
Frequency of Conflict	-.078	-.033
Conflict Resolution by:		
Avoidance and Smoothing	-.114[A]	-.089
Confrontation	-.033	-.082
Authority	-.078	-.033

A -- $p < .05$

B -- $p < .01$ N = 471 N = 230

1 Absolute values of task-structure residuals

pattern of structure and process matched to a given level of task uncertainty. Low, medium, or high levels of task uncertainty are expected to be correlated, respectively, with systematized, discretionary, and developmental patterns of unit design. When they are not, lower performance is expected. Any of the several ways in which this departure may occur will disturb the internal integrity of the prescribed unit design pattern.

Conceptually, the systems approach is similar to the deviation score analysis above. However, with the systems approach deviation is measured as the distance from a point in an eleven dimension, geometric profile rather than as the distance from a single linear equation line. Thus, systems analysis focuses on differences in pattern profiles and accounts for the set of all eleven unit structure and process variables. In contrast, the interaction approach analyzes the fit between task uncertainty and each of the unit design characteristics at only one dimension at a time.

The same three-step procedure used to analyze the interaction form was also used to analyze the pattern form of fit. Pattern profiles were generated for the highest performing units (based on the efficiency measure) under conditions of low, medium, and high task uncertainty. The mean scores on these 11 structure and process dimensions were considered as empirically derived "ideal" types representing the systematized, discretionary, and developmental modes. ANOVA and MANOVA tests were run on these ideal types to determine if their profiles actually differed and a comparison was made between the profiles generated and the theory shown in Figure 4 to determine if the derived values matched the predicted ordinal relationships. Second, differences between these ideal patterns and the patterns of individual units were then calculated using the eucledian distance formula.

Third, the calculated DIST for all units in the sample was correlated with the two performance measures of satisfaction and efficiency for the actual test of the pattern approach to contingency theory. Lack of fit would be demonstrated if this distance score were negatively correlated with the performance measures. The greater the distance from the respective ideal type the lower the hypothesized performance.

The results of the first step of the pattern analysis procedure are shown in Table 7. They show the unit design profiles of high efficiency units under conditions of low, medium, and high task uncertainty. The last column shows the results of one-way ANOVAs to determine if the means of the profiles on each dimension were different. Seven of the 11 design dimensions showed significant differences at the .10 level. In addition, an overall MANOVA using all 11 variables was also significant ($F = 2.94$; $p < .0004$). Where significant differences did occur, the patterns of scores matched very closely the patterns predicted in Figure 4. These profiles represent the systematized, discretionary, and developmental modes of the OA task contingency theory.

----Insert Table 7 about here----

Given these findings, distances for all units were calculated from their relevant ideal types (depending on their level of task uncertainty). These distance measures were then correlated over all units with unit efficiency and job satisfaction. The results of this analysis are shown in Table 8. As predicted, both unit efficiency and job satisfaction are negatively correlated with a unit's distance from

TABLE 7 PROFILES OF MEAN UNIT STRUCTURE AND PROCESS SCORES FOR HIGH EFFICIENT LOW, MEDIUM, AND HIGH TASK UNCERTAINTY UNITS[1]

	Task Uncertainty				
	Low	Medium	High	F	p<
UNIT STRUCTURE					
Unit Specialization	-.078	-.154	.257	7.22	.002
Unit Standardization	.445	.085	-.477	12.95	.0001
Personnel Expertise	-.215	-.132	.343	3.99	.026
Supervisory Discretion	.026	.210	-.283	2.52	.093
Employee Discretion	-.157	-.057	.201	1.94	.156
UNIT PROCESS					
Written Communication	-.337	.048	.214	4.02	.025
Verbal Communication	-.275	-.002	.228	3.01	.060
Frequency of Conflict	-.141	-.101	.243	1.01	.375
Conflict Resolution by:					
Avoidance and Smoothing	-.150	.044	.067	.29	.751
Confrontation	.248	-.101	-.075	.11	.898
Authority	.399	-.252	-.005	3.36	.049

[1] Based on standardized scores--plotted in figure 6.

its ideal profile. Efficiency correlated -.25 ($p < .0001$) with distance and satisfaction correlated -.14 ($p < .003$) with distance.

----Insert Table 8 about here----

To be certain that these correlations were not significantly influenced by the small number of high performing units on which the ideal patterns were initially created, the analysis was rerun with these units omitted. The resulting correlations hardly dropped at all. Thus, one cannot conclude that the findings are due to the tautology of testing the same units which originally formed the ideal profiles for the analysis. Instead, our original findings are reconfirmed: departures from the ideal patterns for each level of task uncertainty significantly influences unit performance.

TABLE 8 CORRELATIONS OF DISTANCE MEASURE WITH UNIT EFFICIENCY AND JOB SATISFACTION

	DISTANCE
Unit Efficiency	$-.250^{A}$
Job Satisfaction	$-.135^{B}$

^{A} $p < .0001$, N = 230

^{B} $p < .003$, N = 473

CONCLUDING DISCUSSION AND IMPLICATIONS

This paper has inspected the concept of "fit" in contingency theory. As Alexander (1964) has stated, fit is the essence of design, and as such deserves much more careful attention and development than it has been given in the past. In the evolution of contingency theory, Van de Ven and Drazin (1985) suggest that three different approaches to fit have emerged: selection, interaction, and systems. Each approach significantly alters the essential meaning of contingency theory and variations in these approaches lead to a repertoire of contingency theories. An empirical examination of each approach to fit in the OA task contingent model of work unit design was presented, based on a study of employment security organizations in California and Wisconsin. The major findings were the following.

First, part-whole relationships are important in understanding the design of organizational subunits. Managerial selection, operating through macro-organizational switching rules that are contingent upon task uncertainty, has a significant influence on the structural characteristics of subunits. However, the process characteristics of subunits appear to be less influenced by these macro switching rules and tend to reflect more the particularistic style and discretion of unit personnel. With the exception of Comstock and Scott (1977), these findings and their consequences have been overlooked in many studies of organizational subunits. Consistent with Comstock and Scott's findings, the results obtained here emphasize that the design cho.ce for a particular organizational level is constrained and limited by imposed design criteria from higher levels in that organization. These findings not only support the managerial selection viewpoint, but also have important implications for the understanding of other patterns of fit in contingency theory.

Second, no empirical evidence was obtained to substantiate the interaction approach to fit in the OA task contingent model. Even though these results are consistent with previous analyses (Ferry, 1979; Van de Ven and Drazin, 1978; and Van de Ven and Ferry, 1980), they were still disturbing. However, empirical support for the selection approach to fit implies that little variance exists for unit structure within levels of task uncertainty. For reasons discussed below, the probability of detecting significant interactions of task uncertainty and structure on unit performance in an analysis of variance design is substantially reduced.

In addition, the deviation score approach to fit, designed to overcome some of the limitations of the interaction approach, also failed to yield significant results. One explanation for this finding may lie in the difficulties associated with choosing the base line context-structure relationship (Dewar and Werbel, 1979) from which residuals are calculated. If the regression equation chosen does not adequately represent high-performing units, then deviations from that equation will not be meaningful.

Significant empirical support was obtained for the OA task contingent model when it is viewed as a theory of organizational modes (systematized, discretionary, and developmental), and correspondingly assessed with a systems approach to fit. Fit was explained by the departure from a multivariate pattern of unit context and design, and not by the departures of isolated pairs of unit context and design parameters. Thus, a given design characteristic, such as unit standardization, may be a perfect match with that unit's task uncertainty, yet overall unit performance may

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Primarily, this paper has addressed structural contingency theory. Fit, however, is a concept of broad utility that is central to an increasingly wide set of theories on organizational behavior, management strategy, and policy. For the building and testing of any theory postulating organizational performance as a function of the match, congruence, intersection, or union of two or more factors, these concepts of fit are of consumate importance.

disadvantages of ANOVA and deviation score designs of the interaction approach are serious enough to render them of little use. Specifically, the researcher should be cautioned about two conditions against applying the interaction approach.

First, when evidence for natural selection or managerial selection exists in the form of strong context-design relationships, the interaction design will probably not be capable of detecting fit or misfit.

Second, when the contingency theory is based, even remotely, on types or modes of organization design, rather than on relationships among dimensions, then multivariate pattern analysis in the systems approach will be more appropriate.

As these caveats imply, we believe that greater energy should be directed toward developing more general multivariate models of fit in the systems approach. The pattern analysis approach provides a promising direction. Efforts should be devoted to developing more sensitive versions of the procedure presented in this paper.

The systems approach to the concept of fit also calls for a more in-depth study of the implications of equifinality in organizational design. This is very necessary in order to explain theoretically and empirically what is observed casually in everyday organizational life: there are many equally effective ways to organize and manage in a given situation. An appreciation of equifinality could also yield a theoretically rich understanding of trade-offs and substitution effects among design variables (Van de Ven and Drazin, 1985).

4. <u>These concepts of fit apply not only to structural contingency theory but to contingency theory in general</u>.

research in that area. By documenting results and accumulating knowledge across and between organizational levels and populations, significant advances in mid-range theory are possible (Pinder and Moore, 1979). If future subunit studies replicate the findings on the alternative approaches to fit reported above, we will begin to understand more about part-whole relationships. If a series of studies at an industrial level of analysis (or for professional rather than bureaucratic subunits) shows a different pattern of findings, then some systematic relationships between types or levels of organizations may become evident. Knowing that forms of fit differ across conditions will be useful in clearing up inconsistent contingency theory findings. Reporting tests of only one form of fit leaves more questions unanswered than answered.

Designing other studies that test competing approaches to fit would also be useful in increasing our knowledge about contingency theory. On strong apriori grounds a planned study could postulate that one form of fit will prevail over others. By conducting crucial experiments (Stinchcombe, 1968), types of fit can be tested against competing alternatives and thereby provide more meaningful results than could be provided by testing only one approach to fit.

3. Overall, emphasis should be placed on the further development of systems approaches to fit in contingency theory.

The results that we and other researchers have obtained from pairwise studies of fit have been exceedingly disappointing. We believe this is not from a fault inherent to the interaction concept itself but rather from the limited statistical probability of a sample containing the right characteristics to yield meaningful results. Except under exceedingly appropriate conditions, the an overall conceptual framework, data should be collected on multiple indicators of organizational context, design, and performance. A major limitation of many studies has been their overly narrow focus on only one or a few contextual dimensions, thus precluding the exploration of the effects of multiple and conflicting contingencies on organizational design and performance.

Researchers should also be encouraged to test for a number of approaches to fit in order to obtain a more complete understanding of context-design-performance relationships for organizations in their sample. As shown in the previous section, these different approaches to fit are not independent and can provide synergistic information. For example, the selection approach is useful for determining which contingency factors most significantly effect the design of organizational units. The interaction approach provides a rudimentary understanding of how these context and design characteristics individually interact to explain performance. However, as will be discussed below, a sample of organizational units in moderate equilibrium with their environments may preclude the possibility of significant interaction effects. As a result, a more complex, but richer approach to the analysis of fit may be necessary. The systems approach, which focuses on a multivariate pattern of fits among context and design characteristics, may yield the most meaningful information.

2. By examining multiple approaches to fit in contingency studies and relating these findings to unique sample characterisitics, the development of mid-range theories of the applicability of different types of fit can be greatly aided.

We believe that the evaluation of multiple approaches to fit in the OA task contingency theory shows the importance of continued still be low. Other unit design characteristics not included in the analysis may be inconsistently matched with unit standardization or with task uncertainty and thereby generate this result. Pairwise analysis is simply not capable of detecting overall patterns of internal consistency among unit context and design configurations. Inconsistencies in unit designs arising from departures from the three ideal type patterns (systematized, discretionary, and developmental modes) were significantly related to performance. By viewing the OA task contingent model as a theory of organizational modes and adopting a systems approach to fit, fit was shown to be a significant predictor of unit performance.

Overall, these empirical findings suggest that an explanation for the performance of organizational units requires much more sophisticated contingency theory and methodology than prior efforts have produced. A contingency model for the subunits in this sample appears to require that *fit be the joint product of* managerial selection and departures from an ideal multivariate pattern. No evidence was found to support the mainstream view of contingency theorists that fit is the simple interaction between isolated pairs of unit context and design dimensions on performance.

These research findings have a number of broader implications for contingency theories in general. Although we know far too little about contingency theory fits to be dogmatic, we can conclude the following.

1. Contingency studies should be designed to permit comparative evaluation of as many forms of fit as possible.

   At the most rudimentary level, this means that contingency theory studies should be broadly conceived at the outset to avoid serious limitations of narrowness in subsequent analyses of fit. Within

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San Diego, CA 92152

Psychology Department
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San Diego, CA 92134

Commanding Officer
Naval Submarine Medical
Research Laboratory
Naval Submarine Base
New London, Box 900
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National Naval Medical Center
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Naval Academy, U.S.
Annapolis, MD 21402

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Organizational Effectiveness Center
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Naval Base (Bldg. NH-46)
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Organizational Effectiveness Center
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Commanding Officer
Organizational Effectiveness Center
1300 Wilson Boulevard, rm 114A8
Arlington, VA 22209

Commanding Officer
Organizational Effectiveness Center
5621-23 Tidewater Drive
Norfolk, VA 23509

Commander
Organizational Effectiveness Center
5621 Tidewater Drive
Norfolk, VA 23509

Commanding Officer
Organizational Effectiveness Center
Naval Air Station Whidbey Island
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Commanding Officer
Organizational Effectiveness Center
Box 23
FPO New York 09510

Commanding Officer
Organizational Effectiveness Center
Box 41
FPO New York 09540

Commanding Officer
Organizational Effectiveness Center
Box 60
FPO San Francisco 96651

Commanding Officer
Organizational Effectiveness System, Pacific
Pearl Harbor, HI 96860

Commanding Officer
Organizational Effectiveness System, Atlantic
5621 Tidewater Drive
Norfolk, VA 23509

Commanding Officer
U.S. Navy Organizational Effectiveness System, Europe
FPO New York 09510

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FPO Seattle 98762

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Orlando, FL 32813

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Orlando, FL 32813

Chief of Naval Education
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Director, Research Development,
Test and Evaluation
Naval Air Station
Pensacola, FL 32508

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ATTN: Code D17
NAS Memphis (75)
Millington, TN 38D54

Navy Recruiting Command
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Code 434, Room 8001
801 North Randolph Street
Arlington, VA 22203

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Code 40
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Command and Staff College
Quantico, VA 22134

LIST 9
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Technology Office
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Arlington, VA 22209

Dr. Douglas Hunter
Defense Intelligence School
Washington, DC 20374

Dr. Brian Usilaner
GAO
Washington, DC 20548

National Institute of Education
EOLC/SMO
1200 19th Street, N.W.
Washington, DC 20208

National Institute of Mental Health
Division of Extramural Research Programs
5600 Fishers Lane
Rockville, MD 20852

National Institute of Mental Health
Minority Group Mental Health Programs
Room 7 - 102
5600 Fishers Lane
Rockville, MD 20852

Office of Personnel Management
Office of Planning and Evaluation
Research Management Division
1900 E Street, N.W.
Washington, DC 20415

Chief, Psychological Research Branch
U.S. Coast Guard (G-P-1/2/TP42)
Washington, D.C. 20593

Social and Developmental Psychology
Program
National Science Foundation
Washington, D.C. 20550

Dr. Earl Potter
U.S. Coast Guard Academy
New London, CT 06320

Division of Industrial Science
& Technological Innovation
Productivity Improvement Research
National Science Foundation
Washington, D.C. 20550

Douglas B. Blackburn, Director
National Defense University
Mobilization Concepts Development
Center
Washington, D.C. 20319

Chairman, Dept. of Medical Psychology
School of Medicine
Uniformed Services University of
the Health Sciences
4301 Jones Bridge Road
Bethesda, MD 20814

LIST 10
ARMY

Headquarters, FORSCOM
ATTN: AFPR-HR
Ft. McPherson, GA 30330

Army Research Institute
Field Unit - Leavenworth
P.O. Box 3122
Fort Leavenworth, KS 66027

Technical Director (3 copies)
Army Research Institute
5001 Eisenhower Avenue
Alexandria, VA 22333

Head, Department of Behavior
Science and Leadership
U.S. Military Academy, New York 10996

Walter Reed Army Medical Center
W. R. Army Institute of Research
Division of Neuropsychiatry
Forest Glen
Washington, D.C. 20012

Army Military Personnel Command
Attn: DAPC-OE
200 Stovall Street
Alexandria, VA 22322

Research Psychologist
Selection and Classification Performance
Measurement Team
Army Research Institute
Attention: PERI-SF (Mr. Dennis Leedom)
5001 Eisenhower Avenue
Alexandria, VA 22333

Commanding Officer
Organizational Effectiveness Center & School
Fort Ord, CA 93941

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Maxwell AFB, AL 36112

Head, Department of Behavioral
Science and Leadership
U.S. Air Force Academy, CO 80840

MAJ Robert Gregory
USAFA/DFBL
U.S. Air Force Academy, CO 80840

AFOSR/NL
Building 410
Bolling AFB
Washington, DC 20332

Department of the Air Force
HQUSAF/MPXHL
Pentagon
Washington, DC 20330

Technical Director
AFHRL/MO(T)
Brooks AFB
San Antonio, TX 78235

AFMPC/MPCYPR
Randolph AFB, TX 78150

LIST 12
MISCELLANEOUS

Australian Embassy
Office of the Air Attache (S3B)
1601 Massachusetts Avenue, N.W.
Washington, D.C. 20036

British Embassy
Scientific Information Officer
Room 509
3100 Massachusetts Avenue, N.W.
Washington, DC 20008

Canadian Defense Liaison Staff,
Washington
ATTN: CDRD
2450 Massachusetts Avenue, N.W.
Washington, DC 20008

Commandant, Royal Military
College of Canada
ATTN: Department of Military
Leadership and Management
Kingston, Ontario K7L 2W3

National Defence Headquarters
DPAR
Ottawa, Ontario K1A OK2

Mr. Luigi Petrullo
2431 North Edgewood Street
Arlington, VA 22207

Sequential by Principal Investigator

LIST 13
CURRENT CONTRACTORS

Dr. Clayton P. Alderfer
Yale University
School of Organization and Management
New Haven, Connecticut 06520

Dr. Janet L. Barnes-Farrell
Department of Psychology
University of Hawaii
2430 Campus Road
Honolulu, HI 96822

Dr. Jomills Braddock
John Hopkins University
Center for the Social Organization
of Schools
3505 N. Charles Street
Baltimore, MD 21218

Dr. Sara Yogev
Northwestern University
Graduate School of Management
2001 Sheridan Road
Evanston, IL 60201

Dr. Terry Connolly
University of Arizona
Department of Psychology, Rm. 312
Tucson, AZ 85721

Dr. Richard Daft
Texas A&M University
Department of Management
College Station, TX 77843

Dr. Randy Dunham
University of Wisconsin
Graduate School of Business
Madison, WI 53706

List 13 (continued)

Dr. J. Richard Hackman
School of Organization
and Management
Box 1A, Yale University
New Haven, CT 06520

Dr. Wayne Holder
American Humane Association
P.O. Box 1266
Denver, CO 80201

Dr. Daniel Ilgen
Department of Psychology
Michigan State University
East Lansing, MI 48824

Dr. David Johnson
Professor, Educational Psychology
178 Pillsbury Drive, S.E.
University of Minnesota
Minneapolis, MN 55455

Dr. Dan Landis
The University of Mississippi
College of Liberal Arts
University, MS 38677

Dr. Frank J. Landy
The Pennsylvania State University
Department of Psychology
417 Bruce V. Moore Building
University Park, PA 16802

Dr. Bibb Latane
The University of North Carolina
at Chapel Hill
Manning Hall 026A
Chapel Hill, NC 27514

Dr. Cynthia D. Fisher
College of Business Administration
Texas A&M University
College Station, TX 77843

. Thomas M. Ostrom
e Ohio State University
partment of Psychology
6E Stadium
4C West 17th Avenue
lumbus, OH 43210

·. William G. Ouchi
iversity of California,
Los Angeles
:aduate School of Management
›s Angeles, CA 90024

:. Robert Rice
:ate University of New York at Buffalo
epartment of Psychology
iffalo, NY 14226

r. Benjamin Schneider
epartment of Psychology
niversity of Maryland
ollege Park, MD 20742

r. H. Wallace Sinaiko
rogram Director, Manpower Research
and Advisory Services
mithsonian Institution
01 N. Pitt Street, Suite 120
lexandria, VA 22314

r. Eliot Smith
sychology Department
urdue University
est Lafayette, IN 47907

r. Barbara Saboda
ublic Applied Systems Division
estinghouse Electric Corporation
.O. Box 866
olumbia, MD 21044

r. Harry C. Triandis
epartment of Psychology
niversity of Illinois
hampaign, IL 61820

Dr. Anne S. Tsui
Duke University
The Fuqua School of Business
Durham, NC 27706

Dr. Andrew H. Van de Ven
University of Minnesota
Office of Research Administration
1919 University Avenue
St. Paul, MN 55104

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