SOME OBSERVATIONS ON
THE DETERMINANTS OF
ORGANIZATIONAL PERFORMANCE

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This paper was written while I was a visiting scholar at the Institute of
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STUDIES IN PUBLIC ORGANIZATION

Through this series of working papers, the Institute of Governmental Studies, Berkeley, provides a channel through which scholars at work on problems of public organization may present their thoughts in a convenient form and without too much delay. We envision this series as a modest undertaking, but we hope that "Studies in Public Organization" will make some contribution toward an understanding of the properties that describe the variety of public organizational systems that exist throughout the world. We want also to note that no single formula will dominate; the series will contain papers that are theoretical, methodological, comparative, or historical. It is open to faculty and student contributions alike, not restricted to this campus, and its objective is to publish papers that engage important problems and present interesting ideas.

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Introduction

Organizational performance, as usually understood, refers to the extent to which an organization succeeds in achieving its goals and objectives. In principle, publicly stated goals and objectives provide a yardstick against which an organization's "success" (i.e., "performance") can be measured. But, as any perusal of the writings in public administration will reveal, the identification and measurement of performance is not quite that simple. Clarity of goal is seldom found in formal statements of organizational objectives, and, thus, a considerable ambiguity attends the concept of performance.

In an effort to solve this problem, most studies have focused on some aspect of goal attainment. Some seek to obtain directly observable, quantifiable indicators of output, for example: number of patients successfully treated in a hospital, kilometers of roads constructed by a road building agency, SAT scores of a high school graduation class. These indicators of output or end-products, generally derived from an organization's formal statement of purpose, can then be compared against targets that the organization has set for itself, or that are imposed on the organization by outside evaluators. Alternatively, rather than focusing on outputs, other studies of organizational performance examine the extent to which planned steps in implementing a program are successfully executed—as, for example, in network techniques such as PERT/CPM. Still other studies measure the performance of individuals within organizations, on the rather questionable assumption that organizational outputs can be inferred from the aggregate of individual performances.  

These approaches to measuring organizational performance have some utility. The problem, however, is that studies which do not measure outputs or end products fail to take account of the fact that the initial means-ends hypothesis contained in an organization's program or plan may simply have been incorrect. There is generally no way to tell from studies that focus on

* I am indebted to Martin Landau, Todd LaPorte, and Christopher Achen for their careful reading of this paper and for their valuable and constructive suggestions.

means, whether or not intended outcomes or end-products were actually obtained. We are all aware by now that very many rural development programs in the LDCs were predicated on assumptions about villager attitudes and behaviors that were ultimately discovered to be false. As for approaches which focus on measuring outputs, two major defects come to mind. First, output measures usually cannot be justifiably employed for comparative studies of organizations that perform different functions and possess different goals and purposes, because indicators in such cases are generally non-comparable. Agency A built 150 kilometers of roads last year; agency B built 2 hospitals. Who is to say which agency has the better performance record? Second, single dimensions are seized upon as surrogate measures of what may be a multidimensional construct, a procedure that has neither theoretical nor empirical warrant.

Why do we say that performance may be a multidimensional construct? The reason becomes apparent when we "unpack" the meaning of the term. Measures of organizational outputs almost invariably emphasize quantity, but the concept of performance itself denotes both quality as well as sheer quantity. We generally do not say of a doctor who has successfully operated on ten patients that his performance is less satisfactory than that of a doctor who has successfully operated on thirty patients. And especially not if we do not know the nature of the operations or the difficulty associated with each. Moreover, performance is often understood to imply some degree of "efficiency," the ratio of inputs to outputs, as well as "effectiveness," as measured by outputs only.

Yet, for all the difficulties associated with defining and appraising organizational performance, the construct occupies a central place in public administration. In the final analysis, public administration reduces to the study of the performance of public organizations. And one of the critical areas of interest to students and practitioners of public administration alike has been to identify and examine the determinants of organizational performance.

In the field of development administration in particular, most of the key hypotheses that deal with the determinants of performance focus on the linkage between attributes of organizational actors and organizational performance as a whole. In fact, it can be said that the
dominant paradigm in development administration is based on theories which explain differences in bureaucratic behavior and output on the basis of the concept "culture and personality." Derived directly from anthropological and sociological formulations, these theories are at one in accounting for such behavior in terms of the systems of shared values, of folkways and mores, along with those institutionalized constraints or social norms that are determining.

Theories -- or the way in which one explains empirical phenomena -- are not mere intellectual abstractions or exercises; they represent our causal perceptions of the world, and hence they carry with them policy implications. If we believe that the values of organizational actors, as determined by cultural norms and social mores, are of primary importance in explaining organizational performance, then the policy implication of this hypothesis is that we attempt to alter performance (should we wish to do so) by inducing a change in the values held by organizational actors. We might, for example, allocate funds for higher education, assuming that education has an effect on values, or we might invest in training programs, or observational tours, etc. And we might endeavor to institute rules and regulations to act as constraints on organizational actors: that is, if the values they hold are perceived to conflict with the attainment of organizational goals. And so forth. Given the importance of theories in terms of policy implications, it is more than a little strange to find that the dominant paradigm in development administration has never been seriously tested against empirical data, that its truth value has been so universally accepted.

This becomes even more puzzling when we observe that in the field of organization theory, a set of constructs exist that explain organizational performance not in terms of attributes of organizational actors, but in terms of organizational properties that have nothing to do with individuals in organizations. We may well ask, why has development administration chosen to focus so exclusively on properties of organizational actors, and why has it ignored that other body of theory?

These are questions which this paper does not seek to answer. Rather, the purpose of this paper is to report empirical findings that cast doubt on hypotheses that have to do with the
causal relationship assumed to exist between particular kinds of attitudes and behaviors of bureaucrats and organizational performance; its findings suggest that certain properties of organizations, rather than properties of individuals in organizations, are more appropriate for explaining organizational performance. Logically, these two hypotheses are not necessarily mutually exclusive. For the purposes of this paper, however, in order to provide a stronger test, personalistic theories and organizational attribute theories of performance will be treated as constituting two competing hypotheses, i.e., as mutually exclusive. If the empirical evidence supports one hypothesis while rejecting the other, we shall have advanced a little in our understanding of what actually goes on.

This paper, then, will test two competing hypotheses, each of which deals with determinants of organizational performance. Hypothesis I asserts that organizational performance can be explained in terms of organizational properties -- specifically, redundancy-related variables. Hypothesis II claims that organizational performance is related to certain types of norms and values, expressed by Parsonian pattern variables, that are held by organizational actors. The first section of this paper describes the performance measure that was utilized in the study. The next section tests Hypothesis I. It draws upon the theory of redundancy in selecting a set of redundancy-related organizational characteristics for observation. These organizational characteristics or redundancy-related variables are then analyzed to assess the effect they produce on organizational performance. The third section addresses the competing hypothesis. It tests the dominant paradigm in development administration, as expressed by the Parsonian pattern variables. The fourth section presents the results of multiple regression analysis when the two competing hypotheses are tested against each other.
The Measurement of Performance

The performance measure developed here was applied to a sample of 45 divisions drawn from 6 departments in the Ministry of Agriculture and Cooperatives, Royal Thai Government.\(^2\) What we sought was a general measure of performance that could be applied to a large number of organizations (i.e., divisions) having different functions, and that could distinguish between overall levels of performance.

Our technique relies on respondent evaluations that yield a performance index based on judgmental ratings.\(^3\) Respondents were asked to rate other divisions within their own departments on a scale of 1 ("extremely ineffective and inefficient") to 10 ("extremely effective and efficient"). We assumed that respondents' ratings represented their overall impression of a division's performance. We should note that in the Thai language, there is no exact translation for "performance" that captures all of the ambiguity and subtlety of meaning that is contained in the English. Terms such as "output," "product," "effectiveness," and "efficiency" are used instead. The Thai words for "effectiveness" and "efficiency," prasithiphol and prasithiphab, are terms of fairly recent coinage; their usage is generally restricted to technical contexts or formal language. Prasithiphol connotes the production of outputs or end-products. Prasithiphab carries the same connotations as the English word.

Accordingly, in our questionnaire we used the words "efficiency and effectiveness" to denote performance. Respondents were asked to make distinctions between the "efficiency and effectiveness" of organizational units with which they were extremely familiar -- qualities quite well understood by most people in these settings. To be sure, the validity of the measurement procedure hinges on the perceptions of respondents with respect to organizational performance.

\(^2\) The administrative structure of the Thai Government consists of 11 ministries plus an Office of the Prime Minister. Each ministry contains an average of 6-10 departments. Departments are divided into divisions (typically 6-10 to a department), and divisions are subdivided into sections. In this study, the division is the unit of analysis. A division will typically contain 30-40 officials, but there is considerable variation in size, ranging from a minimum of 15 persons to a maximum of about 200.

\(^3\) A sample of 788 respondents was drawn from the 45 divisions through a stratified random sampling procedure. Respondents had spent an average of 13 years in the civil service, 12 of them in their present department, and 8 of them in their present division.
In this particular instance, such validity appears to be established on two grounds: first, respondents were familiar with the divisions they were rating, each possessing an experiential record on which to make an assessment; and second, there was a surprisingly high degree of agreement among respondents' ratings--statistical tests showed a very high degree of inter-rater reliability.

Our respondents rated only divisions within their own department, not those outside. Thus direct comparisons of divisions across departments could not be made -- a mean z-score of e.g., .85 for division 1 in department A, therefore, cannot be interpreted to mean the same as a mean z-score of .85 for division 2 in department B. To overcome this problem, performance ratings at the departmental level were also obtained using a similar procedure. Performance scores for divisions within departments were then combined with performance scores for departments as a whole to form a single score to represent each division. The estimation procedure, in effect, treated division scores as deviations around a departmental mean. The resulting mean scores for divisions reflect divisional performance while making appropriate adjustments for interdepartmental differences. Full details of the procedure have already been reported elsewhere.

Organizational Characteristics and Organizational Performance

The central theoretical notion, that which informed the hypothesized relation between specific organizational properties and performance, stem from Landau's seminal work on redund-
Organizational redundancy refers to the presence of parallel channels, and alternative, duplicate, and overlapping pathways, that increase the reliability of performance by reducing the risk of error and the effect of error. Redundancy theory calls for the arrangement of organizational structures and linkages in such a manner as to ensure a system in which the whole is more reliable than any of its parts.

Redundant structures, in order to be functional, are obviously subject to contextual variations: different organizations exhibit different requirements with respect to redundancy. But because of the diverse activities which the divisions we sampled engaged in (a total of 45 divisions -- including soil analysis, wildlife conservation, irrigation, animal nutrition, crop promotion, and land settlements), no attempt was made to identify the types of situational redundancies appropriate to each. Rather, we sought measures of general redundancy, i.e., conditions which are necessary for the maintenance of the "success" of any organization, regardless of its specific functional responsibilities. Such general redundancies do permit a comparative examination of different organizations.

Let us consider first the notion of "wealth," the opposite of poverty. The point made by Caiden and Wildavsky about "poor countries" is equally well taken when it is applied to "poor organizations."

Less able to cope with the unexpected, poor countries suffer more uncertainty of an extreme kind, like political instability, than do rich ones. In all these respects rich countries possess what the poor countries miss: the redundancy of men, money, and institutions which let organizations function smoothly and reliably in performing complex tasks... Wealth provides a buffer against the world and its adversities which the poor must face up to personally... Rich organizations are characterized by largesse; they have ample reserves in case anything runs short. They have many ways to do things so that if one fails another takes over.^^

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Wealth permits the emergence and maintenance of the kinds of redundancies in organizations that are necessary for ensuring system reliability, that protect against error through the provision of multiple channels and alternative pathways. It allows for experimentation, for reinforcement, for insurance; it allows organizations to sustain error without being incapacitated -- even to correct error as it is occurring. It provides reserves, contingency funds, etc. -- all to reduce vulnerability. But poor organizations are very vulnerable. They constantly seek ways to make ends meet, often forced to eliminate all duplicate and overlapping functions -- which make them even more vulnerable. It is standard practice for organizations, when faced with large budget cuts or a sudden depletion in resources, to eliminate redundancies in the interest of "efficiency." This easily occurs because conventional management theory and practices teach that all redundancy is wasteful and dysfunctional. And while "rich" organizations rarely foster redundancy deliberately, when redundant structures appear, they are not immediately marked for extinction.

The preceding paragraphs establish the link between wealth and redundancy. But it appears that what one is really interested in is the derivative notion of flexibility, provided by wealth, which equates with organizational redundancy. The first type of general unredundancy that we shall be examining, therefore, pertains to flexibility. One way to examine the amount of flexibility available to an organization is to inspect its budgetary appropriations. We conceive of the budget as consisting of two types of allocations: discretionary, i.e., flexible; and fixed, or non-discretionary, i.e., inflexible. The more flexible the budget, the greater the redundancy of alternatives, the greater the options available to the organization. It is the amount of discretionary allocations, taken as a proportion of the total budget, that is of concern to us. Discretionary allocations afford the organization the maneuverability, the flexibility, that is necessary to reduce and correct error as it arises. In the budgets of Thai agencies, all of whom must follow the same set of standardized budgetary regulations, by far the largest item of the fixed (non-discretionary) budget is personnel costs -- wages, salaries, and other employee compensation. Other items of the line item budget contain some degree of flexibility. Certainly
within line item categories -- office supplies, for instance -- the decision may be taken to purchase more of one supply than another, depending on need. But the same cannot be said of line items comprising salaries, wages, and other employee compensation. These brook no tampering. (In the Thai bureaucracy, "riffs" and layoffs are nonexistent and dismissals almost unheard of.) In this study, therefore, we take as a surrogate for the discretionary budget, the proportion of an agency's budgetary allocation that is spent on items other than employee compensation (salaries and wages). The higher the proportion of the budget that goes toward line items other than salaries, wages, and other employee compensation, the more flexible the organization.

In similar fashion, another indicator of flexibility is the notion of budgetary slack. Budgetary slack operates in much the same manner as organizational slack, defined by Cyert and March as the "presence of resources in excess of what is required to maintain the organization." As Cyert and March tell us,

Organizational slack becomes a cushion: the cushion provided by organizational slack permits firms to survive in the face of adversity... [I]t absorbs a substantial share of the potential variability in the firm's environment...it plays both a stabilizing and adaptive role...[B]y providing a pool of emergency resources, it permits aspirations to be maintained (and achieved) during relatively bad times.

Cyert and March were talking about business firms, but their argument applies equally well, if not more so, to public organizations. By definition, rich organizations are more likely to be characterized by slack than poor organizations. And is it not slack, i.e., excess resources, that permits the presence of duplication, overlap, and other forms of redundancy in an organization?

The concept of slack is readily understood, but its precise measurement is difficult. In this study, we confine our attention to budgetary slack. Organizational budgets that were made available to us were line item. It would, of course, be presumptuous, and silly, to attempt to

13. Ibid, pp. 37-38
infer the presence or absence of slack or "excess" by examining the amounts provided for each line item. Instead, we chose a gross proxy for the concept. The operational definition for budgetary slack in this paper is "the organizational budget, proportional to salaries and wages, that is not tied to any specific line item." In other words, recognizing the pitfalls associated with our choice, we fix upon this part of the budget as a surrogate measure of the amount of slack. One justification for this decision is that for the group of agencies under consideration, the amount of slack in the line item budget is severely restricted owing to budgetary regulations that do not permit transfers between line items once the budget has been approved. Organizations possess a certain amount of discretionary flexibility with respect to expenditure categories within line items; but not across line items. Given such regulations, almost the only flexibility otherwise provided lies in that portion of an organization’s budget that is not tied to a particular line item.

At the time this study was conducted, the entire Thai civil service had made a switch from the traditional rank-pay system consisting of 5 tiers (4 grades plus a special grade) to an 11-level position classification system. Positions were classified in terms of detailed job descriptions. Among the stated objectives of the new system was the improvement of personnel performance by placing appropriately qualified persons in each position and the reduction of duplication and overlap by emphasizing task specialization. Since our research was informed by the principle of redundancy -- a concept at variance with most position classification systems -- we thought it imperative to ascertain the extent to which organizations still retained redundancy of function in their internal work arrangements. According to our theoretical formulation, redundancy of function should be positively associated with organizational performance. This constitutes the second type of general redundancy that we shall be examining.

We observed that the work structures of many organizations were such that whenever officials were absent from their jobs, no one was able to handle their work -- either through lack of prior authorization, or through lack of the requisite skills or information. In either case, work would come to a halt until the officials returned. Quite frequently, this resulted in the
creation of critical bottlenecks, as most tasks consisted of a series of interdependent steps performed by several persons. A hold-up at any point along the line resulted in delays that were often detrimental to organizational effectiveness. In other organizations, by contrast, we observed that tasks were delegated on a routine basis. When officials were away from work, others could and did carry on in their absence.

Intuitively, the presence or absence of such organizational arrangements should have some effect on performance. The concept of redundancy suggests that organizations that have institutionalized procedures for duplicating and overlapping work will perform better than organizations which do not. Based on our observations with respect to organizational differences in delegating work, the proxy measure for redundancy of function that we selected in this study was the degree to which an official's routine responsibilities could be handled by other officials in his absence. The measure applies only to the more senior officials in each organization, on the assumption that the presence or absence of redundancy of function at this level carries more serious implications for organizational performance than it would at lower levels.

Redundancy of function or duplication and overlap permit tasks to be reassigned among staff members whenever necessary, and in such manner as to ensure the success or completion of each individual task in any task sequence. Redundancy of function is equivalent to the application of the principle of disjunction ("task 1 may be completed by A or by B), and, as Simon reminds us, the likelihood of success of disjunctive events is greater than the likelihood of success of conjunctive events. Yet it is this very same principle that personnel classification systems are apt to ignore.

The third type of redundancy that we explored has to do with the relative ease of communications between superior and subordinate officials and the extent to which information is disseminated among staff members within the organization. Our hypothesis is that the greater

the ease of communications and the more unrestricted the flow of information within an organization, the better the performance, other things being equal. The formal, hierarchical properties of public bureaucracies tend, if anything, to act as a constraint on both lateral communications and communications that emanate from subordinates to their superiors. In the Thai bureaucracy, characterized by authority based on hierarchical status, one would expect that bureaucratic norms do not easily foster communications between subordinate officials and their superiors. Communications take on the character of a one-way flow, from the top downward. Given this perspective, the extent to which ease of communications exists must be considered as a facilitator of redundancy of communications channels -- the greater the ease of communications between subordinates and their superiors, the more channels are open. And according to our hypothesis, redundancy of channel, whether achieved by means of the informal organization or through formal, routine operating procedures, is essential for the smooth functioning of public bureaucracies, and indeed, for any large scale formal organization.

In this study, two proxy measures have been selected as surrogates for the extent to which redundancy of communication channels is present in a division. The first focuses on the linkages which permit the upward flow of information between subordinate officials and their superiors, represented by subordinate perceptions of division chiefs' receptivity to suggestions from division staff. This indicator was selected because we did not wish to obtain simply a measure of interpersonal relations. We wished, rather, to gain an idea of the ease of interpersonal communications specifically within the work context, using an example that would be sufficiently familiar to all of the respondents in the sample.

A second measure attempts to assess the degree to which information is disseminated within the organization. We looked at formal, institutionalized procedures that were present within each division, reasoning that the effect of informal networks was already partially incorporated in the first measure. Although all divisions had full staff meetings from time to time, some instituted meetings on a regular monthly basis, whereas others met intermittently or infrequently. We thus selected the number of division meetings that were held each year as a
proxy measure for the degree to which information was communicated to all staff members. In fact, division meetings fulfill more than just the purpose of communicating information -- they serve as a forum where ideas and opinions can be aired publicly, and where issues can be discussed and considered, i.e., a mechanism for redundancy of channel.

To recapitulate, the central theoretical notion which guided the selection of organizational characteristics for empirical observation was the principle of redundancy. Three types of redundancy were identified that would permit a comparative examination of different organizations: flexibility (a derivative of wealth), substitutability of function, and communications. In terms of actual indicators utilized, the following five indicators were included for analysis: the proportion of an agency's budget that is spent on items other than employee compensation and budgetary slack, -- both surrogates for organizational flexibility defined in terms of discretionary allocations; redundancy of function, a proxy indicator of the amount of potential duplication and overlap present in the organization; ease of communications between subordinate officials and their superiors and number of division meetings held last year, -- both representing redundancy in communications channels.

The effect of the five organizational variables on organizational performance was estimated through the use of ordinary least squares multiple regression analysis (see the appendix). All five variables show sizeable coefficients in the regression equation, and corroborate our initial hypothesis concerning the relationship between redundancy-related variables and organizational performance. The greater the redundancy, as measured by the five variables, the better the performance. In terms of the combined effect of the set of variables on organizational performance, represented by the multiple correlation coefficient, R-squared is .34. Which is to say that the five organizational variables together account for thirty-four percent of the variance in performance. We should, however, be careful not to attach too much importance to

the magnitude of the individual regression coefficients. They are at best crude indicators of certain kinds of constructs pertaining to properties of organizations, and they still contain a rather large, though not unacceptable, degree of measurement error.

**Bureaucrats’ Characteristics and Organizational Performance**

The second purpose of this paper is to compare the preceding conceptual approach with the "dominant hypothesis" in the field of development administration. The dominant hypothesis contained in socio-cultural explanations is expressed by the Parsonian pattern variables, which consist of five dichotomous polarities: ascription/achievement; particularism/universalism; affect/affective neutrality; diffuse/specific; collectivity/individual orientation. These pattern variables "are inherently patterns of cultural value orientation (which) become integrated both in personalities and social systems."

Political scientists writing in the field of development administration have adhered surprisingly closely to sociological/anthropological formulations, explaining bureaucratic and organizational performance in terms of culture and personality. In the development literature, the Parsonian pattern variables (or variant formulations) have become standard axioms, so much so that in summarizing the central concepts in development administration, LaPalombara writes:

> [T]he role of bureaucracy in effecting socio-economic-political change is said to require, as central tendencies, such Weberian attributes in public administration as hierarchy, responsibility, rationality, achievement orientation, specialization and differentiation, discipline, and professionalization. Insofar as public administrative systems fall short of this Weberian rational-legal model, they are said not to be modern.

At a general theoretical level, such approaches are perhaps best exemplified by the work of Riggs. Selecting three of the pattern variables to be of primary importance, Riggs claims:

> A significant tendency exists for action in traditional societies to be predominantly ascriptive, particularistic, and diffuse; whereas choices in modern societies are more likely to be achievement oriented, universalistic, and specific.

As conceptual categories, the pattern variables, used so often to distinguish tradition and modernity, appear to be quite useful. But serious problems attend the connotations that attach to the terms traditional and modern. Modernity connotes rational behavior which, in turn, is equated with effectiveness. Hence, modernity has become synonymous with efficient performance. By contrast, traditional systems are perceived to be ineffective and inefficient.

In the works of Riggs and LaPalombara, this conclusion is quite evident: said simply, the more traditional the organization, the less efficient, and the more modern the organization, the more efficient. Indeed, this generalization has informed the majority of studies that have examined bureaucracies in the LDCs.\(^\text{19}\)

Writings on the Thai bureaucracy stress the essentially non-legal rational character (in the Weberian sense) of decisionmaking. Value orientations of civil servants are said to be largely traditional, i.e., they are particularistic, affect-based, and non-achievement oriented. Norms that emphasize secular rationality, functional performance, and innovation are absent.\(^\text{20}\) A causal nexus is assumed to exist between value orientations and bureaucratic performance (a common assumption of comparative politics as well) — to the extent that values are held to be the primary determinants of performance. The more modern the value orientations (or behaviors) of individuals in organizations, the more effective the organizational performance.

The preceding statements have not been seriously challenged in the literature on development administration. They have been so universally accepted as to have gained almost axiomatic status. But because a hypothesis is generally accepted as true does not mean it is true. The truth value of any hypothesis rests upon empirical evidence. If the "dominant hypothesis" is true, one would expect to find a positive association between "modernity" value


orientations and behaviors and organizational performance. Our research effort was designed to test this association.

Three composite measures were constructed to differentiate among organizations along a traditional-modernity continuum, using criteria derived from Weberian notions of legal-rationality (as expressed by the pattern variables). The first measure reflects value orientations with respect to achievement norms. The second measure is concerned with actual behaviors in three different types of decision situations -- behaviors specified to be more modern or less modern (traditional) following the logic of pattern variable formulations. The third measure represents the extensiveness of patron-client networks -- although the presence of patron-client networks is by no means unique to traditional and transitional organizations; in the development administration literature, such networks are seen as representative of ascriptive, particularistic, and affect-laden norms, and hence as detrimental to effective organizational performance. 21

The question which concerns us now is: To what extent do value orientations, behaviors (assessed along a traditional-modernity continuum), and ascriptive and affect-laden norms (as represented by patron-client networks) affect the performance of an organization? The same procedure that was used to estimate the effect of organizational variables on organizational performance was employed with respect to the estimation of the effect of bureaucrats' characteristics on organizational performance, i.e., the estimation procedure consists of ordinary least squares multiple regression analysis. Mean scores were obtained for each of the 45 divisions in the sample to represent individuals at the aggregate level of the division. We note that whereas inferences about the characteristics of individuals cannot be made from aggregate data -- (the ecological fallacy) -- the reverse case where inferences are made at the aggregate level

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21. A full description of these measures can be found in Suchitra P. Bhakdi, op. cit., Chapter 4 and appendices B and C. Value orientations is a composite measure composed of 4 indicators. Modernity behaviors is comprised of 3 indicators; and patron-client networks is comprised of 2 indicators. For the construction of the three scales, a maximum likelihood procedure for analysis of covariance structures proposed by Jöreskog is employed. This method produces consistent estimates for unobservable variable models and permits computation of the standard errors of the estimated parameters. Cf., Karl G. Jöreskog, "A General Method for Analysis of Covariance Structures," Biometrika, 57 (1970), pp. 239-251.
based on individual data is, however, permissible. In our analysis, two aggregate divisional scores were constructed for each of the three composite variables (value orientations, behaviors, and patron-client ties). The first score represented higher ranking officials (level 4 and above); the second represented lower ranking officials (level 3 and below) for each division. The assumption here is that position classification level makes a difference -- the creation of two separate scores on each variable permits a separate estimation or assessment of the relative influence of each group of officials on the performance of the organization as a whole. The regression estimates are reported in the appendix.

The results of the multiple regression analysis show clearly that, contrary to what the development administration literature would have us believe, the set of variables that we selected for testing accounts for only nine percent of the variance in organizational performance. If personality/culture theories in development administration are in fact true, we should find a much stronger relationship between the three composite variables and organizational performance. Furthermore, although the signs on the coefficients are in the expected direction according to the theoretical formulation, i.e., modernity value orientations and behaviors show a positive association with performance, and patron-client ties show a negative association, the coefficients themselves are very small and the standard errors so large (all but one are larger than the coefficients themselves) that one could not make any substantive interpretation as regards what the coefficients "really mean." That the association proves to be so weak must indeed be considered surprising.

Assessment of Competing Hypotheses: Bureaucrats' versus Organizational Characteristics

On the basis of field research conducted in 45 divisions of the Thai bureaucracy, we find that redundancy-related organizational characteristics account for one-third of the variance in organizational performance. By contrast, Parsonian-type variables having to do with bureaucrats' attitudes and behaviors account for less than one-tenth of the variance in performance. Here we have been comparing the results of two separate sets of regression estimates. In multiple regression analysis, however, a stronger test for examining two competing hypotheses is
not simply to perform two separate multiple regression analyses and compare the results, but to estimate in addition a third equation which contains all the variables from both the first and the second equation. These variables are treated as independent or explanatory variables. One then proceeds to test whether *dropping* first one set, then the other, from the equation makes any difference in terms of the explanatory power of the model.\(^\text{22}\)

Accordingly, we first tested the "null hypothesis" -- that organizational variables have *no effect* on performance -- by dropping these variables from the equation. Given the statistical results, we were forced to reject the null hypothesis that redundancy related variables have no effect on organizational performance.\(^\text{23}\)

In the same manner, we tested the null hypothesis that bureaucrats' attitudes and behaviors had *no effect* on performance by dropping this set of variables from the equation. Unlike the case with the organizational variables, the statistical results *fail to reject* the null hypothesis.\(^\text{24}\) In light of the empirical evidence, we fail to reject the hypothesis that bureaucrats' attitudes and behaviors have no effect on organizational performance.

In summary, then, we have presented the results of an empirical study which demonstrate that redundancy related organizational properties are linked to (i.e., can "explain") organizational performance, whereas Parsonian type variables have no effect on performance. Of course, it is too much to say that *no* bureaucratic attributes are of importance in explaining differences in the performance of an organization. Indeed, by experimentation, we found that mean length of time in the civil service of senior officials (level 4 and above) and the educational attainment of junior officials (level 3 and below) both have a direct statistical association with performance. The explanation is intuitively obvious. Mean length of time in the civil service may be viewed as a surrogate for work experience. Other things being equal, divisions

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23. F is computed as 4.26. The significance limit at the 1 percent level for F(5,34) is 3.61, so we reject the null hypothesis.
24. F is computed as 1.05. The significance limit at the 5 percent level for F(6,34) is 2.38, so we fail to reject the null hypothesis.
with more experienced senior officials tend to perform better than divisions with less experienced officials. The second variable, educational attainment, is probably a surrogate for technical skills. It hardly comes as a surprise that, other things being equal, divisions with higher levels of technical skills tend to perform better than divisions with lower skill levels. And when length of time in the civil service and educational attainment are added to the five redundancy related organizational variables, the total set accounts for almost half the variance in organizational performance (R-squared is .46).  

Concluding Remarks

It goes without saying that until the research findings reported here have been confirmed through replicative studies, they should not be taken as incontrovertible proof. But they should be treated for what they are: exploratory and highly suggestive of the direction which future research might take. The results of this exploratory research lead to two general conclusions. First, the performance of organizations is appropriately explained in terms of theories of organizational structures and properties that are not tied to the personalities of organizational actors. In this paper, redundancy related organizational properties are linked to organizational performance, and the strength of association is such that the five variables selected for testing jointly account for approximately one-third of the variance in performance. Second, the research indicates that personality/culture explanations, as contained in the pattern variable formulations, have little power in explaining organizational performance. In fact, the evidence leads us to reject pattern variable theories in favor of organization theories informed by the concept of redundancy. In the field of development administration, at least, we have thus far been guided in our thinking by a mistaken set of theoretical assumptions.

25. The fact that this finding pertains to officials of junior rank (level 3 and below) but not of senior rank (level 4 and above) is not surprising, given the fact that there tends to be little variance in educational levels among more senior officials. Also, we should assume that the relationship between educational level and technical skills is more pronounced at the lower end of the educational scale than at higher levels. Differences in technical skills are probably greater between individuals with one or two years of schooling beyond high school and those with a high school diploma only, than they are between individuals with five or more years of college as opposed to only four years of college.

26. Regression coefficients are given in the appendix.
1. Organizational Characteristics as Determinants of Organizational Performance

Five organizational characteristics that are linked to redundancy are entered as explanatory variables in the equation for organizational performance. The organizational unit of analysis is the division. The variables are: discretionary allocations, budgetary slack, work overlap (work handled in absence), superior's receptivity to suggestions, and number of divisional staff meetings last year. Ordinary least squares regression estimates are given below. All variables have been re-scored to a 0-1 scale to facilitate interpretation. As usual, coefficients on variables appearing on the right-hand side of the equation represent the number of percentage points change in the dependent variable that are associated with a unit (one hundred percentage points) change in the respective independent variable.

\[
\text{Performance} = 0.053 + 0.119(\text{Disr Alloc}) + 0.166(\text{Slack}) + 0.158(\text{Sup Receptvty}) \\
+ 0.153(\text{Divsn Meets})
\]

where

- \text{Disr Alloc} = \text{Discretionary Allocations}
- \text{Slack} = \text{Slack}
- \text{Sup Receptvty} = \text{Superior's Receptiveness to Suggestions}
- \text{Redund Functn} = \text{Redundancy of Function}
- \text{Divsn Meets} = \text{Divisional Meetings Last Year.}

R-squared is equal to .34.

1. Details on scoring procedures for all the variables in this appendix are reported in Suchitra P. Bhakdi, \textit{op. cit.}, appendices B, C, and E.
All of the organizational variables that are hypothesized to influence performance show sizeable coefficients in the regression equation. The standard errors are not as small as one might wish, but they are still acceptable. For the purposes of this paper, however, one is properly interested in R-squared, the multiple correlation coefficient, rather than in the individual coefficients. This is because one is interested in estimating the differential effect of two sets of variables on organizational performance. In the preceding equation, we estimate the effect of organizational properties on organizational performance, and R-squared is .34. In other words, this particular set of organizational characteristics, all of which are derived from redundancy theory, account for approximately one-third of the variance in performance.

2. Bureaucrats' Characteristics and Organizational Performance

Here one wishes to test the effect of bureaucrats' attitudes and behaviors on organizational performance. Three composite variables, selected in accordance with Parsonian-type formulations in the development administration literature, are entered into the right-hand side of the equation. Each variable is split into two: the first represents senior officials (level 4 and above); the second represents junior officials (level 3 and below). The variables are individual level observations that have been aggregated to the divisional level. Variable scores therefore represent mean scores of the individuals in each division (weighted to the total population). After averaging the scores, there is not enough measurement error left in the independent variables to bias the estimates.²

The three explanatory variables are: value orientations, modernity behaviors, and patron-client networks. Regression estimates, in which all variables have been re-scored to a 0-1 scale to facilitate interpretation, are given next.

² Measurement errors (σ²) on individual level variables are given in Suchitra P. Bhakdi, op. cit., appendix D. The error for the mean is simply σ²/n.
\[
\text{Performance} = 0.426 - 0.099(Pat-Client, Sr) - 0.100(Pat-Client, Jr) + 0.049(Mod Bhvr, Sr) \\
(0.127) (0.170) (0.163) (0.138) \\
- 0.140(Mod Bhvr, Jr) + 0.297(Values, Sr) + 0.094(Values, Jr) \\
(0.169) (0.208) (0.171)
\]

where

\begin{align*}
\text{Pat-Client, Sr} & \quad \text{Patrons-Clients, senior officials (level 4+)} \\
\text{Pat-Client, Jr} & \quad \text{Patrons-Clients, junior officials (levels 1-3)} \\
\text{Mod Bhvr, Sr} & \quad \text{Modernity Behaviors, senior officials} \\
\text{Mod Bhvr, Jr} & \quad \text{Modernity Behaviors, junior officials} \\
\text{Values, Sr} & \quad \text{Value Orientation, senior officials} \\
\text{Values, Jr} & \quad \text{Value Orientation, junior officials}
\end{align*}

R-squared for this set of variables is .09.

Note that R-squared for this equation is only .09. Moreover, although the signs on the coefficients are in the expected direction, the coefficients themselves are so small, and the standard errors so large as to render futile any meaningful interpretation. Admittedly, we might be able to reduce some of the standard errors by dropping some of the variables in the equation. We did not proceed with further analysis, however, because our primary intention was to compare R-squared on this set of variables with R-squared on the set of variables which represented organizational properties. The fact that R-squared for the set of variables representing bureaucrats' characteristics is so small provides sufficient grounds for doubting the correctness of Parsonian-based theories as they pertain to organizational performance.\(^3\)

3. Determinants of Organizational Performance

The final equation given here contains 7 exogenous variables: the 5 already present in the equation for organizational properties as determinants of organizational performance (section 1 of this appendix), and 2 additional variables. The additional variables are: mean years in civil

\(^3\) F-test on each coefficient shows lack of significance.
service for senior officials (level 4 and above), a surrogate for work experience; and mean educational level for junior officials (levels 1-3), a surrogate for technical skills. The regression estimates reported here were arrived at after a series of trials in which a number of different variables pertaining to bureaucrats' characteristics (e.g., socioeconomic status, family background, respondent's sex, education abroad, etc.) were entered into the right-hand side of the equation for organizational performance but were subsequently dropped on the basis of lack of significance.

All variables in the following equation have been re-scored to a 0-1 scale. Note that R-squared is .46. That is, the variables in the equation together account for forty-six percent of the variance in performance.

$$\text{Performance} = -0.207 + 0.100(Dscr\ Alld) + 0.101(\text{Slack}) + 0.124(\text{Sup\ Rcprvty}) + 0.258(\text{Redn\ Fnctn})$$

$$+ 0.221(\text{Divsn\ Meets}) + 0.326(\text{Yrs\ Service, Sr}) + 0.224(\text{Ed\ Level, Jr})$$

where

- $Dscr\ Alld$ = Discretionary Allocations
- $\text{Slack}$ = Slack
- $\text{Sup\ Rcprvty}$ = Superior’s Receptiveness to Suggestions
- $\text{Redn\ Fnct}$ = Redundancy of Function
- $\text{Divsn\ Meets}$ = Divisional Meetings Last Year
- $\text{Yrs\ Service, Sr}$ = Years in Civil Service, senior officials (level 4+)
- $\text{Ed\ Level, Jr}$ = Educational Level, junior officials (levels 1-3).
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