Although power is a major concern of organization theory, little research has focused on the horizontal dimension of power between organizations at relatively equal hierarchical levels. This study attempts to fill that void by operationalizing organizational power for 127 federal government agencies. The derived measure is subjected to tests for internal and external validity by empirically testing one promising theory of agency power.

MEASURING ORGANIZATIONAL POWER Resources and Autonomy of Government Agencies

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Since the writings of Max Weber, power has been a concept of central concern to students of bureaucracy (March, 1955; Thompson, 1967; Kahn and Boulding, 1964; Scott and Mitchell, 1972; Rourke, 1976; McNeill, 1978). Political scientists also regard power, both interorganizational and interpersonal, as a central concept in political analysis (Dahl, 1957, 1968; Shapely and Shubik, 1954; Simon, 1957; Riker, 1959, 1964; Parsons, 1966). Despite the attention devoted to this concept by a variety of scholars, the literature on power has two serious voids. First, the major theories (Hickson et al.,

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1971; Blau, 1964) and research (Cotton, 1976) have focused on interpersonal power (usually within a single organization). Without reifying the organization, one can argue that power is a useful concept to describe the relationship between organizations.[1] Lockheed Aircraft, for example, is dependent on the Defense Department as the sole market for many of its products. Clearly a power relationship exists between these two organizations. Second, the literature's focus has been on the vertical dimension of power (e.g., Tannenbaum, 1968), to the neglect of the horizontal dimension (Landsberger, 1961). Vertical power concerns the relationship between individuals at different levels of hierarchy, while horizontal power concerns power relationships between individuals or between organizations at the same level of hierarchy.

This paper will address the horizontal dimension of organizational power through a study of 127 government organizations. First, it offers a definition of power relevant to government agencies, yet consistent with some past research on interpersonal power. Second, "agency power" will be operationalized for these agencies, focusing on the measure's internal and external validity. Third, as a portion of the external validity argument, the measure of agency power will be used as a dependent variable to test Rourke's (1976) theory of bureaucratic power. This test will illustrate the empirical import of the developed measure.

POWER AND GOVERNMENT BUREAUCRACIES

That government bureaus exercise power (in political or sociological terms) is accepted by most students of government organizations (Warwick, 1975; Rourke, 1976). In political terms, power may be defined as the ability to make decisions that affect the distribution of societal values (Easton, 1965; Lowi, 1969). Government bureaus, by participating in the policy making process, regulate corporate behavior, interpret tax laws and other vague statutes, operate massive transfer

payment programs, stimulate and guide most scientific research, and provide options for national defense, among other functions (Kohlmeier, 1969; Woll, 1977;. Redford, 1969; Steiner, 1966; Lambright, 1976; Allison, 1971). By implementing policy, by proposing new policy alternatives, by clarifying the legislative intent of policy, and by enforcing policy established elsewhere, government bureaus authoritatively allocate scarce societal values (Easton, 1965)—and that is power.

Within the sociological definition of power, government agency activities also create dependence relationships for others. We need only note the vast government regulation of individual and corporate behavior as an example of the dependence relationships between government bureaucracies and ourselves as citizens. The Internal Revenue Service, by its decision to audit or not audit tax returns, makes us dependent on it. The Interstate Commerce Commission determines the price we must pay for nonair transportation. The list of individual dependencies on government bureaus is endless.

Given the exercise of power by government bureaus, can this phenomenon be measured? Many scholars have grappled with the concept (Dahl, 1957, 1968; Simon, 1957; Riker, 1959, 1964; Parsons, 1966; March, 1955) and have failed to reach a consensus on either the meaning of power or the concept's utility. Despite the lack of consensus, the voluminous research on power provides some insights useful in developing a measure of agency power. According to Robert Dahl (1957: 203) power is a relational concept, meaningful only in comparative references. To rank actors or agencies, therefore, on the basis of power requires that each agency interact with the same set of individuals in relatively similar activities so that their actions can be compared.

Power must be understood not only as a relational concept but one with two necessary components. For any organization, including government organizations, to exercise power, it

must have two things: resources and discretion in the use of those resources. The sine qua non of bureaucratic power is access to resources—money, personnel, legislative authority, and other tools necessary to make and implement decisions. Without such resources, an organization ceases to exist (Katz and Kahn, 1966). One agency, therefore, is more powerful than another if it can extract more resources form its environment.

The resources component of power relates directly to dependence on other institutions. Only Congress and the President can grant these agencies their needed resources. Because every agency is more or less dependent on these same actors for resources (comparability), the relative ability of one bureau to extract resources and, thus, lessen its dependency, can be compared to the ability of other bureaus.

Access to resources or rather the ability to extract resources is not sufficient to create power for a bureau. The National Institutes of Health (NIH) and the Social Security Administration (SSA) are both successful in extracting resources from their environments, but the SSA's power is a mere shadow of that exercised by the NIH. The difference is discretion. The NIH is relatively free in its policy spheres of influence to decide priorities and pursue its own defined goals; the SSA, on the other hand, is rigidly bound by rules and legislation passed by a Congress intent on restricting the scope of its discretion (Steiner, 1966; Schick, 1971). Discretion, therefore, is in part the agency's dependence on other organizations.

Resource extraction and discretion in the use of resources after extraction are two separate dimensions of agency power. An agency can have an abundance of resources with little discretion, as the Social Security Administration does, or have few resources, but a great deal of discretion, as the Internal Revenue Service does. A lucky agency may have both, as in the case of the NIH, or be so unfortunate, as was the Selective Service Commission in the mid-1970s, to have neither. This research is concerned with tapping the variation in power possessed by government agencies to determine

which agencies can operate as relatively free from restrictions of law or supervision and also have significant societal resources at their disposal.

THE AGENCIES

The population for this study of organizational power is all operating agencies of the federal government that were in existence from 1970 through 1975 and employed at least 200 people. These criteria exclude coordinating organizations, temporary organizations, and agencies too small to be of major concern to either the Congress or the President. A total of 127 agencies were included in this study.

MEASUREMENT: THE DEPENDENT VARIABLE

Measuring any variable as complex as power (of resources and autonomy) requires the development of measures that are both valid and reliable. A measure is reliable if a given property is measured for a given individual several times with similar results (Crano and Brewer, 1973; Blalock, 1968). Too often, however, in pursuit of reliable measures, the question of validity is ignored. Validity has two aspects: internal validity and external validity (Crano and Brewer, 1973; Campbell and Fiske, 1959). Internal validity, simply stated, is whether or not the variable measures what it is supposed to measure. External validity means that the measure is empirically correlated to other measures that are linked to it by theory. To create reliable and valid measures of resources and autonomy, this study will use one measurement technique to create the measures and another to assess the measures' validity.

To operationalize resources and autonomy, one must assume that some theoretical-level concept equivalent to each variable exists. Because directly measuring such concepts as resource extraction and discretion is impossible, a series of operational indicators must be logically related to the under-

lying concept. Each indicator taps some portion of the concept, but none of the indicators is a perfect measure (Torgerson, 1958). The indicators will then be combined to cancel out the measurement errors.

RESOURCES

Because any volume of resources that does not grow will eventually become a constraint, our six indicators of resource attraction focus on growth rather than size. "Congressional budget growth" is the percentage rate that Congress permits the agency's budget to grow from year to year (this study uses 1970-1976). This single measure is a good representation of overall budget growth, as it is strongly related to avoiding budget cuts and garnering presidential support. Neither the presidential growth rate nor the congressional cut rate add much additional information.

Growth in dollars amounts, however, is often meaningless to a bureau without a corresponding "growth in personnel." To build a powerful organization and expand program content, bureaus need additional personnel as well as funds. An indicator of the growth in perquisites is agency "growth in supergrade positions." By adding additional positions at the GS 16-18 level, promotion opportunities expand for the personnel in the bureau, permitting it to attract quality personnel and to retain administrators who might otherwise leave. "Growth in the number of executive positions" taps the same dimension as supergrade growth but at a higher level.

"Supplemental appropriations" are special requests to Congress for funds to cover deficiencies, noew programs, and unexpected expenses. A bureau confident of supplemental appropriations can act positively and know that its actions will be sanctioned at a later date. As an indicator, the total number of supplemental appropriations granted from 1974 to 1976 was used. The final indicator of resources is "new legislation." Agencies that are granted their requests for new

legislation are able to expand their sphere of influence. The indicator is a measure of the number of new pieces of legislation that the agency requested and received.

AUTONOMY

Autonomy is more difficult to measure; therefore, the indicators of autonomy will be more controversial than those for resources (see Price, 1972 for an attempted catalog). One indicator of autonomy is an agency's dependence on the appropriations process; independence in this instance means that the budget is not affected by major changes in the political environment (Bozeman, 1977). One way to independence is through "permanent authorizations." These allow agencies to spend money over long periods of time rather than over the traditional one or two years. Permanent authorizations free the agency from the annual authorization process and, therefore, from dependence on Congress' substantive committees. The variable used as an indicator of autonomy is the percentage of the agency budget that is protected by permanent authorizations.

A second facet of autonomy is budgetary discretion. The first indicator of budgetary discretion is the degree that Congress requires detail in an agency's budget. An agency such as the Army Corps of Engineers must include in its budget submission every program and project that the agency administers, while other agencies' budgets are devoid of detail. "Budget detail" is the ratio of the agency's budget size in dollars to the number of pages the budget takes in the *Budget Appendix*.

A second measure of budgetary discretion is the extent of agency "reprogramming." This means nothing more than transferring funds from one program to another. Although the extent of reprogramming is difficult to discern, one can measure the tip of the iceberg by comparing program by program budget estimates with the actual expenditures a year later. This measure of reprogramming will miss within cate-

gory shifts and, therefore, underestimate the extent of reprogramming by an agency, but it is currently the only reprogramming measure available.

The final indicators of bureau autonomy are "rulemaking" and the "rules to laws ratio." Because most legislation is vague, agencies must issue rules and regulations to clarify the intent of Congress and to establish public policy guidelines. Two crude measures of legislative autonomy are the number of rules the agency has issued and the ratio of the number of pages of rules the bureau issues to the number of pages of substantive legislation that applies to the agency.

None of the indicators of resources or autonomy perfectly measures these variables. For this reason several indicators of each are used. Each indicator captures only a portion of the concept; the remaining portion of the indicator is error. To measure resources and autonomy, a technique is required that captures what the indicators have in common. (Measurement theory assumes that the common element represents the underlying variable.) The appropriate technique for extracting this commonality is factor analysis (Heise, 1975; Levine, 1977); therefore, using classical factor analysis, two indexes representing the ability to extract resources[2] (resources for short) and autonomy[3] were created.

Because the concepts of resource extraction and autonomy do not have a long history of use and the indicators used here are at best imperfect, the internal validity of the measures should be analyzed (the nature of the measures insures acceptable reliability). To assess validity, another measure of each independent variable is needed—preferably a measure constructed by a totally different method. One possible procedure for constructing such a measure is the elite opinion method, whereby individuals with a great deal of knowledge about the agencies rank them on the dimensions of resource extraction and autonomy. Because experts able to rank all 127 federal agencies do not exist, a subset of agencies (20 bureaus within the Department of Agriculture) was used in this test.

The survey panel was composed of 29 persons with expertise in agricultural policy but who were not employees of the Department of Agriculture. The panel included 19 academics from several disciplines who have written in the area, 4 prominent interest-group representatives of the leading general farm organizations, and 6 congressional staff members serving the 4 committees most concerned with agricultural policy. Of these, 22 returned surveys—15 academics, 5 staff members, and 2 elite interest group members. Each individual rated the 20 bureaus in the Department of Agriculture on the dimensions of resources and autonomy.

The experts' perceptions were averaged and compared to the agency scores developed by the factor index method. For resource extraction the two measures are positively correlated at .53—good but not exceptional validity. For autonomy the measures are positively but weakly correlated (f = .17), a not unexpected result given the problems of this concept.

Although the tests for internal validity do not show strong results, reasons other than inadequate internal validity might be the cause. First, the elite opinion measure is flawed. The expert panel was rather hesitant to rank agencies, pleading lack of sufficient knowledge about all 20 agencies. The problem, as a result, might be with the elite opinion measure rather than the factor index. Second, because this is an exploratory effort and the internal validity coefficients are positive, a full examination of the measure requires us to proceed with the analysis of external validity.

To do so, an index of agency power must be created, as this paper is concerned with bureaucratic power rather than an agency's ability to extract resources and its autonomy in the use of those resources. An agency has power if it has both resources and autonomy; having one without the other is rarely beneficial for the agency. This theoretical relationship suggests that power is a product of the bureau's resources and its autonomy in the use of those resources. The bureaucratic power measure used in the remainder of this paper, therefore,

will be the product of the resources and the autonomy measure.[4]

INDEPENDENT VARIABLES

Francis Rourke (1976) presents a theoretical argument that bureau power, as defined here, is a function of the bureau's clientele support, its expertise, its leadership, and its cohesion. To measure these variables, the same approach as used above—creating a series of indicators for an underlying concept—will be used. These indicators will be combined via factor analysis to create measures of the variables. Because these concepts are of substantive interest to students of organizational power, the indicators will be discussed in detail.

Clientele. A good set of indicators for clientele support would cover the spectrum from diffuse public support (e.g., public opinion) to specific interest-group support. As an indicator of diffuse public support, the percentage of the population supporting increased governmental expenditures for an agency's functional areas was used.[5] For a series of more specific clientele measures, the House Appropriations Committee hearings for fiscal years 1974-76 were content analyzed. The variables gathered for each bureau include the number of groups testifying for the bureau, the number of congressmen testifying for the bureau, the intensity of the group support,[6] the intensity of congressional supporters, and the percentage of support from mass associations, peak associations, and single petitioners.

An additional indicator of clientele intensity was created by calculating the ratio of groups that appear to testify personally to those that sent written testimony under the assumption that personal appearances indicate greater commitment because greater effort is required. As an indicator of clientele dispersion, the percentage of agency personnel stationed outside the Washington metropolitan area was used; we assumed

that personnel distributions roughly reflect clientele distributions. The final clientele indicator was a dummy variable indicating whether or not the agency had the ability to contract for services or products. As the Defense Department has convincingly demonstrated, contracting is a good way to attract agency clientele. The 11 indicators of clientele support were combined into a single index of clientele support.[7]

Expertise. The expertise measure is a function of six indicators. The first indicator, the number of personnel employed, illustrates a bureau's potential for specialization. The larger a bureau is, the more it can specialize its employees by breaking tasks into smaller components (Weber, 1946). Two indicators of technological capacity were also used in the measure—first, whether or not the agency had in-house research capabilities and second, the number of computers used by the agency. Finally, three indirect measures of professionalism were used. Because professionals are among the higher paid members of any bureaucracy, the number of professionals in a given agency should be positively correlated with the average GS rating for the agency and the percentage of agency personnel who hold higher civil service ratings (GS 14+). In addition to these two indirect measures of professionalism, the final measure of professionalization is whether or not the bureau chief is a scientist in the agency's area of activity. The six indicators of expertise were combined to create a single measure of expertise.[8]

Leadership. Indicators of leadership rely solely on variations in the bureau chief's career patterns. Careers were content-analyzed for information on level of education, employment by Congress, employment by the President, employment in private business, employment by an academic institution, whether the person came up through the ranks in the agency, the person's length of service as a bureau chief, and whether or not the person was listed in *Who's Who.* These

eight indicators create a factor measure that reflects three major career patterns—the civil servant who joins the organization early and remains there for an entire career, the professional who develops expertise outside government and enters the agency near the top, and the politician who is appointed to the position as a political reward.[9]

Cohesion. The indicators of cohesion focus on the bureaucrat's contentement with the organization as demonstrated by the most visible indicator of that contentment, turnover. For regular employees, indicators of cohesion were the voluntary separation rate and the average percentage of agency positions left vacation every month for 1974-1976. Two similar indicators were created for agency leaders, one for turnover and one for vacancies. One more direct indicator of vital performance is the percentage of the agency's supergrade employees who are listed in *Who's Who in Government*. This recognition should be positively correlated with perceptions of performance outside the agency. The five indicators of cohesion were combined to create a single measure of cohesion.[10]

EMPIRICAL ANALYSIS

Francis Rourke's (1976) theory contends that agency power is the function of clientele support, agency expertise, agency leadership, and organizational cohesion. This statement can be represented by the diagram in Figure 1 where each independent variable is causally linked to agency power. As we are unconcerned about the relationships between the independent variables, these relationships are unanalyzed in the model and depicted in the figure by curved lines.

The model generally conforms to the assumptions of path analysis (Land, 1969; Asher, 1976). The relationships are linear, the causal sequence is specified, the measures are interval, and an examination of the data does not reveal

TABLE 1
The Impact of Clientele, Expertise, Cohesion, and Leadership on Bureau Power

Independent Variable	Total Impact	Direct Impact
Clientele	.40	.33
Expertise	.31	.24
Cohesion	.33	.32
Leadership	.24	.18
	R = .60	

correlated errors or heteroscedasticity. Using the techniques of path analysis, two sets of parameters can be estimated. First, the direct impact of each independent variable on bureau power can be estimated; the direct impact of a variable is the impact that that variable alone has on the dependent variable when all other independent variables are held constant. The second set of parameters to be estimated is the total impact of each independent variable. Total impact is both the direct impact of the variable plus the indirect impact the variable has on the dependent variable through the other independent variables.

Table 1 presents the regression estimates of the two sets of parameters for the model in Figure 1. The predictive ability of the model is good (R = .6) with all independent variables showing a positive but moderate impact on bureau power. The estimates of direct and total impact are similar in magnitude. This results because the independent variables are only weakly correlated. Clientele support and cohesion show the strongest direct impacts on agency power. The total impact on clientele support is greater, but some of this impact is indirect through expertise. Cohesion's impact is almost entirely direct and unaffected by the other variables. Expertise has the third-greatest

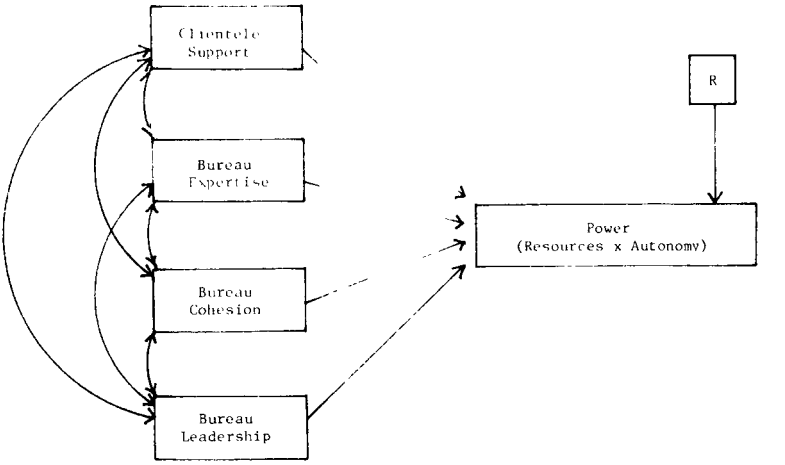

Figure 1: Path Analysis of Rourke's Theory of Bureau Power

direct impact, with some indirect impact through clientele support. Although leadership appears to be the weakest influence, it still has a significant direct impact (and some indirect impact through cohesion).

Examining the relationships between the independent variables and the two components of agency power (resources and autonomy) reveals some interesting findings.[11] Clientele support and expertise have a major impact on agency autonomy with almost no impact on resource extraction. This finding is not unexpected, as political support and technological superiority are two of the primary reasons Congress grants autonomy to an agency. Leadership and cohesion, on the other hand, have a major impact on resource extraction but do not affect an agency's autonomy.

The findings suggest a slight modification of Rourke's theory of bureaucratic power. Although clientele, expertise, cohesion, and leadership all lead to enhanced bureau power, they do so through different paths. An agency with ample resources that desires greater autonomy should attempt to build its clientele support and develop policy expertise.

Agencies that have autonomy but lack resources require leadership and cohesive personnel. Attempts to increase resources by building clientele or developing expertise will probably not succeed. Increasing autonomy without clientele support or expertise may also be futile.

DISCUSSION

Despite the moderate-to-weak internal validity of the agency power measures, the measures appear to have good external validity. Not only is agency power correlated with clientele support, expertise, leadership, and cohesion, but all the relationships are positive, as Rourke's theory predicts. Clearly the results are strong enough to suggest that future research along similar lines will be fruitful. The most obvious focus for scholarly activity is on the measures themselves, in order to refine them and provide new tests for internal validity.

A second promising avenue of research is the application of these findings to the literature on controlling bureaucracy in a society. Although this subject is beyond the scope of this paper, some of the more obvious points should be mentioned. The autonomy of government agencies is a result of strong clientele support and agency expertise. These causes cannot be limited by either Congress or the President, the citizenry's main tools for controlling bureaucracy. Because agencies administer programs and dispense benefits, they can attract clientele support regardless of congressional or presidential action—witness the successful attempt of the Army Corps of Engineers and the Bureau of Reclamation to resist President Carter's 1977 cutback in water projects, which the agencies accomplished by mobilizing their clientele. Expertise is also difficult to counter. Even with Congress' attempt to develop in-house expertise through the Office of Technology Assessment, the Congressional Budget Office, and others, Congress must still rely on agency information for most of its decisions.

Resources, being a function of leadership and cohesion, are more subject to presidential and congressional control.

Both institutions can affect the leadership of an agency as they participate in the selection process. Unfortunately for this factor, however, the resource controls of Congress and the President have been severely weakened by uncontrollable spending. Uncontrollable spending (Social Security is a good example) represents a government commitment to spend money in the future that is limited only by the number of people who qualify. Without passing new laws, spending in these areas cannot be controlled. Estimates of the portion of the federal government's budget that is uncontrolled run as high as 75%. Even with the ability to control leadership selection, Congress and the President may not be able to restrict agency resources. In combination, these findings paint a pessimistic picture for anyone seeking to control bureaucracy.

A third promising area of research is the empirical specification of Rourke's theory. Regulatory agencies, for example, are perceived as weak agencies. Given an adequate data set, this approach can determine if regulatory agencies are indeed weak and, if so, why. Similar research needs to be done on defense and foreign policy agencies, distributive agencies, and redistributive agencies.

SUMMARY

This research was an attempt to measure organizational power for 127 federal government agencies. After separating power into its two components, resources and autonomy, measures of each component were derived by constructing indexes from several indicators. The measures proved to have low to moderate internal validity but good external validity. The measure of agency power was used in an empirical evaluation of Francis Rourke's theory of agency power, where power is a function of leadership, clientele, cohesion, and expertise. The measurement of power in this research was then related to promising future areas of research.

NOTES

1. Although organizations technically cannot act (only people can), treating organizations as actors often permits one to analyze certain questions. This is useful because the people occupying positions of leadership in an organization often change, yet the organization continues. Our generalizations about organizations can be interpreted as the actions of individuals occupying leadership positions who are acting in the name of the organization.

2. The first factor of the factor analysis solution accounted for 29% of the variance in the 6 resources indicators. Only one factor was extracted because there is no theoretical reason that the concept resources should be multidimensional. Although 29% of the variance is not unusually large, the percentage is acceptable because the individual indicators were not highly correlated. In fact, the low percentage of variance suggests that each indicator has only a slight covariation with the underlying concept and a great deal of "error." This fact suggests that the validity of these measures should be examined closely, despite the logical connections between the indicators and the underlying concept.

3. The first factor accounts for 24% of the variance in the autonomy indicators. Agencies range along a dimension from legislative autonomy on one end of the scale to program autonomy on the other . See the preceding note.

4. A caveat about this measure is in order. The measure represents a relative pecking order of generalized organizational power. The resources and autonomy measure represent the degree of dependence on the political environment. Without further research we cannot be sure that this generalized measure can be translated into the distribution of societal values or the creation of dependence relationships with others.

5. For most agencies the NORC national priorities question that is part of the General Social Survey was used. For few policy areas that were not covered by this survey, data from other national surveys were used.

6. The intensity scores were based on the assumption that testimony for the bureau specifically was more of a commitment than testimony on a particular program. Testimony for a bureau was worth 3 points (or -3 points if the testimony was negative) and testimony for a program was worth 2 points (or -2). Each group testifying for a bureau was then given a score ranging from +5 to -5. The variable used here for group intensity is the mean intensity score for all groups testifying on the bureau.

7. The first factor extracted from the analysis accounts for only 14% of the variance of the indicators. The factor is readily interpretable, ranging from strong diffuse support on one end of the scale to strong clientele support on the other end of the scale. Although empirically there appear to be two dimensions here, diffuse support is a weak explanatory variable, and its inclusion as a separate factor would not affect the results of the model presented in the next section.

8. The first factor explained 18% of the variance in the 6 indicators. The factor ranges from bureaus that are large and technologically advanced on one end to highly professionalized bureaus on the other.

9. The first leadership factor explained only 14% of the variance. The low percentage of variance is a result of the three separate and distinct career patterns with little overlap and, thus, little covariation.

10. The first factor accounted for 24% of the variance in the five indicators of cohesion. The variable appears to be unidimensional.

11. The conclusions presented are also based on regressions of the four variables on both resources and autonomy. The results of these regressions are not shown here in order to conserve space. They may be obtained directly from the author.

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