DIMENSIONS OF POLITICAL SYSTEMS: FACTOR ANALYSIS OF *A CROSS-POLITY SURVEY**

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Since the publication of David Easton's *The Political System*,[1] it has become increasingly common for political scientists to speculate as to the basic factors which may be common to all political systems and which, in their varying manifestations, determine the unique styles of political behavior within each. Efforts to identify the basic political phenomena and their complex relationships have generated a variety of cross-national conceptual schemes and propositions. Some authors speak of structural and functional requisites, some refer to equilibrium conditions for system maintenance.[2] Others, employing more traditional concepts, refer to power, legitimacy, ideology, instability, consensus, influence, and bargaining. Regardless of the form these efforts assume, they all posit the existence of factors or dimensions which are common to all political systems.[3] Such attempts at cross-national theory raise two questions. If basic dimensions can be said to underlie the complex behavior within political systems, how can the dimensions be identified? And, what set of concepts have the greatest empirical relevance for describing the dimensions?

I. THE EMPIRICAL SEARCH FOR BASIC "DIMENSIONS"

This kind of theory construction and these questions are not a unique outgrowth of political science. Psychologists began grappling with similar problems sixty years ago. Anthropologists, sociologists, economists and political scientists, who are plagued by more complex units of study, have been struggling along behind.

What is unique to political science is the near absence of systematic empirical tests of the many propositions about basic dimensions. In addition to entertaining such propositions, the other social sciences have begun testing them. The psychologists, led initially by Spearman and later by Thurstone, have developed a statistical technique, factor analysis, for testing hypotheses as to the basic dimensions of intelligence and personality.[4] In discussing the particular relevance of factor analysis for identifying basic dimensions and organizing concepts in the social sciences, Thurstone says:

> A factor problem starts with the hope or conviction that a certain domain is not so chaotic as it looks. . . . If no promising hypothesis is available, one can represent the domain as adequately as possible in terms of a set of measurements of numerical indices and proceed with a factorial experiment. The analysis might reveal an underlying order which would be of great assistance in formulating the scientific concepts covering the particular domain. . . .

The exploratory nature of factor analysis is often not understood. Factor analysis has its principal usefulness at the border line of science. It is naturally superseded by rational formulations in terms of the science involved. Factor analysis is useful, especially in those domains where basic and fruitful concepts are essentially lacking and where crucial experiments have been difficult to conceive.[5]

In spite of this ground work by psychologists the broader potential of the method was largely ignored until 1949, and even then a psychologist led the way. In a seminal article, the psychologist Cattell adapted the technique to the measurement of common dimensions of

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[1] New York, 1953.

[2] For an attempt to integrate the structural and functional approaches with the systems approach, see Almond's introductory essay in Gabriel A. Almond and James S. Coleman (eds.), *The Politics of the Developing Areas* (Princeton, Princeton University Press, 1960), pp. 3–64.

[3] The terms "factor" and "dimension" are here used as equivalent, non-technical concepts. Henceforth the former will be employed in reference to the mathematical result (the columns of variables' loadings in the factor matrix) of the factor analytic calculations; the latter will refer to the phenomena of the real world which the factor delineates.

[4] For a brief history of factor analysis, see Harry H. Harman, *Modern Factor Analysis* (Chicago, University of Chicago Press, 1960), pp. 3–11.

[5] L. L. Thurstone, *Multiple Factor Analysis: A Development and Expansion of the Vectors of the Mind* (Chicago, University of Chicago Press, 1947), pp. 55–56.

cultural organization.[6] Subsequently, Berry introduced geographers and economists to factor analysis.[7]

Rummel's 1963 study, "Dimensions of Conflict Behavior Within and Between Nations," was the first cross-national application of the technique in political science.[8] A year earlier, Schubert had published a factor analysis of Supreme Court voting patterns.[9] More recently, Alker has published a similar analysis of voting in the UN General Assembly.[10] Both Rummel and Russett are currently conducting factor analyses which in part replicate Cattell's measurement of the dimensions of cultural organization within nations.[11]

Even though a growing number of political scientists are employing factor analysis, none have used the technique to address the questions: "What are the basic dimensions of political systems and what concepts best describe them?" One major obstacle has been a lack of variables with which to tap the phenomena of political institutions across all nations. Publication of A Cross-Polity Survey represented, in part, an effort to remedy this deficiency.[12]

[6] Raymond B. Cattell, "The Dimensions of Culture Patterns by Factorization of National Characters," Journal of Abnormal and Social Psychology, Vol. 44 (October, 1949), pp. 443–469.

[7] Brian J. L. Berry, "Basic Patterns of Economic Development," Atlas of Economic Development, ed. Norton Ginsburg (Chicago, University of Chicago Press, 1961), pp. 110–119 and "An Inductive Approach to the Regionalization of Economic Development," Essays on Geography and Economic Development, ed. Norton Ginsburg (Chicago, University of Chicago Press, 1960), pp. 78–107. For a collateral, but less ambitious study by a sociologist, see Leo F. Schnore, "The Statistical Measurement of Urbanization and Economic Development," Land Economics, Vol. 37 (August, 1961), pp. 229–245.

[8] Rudolph J. Rummel, in General Systems Yearbook, Vol. 8 (1963), pp. 1–50.

[9] Glendon Schubert, "The 1960 Term of the Supreme Court: A Psychological Analysis," this REVIEW, Vol. 56 (March, 1962), pp. 90–107.

[10] Hayward R. Alker, Jr., "Dimensions of Conflict in the General Assembly," this REVIEW, Vol. 58 (September, 1964), pp. 642–657.

[11] Rudolph J. Rummel, Harold Geutzkow, Jack Sawyer, and Raymond Tanter, Dimensions of Nations (forthcoming); Bruce M. Russett, "Delineating International Regions" Empirical Studies in International Relations, ed. J. David Singer (New York, the Free Press, forthcoming).

[12] Arthur S. Banks and Robert B. Textor, A

The Survey data are particularly relevant to questions about the common dimensions of political systems and their organizing concepts because the variables operationalize many of the concepts and categories used in recent attempts at cross-national theory. The authors, after canvassing the existing literature, "attempted to select and adopt—experimentally at least—every possible raw characteristic that gave promise of being workable and analytically powerful."[13]

II. THE RESEARCH PURPOSE

Given a relevant domain of data and an appropriate statistical technique, this paper seeks to answer the following questions:

(1) What factors emerge when the Survey data are factor analyzed?

(2) What dimensions can be inferred from these factors?

(3) What relevance have these dimensions for cross-national study?

(4) What specific propositions about conflict behavior are suggested by the findings?

The first question is straightforward and is answered with the factorial results. The second question is answered by inferring from the factors the existence of dimensions or "latent variables" which give rise to the intercorrelation of variables within the independent clusters.

The third question is more complex and requires elaboration. Once a dimension is identified and named, the label used becomes a concept which is operationalized by the factor. In this sense the labels are highly significant concepts, for theoretical purposes, because of their lawful (statistical) relationships with all the other variables included. Thus the interrelationships among all the variables are explained by their relationships to a limited number of concepts. In other words, the factor labels comprise a set of concepts with high generalizing power for cross-national study.

The fourth question is answered by examin-

Cross-Polity Survey (Cambridge, The M.I.T. Press, 1963). A somewhat related effort is Bruce M. Russett, et al., World Handbook of Political and Social Indicators (New Haven, Yale University Press, 1964). The compilers of the Handbook, however, set themselves the task of assembling a large number of interval-scaled data series which are ecologically relevant to political research, but which are not, in the main, substantively political in character.

[13] Banks and Textor, op. cit., p. 6.

ing the factorial results for the relationships of the conflict variables with the factors.

III. THE DATA

The present study is based on a factor analysis of the political component of *A Cross-Polity Survey*. The input data comprise 68 variables, all but five of which were derived from the 57 polychotomous characteristics of the *Survey*.[14] We omitted 16 *Survey* characteristics of an essentially ecological character, since we wished to analyze relationships *within* the political domain itself, rather than *between* the political system and its environment.[15]

In addition to the 16 non-political characteristics, three additional characteristics, 41 (Party System: Qualitative), 47 (Vertical Power Distribution), and 56 (Character of Legal System), were deleted from the factor analysis for distributional reasons.

Of the remaining 38 *Survey* characteristics, 27 were ordinal-scaled and 11 were nominal-scaled. Each nominal-scaled characteristic was "decomposed" according to its attribute components, as may be seen in Table I.[16] In order to examine the relationship of conflict to other political phenomena, we included five non-*Survey* ordinal variables: System Stability, Demonstrations, Domestic Killed, Expulsion of Ambassadors, and Foreign Killed. All but the first of these are taken directly from Rummel's work in conflict behavior.[17]

The System Stability variable is of a composite character. Standard scores were calculated for the domestic conflict factor scores

appearing in Rummel, and then weighted on the basis of his figures for percent of common variance. Standard scores were also calculated for an "Executive Stability" index derived largely from data appearing in the *World Handbook of Political and Social Indicators*.[18] The latter scores were weighted on the basis of twice the mean of the weights assigned to the Rummel-based scores. The four weighted scores were then summed into a composite stability index which, for present purposes, was dichotomized into "high" and "low" components.

The range for each of the ordinal variables is either 2 or 3. The range for each nominal variable component (as it appears in Table I) is, of course, 2.

IV. THE STATISTICAL TECHNIQUE: FACTOR ANALYSIS

Technically speaking, factor analysis is "that branch of multivariate analysis which deals with the internal structure of matrices of covariances and correlations."[19] More simply, it is a technique by means of which a large number of variables may be clustered on the basis of their intercorrelations, each set of which is presumed to reflect a single dimension which is "causing" the association within the set of variables. In the context of the *Survey* data, the factors which emerge summarize the major components of variation among the 68 variables.

Scoring and Correlation Procedure. The first step in the factor analysis was to construct a correlation matrix of the *Survey* data. The original data were in the form of polychotomous characteristics. For this study they were collapsed into two and three place variables which were then correlated using the product moment coefficient. This procedure, which, in effect, consists of assigning interval values to non-interval data for correlation purposes, is not wholly orthodox. We adopted it on the pragmatic ground that it provides a measure of the relationships among the *Survey* variables from which the major clusters can be factored out.

The suitability of various scoring and correlation techniques in factor analysis has been extensively debated by the psychologists. Thurstone advances the following argument corroborating our position:

The factorial methods are sufficiently powerful

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[14] Since each of the *Survey* variables is discussed in the *Survey* itself, it seems unnecessary to provide a set of definitions for purposes of the present article. For those unfamiliar with the *Survey*, one variable that appears in Table I may, however, require specification. "System Style" refers to the degree of "mobilization" (to attain political or social objectives) present in the system.

[15] In an earlier factor analysis involving all 57 polychotomous characteristics of the *Survey* and an eleven-factor solution, four non-political factors ("Economic Development," "Size," "Population Density," and "Religion") emerged. The remaining seven factors closely resembled those reported on below. The four nonpolitical factors correspond to factors identified by Berry, *op. cit.;* Rummel *et al., op. cit.;* and Russett, *op. cit.*

[16] The numbers in parentheses in Table I indicate the *Survey* raw characteristics from which the variables have been derived. Thus variables 22–24 are all derived from *Survey* Raw Characteristic 26 (Constitutional Status).

[17] Rummel, *op. cit.*

[18] Russett *et al., op. cit.*, pp. 101–104.

[19] D. N. Lawley and A. E. Maxwell, *Factor Analysis As a Statistical Method* (London, Butterworths and Co., 1963), p. 1.

TABLE I. ROTATED FACTOR MATRIX

	Factor							
	I	II	III	IV	V	VI	VII	h²
1. East European Areal Grouping (1)	−.58	.22	.26	−.06	.36	.00	−.24	.64
2. Advanced Western Areal Grouping (1)	.45	.25	.66	−.13	−.11	−.17	−.01	.76
3. Latin American Areal Grouping (1)	.21	.31	−.59	−.49	.17	.12	−.14	.78
4. Asian Areal Grouping (1)	−.16	.13	−.24	.55	−.06	.22	.00	.46
5. African Areal Grouping (1)	−.05	−.90	.02	−.05	−.10	.06	−.16	.86
6. North African, Middle Eastern Areal Grouping (1)	−.06	.17	−.08	.31	−.20	−.25	.50	.49
7. Freedom of the Press (13)	.80	−.22	.17	−.17	.08	.13	−.13	.79
8. Date of Independence (19)	.06	.66	.29	−.36	−.33	−.05	−.27	.83
9. Westernization (20)	.32	.60	.50	−.30	.16	−.12	−.13	.86
10. Ex-British Dependency (21)	.27	.14	.35	.69	.01	−.01	−.14	.71
11. Ex-French Dependency (21)	−.39	−.51	.10	−.13	−.15	.04	.49	.70
12. Ex-Spanish Dependency (21)	.10	.54	−.47	−.71	.09	−.01	−.24	1.08
13. Early European Political Modernization (22)	.37	.17	.45	.07	−.19	.06	−.06	.42
14. Later European Political Modernization (22)	−.04	.46	−.07	−.67	.32	−.16	−.22	.85
15. Non-European Political Modernization (22)	−.17	.21	−.02	.12	−.50	.15	−.13	.38
16. Developed Tutelary Political Modernization (22)	−.09	.14	−.26	.70	.06	.01	.39	.73
17. Undeveloped Tutelary Political Modernization (22)	−.01	−.93	.01	−.11	.03	.07	−.05	.89
18. Political Modernization—Periodization (23)	.03	.76	.30	−.10	.16	−.15	.18	.75
19. Developmental Ideological Orientation (24)	.00	−.83	−.25	−.02	.12	.07	.29	.86
20. Conventional Ideological Orientation (24)	.73	.46	.29	−.20	.02	−.01	−.10	.87
21. System Style (25)	−.74	.11	.13	.14	.37	.14	.19	.79
22. Constitutional Regime (26)	.93	.02	.11	−.08	.28	.04	.05	.96
23. Authoritarian Regime (26)	−.32	−.18	−.36	.13	−.70	−.06	.04	.77
24. Totalitarian Regime (26)	−.81	.21	.26	−.07	.39	.05	−.18	.96
25. Governmental Stability (27)	.15	.10	.89	−.01	.01	.07	−.03	.83
26. Representativeness of Regime (28)	.85	.15	.05	.02	.27	−.02	−.08	.83
27. Electoral System (29)	.94	.22	−.01	.12	.04	−.08	−.15	.98
28. Freedom of Group Opposition (30)	.92	.16	−.04	.00	−.01	−.11	−.04	.89
29. Political Enculturation (31)	.33	.21	.54	−.08	.13	.22	−.02	.52
30. Sectionalism (32)	.02	−.09	−.07	.41	−.23	−.01	−.15	.26
31. Articulation by Associational Groups (33)	.63	.54	.27	−.13	.06	−.04	.09	.79
32. Articulation by Institutional Groups (34)	−.83	.01	−.36	.21	−.03	−.10	.02	.86
33. Articulation by Non-Associational Groups (35)	−.28	−.58	−.33	.52	−.24	.05	.06	.85
34. Articulation by Anomic Groups (36)	−.43	−.17	−.51	.35	−.16	−.08	−.10	.63
35. Articulation by Political Parties (37)	.68	.20	−.16	.00	.03	−.55	−.16	.85
36. Aggregation by Political Parties (38)	.06	−.10	.34	.12	.01	.82	.20	.85
37. Aggregation by Executive (39)	.19	−.48	.15	.00	.18	.46	.61	.90
38. Aggregation by Legislature (40)	.73	.38	.28	−.07	.08	−.32	.05	.87
39. One-Party System (41)	−.77	−.23	.26	−.14	.13	.23	.24	.86
40. One Party Dominant System (41)	.14	−.24	−.24	−.02	.08	.15	−.02	.16
41. Two-Party System (41)	.43	.20	.15	.17	.00	.50	−.19	.57
42. Multi-Party System (41)	.47	.22	−.18	−.09	.08	−.69	−.06	.78
43. Stability of Party System (43)	−.12	.14	.84	−.03	.19	.28	.08	.87
44. Personalismo (44)	.00	−.08	−.66	−.22	−.34	−.12	−.09	.63
45. Elitism (45)	−.70	.41	−.18	.03	−.17	−.01	−.41	.90
46. Charisma (46)	−.33	−.37	−.04	.20	−.21	.29	.44	.60
47. Horizontal Power Distribution (48)	.86	.29	.19	.02	.20	−.07	−.08	.92
48. Presidential System (49)	.01	−.26	−.59	−.47	−.03	.21	.21	.72
49. Parliamentary-Republican System (49)	.27	.04	.20	.13	.08	−.35	.15	.28
50. Parliamentary-Royalist System (49)	.47	.01	.28	.33	.01	.02	−.35	.53
51. Status of Legislature (50)	.87	.01	.29	.02	.10	−.01	.03	.84
52. Unicameral Legislature (51)	−.49	−.51	−.03	−.11	.28	−.19	.04	.63
53. Bicameral Legislature (51)	.49	.51	.03	.11	−.28	.19	−.04	.63
54. Status of Executive (52)	−.82	−.18	−.11	−.03	−.21	.14	.13	.80
55. Modern Bureaucracy (53)	.52	.22	.65	−.01	−.10	−.25	.06	.81
56. Semi-Modern Bureaucracy (53)	−.29	.54	−.46	−.10	.47	.22	.01	.87
57. Post-Colonial Transitional Bureaucracy (53)	.00	−.92	−.05	.01	.05	.00	−.06	.85
58. Traditional Bureaucracy (53)	−.22	.11	−.10	.21	−.80	−.02	−.04	.74
59. Military Interventive (54)	−.03	.18	−.60	−.06	−.15	−.28	.04	.50
60. Military Supportive (54)	−.77	.19	.16	.12	−.12	.00	−.08	.69
61. Military Neutral (54)	.73	−.32	.34	−.07	.21	.20	.05	.84
62. Role of Police (55)	−.75	−.06	−.45	−.11	−.16	−.11	.10	.84
63. Communist System (57)	−.71	.25	.26	.06	.40	.04	−.16	.82
64. System Stability	.20	.03	.82	−.09	−.02	.05	−.09	.74
65. Demonstrations	.24	.00	−.39	−.05	−.11	−.21	.06	.27
66. Domestic Killed	.05	−.06	−.62	.21	−.06	.06	−.01	.44
67. Expulsion of Ambassadors	−.06	.09	.03	−.12	.20	.00	.51	.32
68. Foreign Killed	.00	.01	−.33	.21	−.03	.06	.49	.40
Percent of Total Variance	24.6	13.5	13.2	6.4	5.4	4.7	4.3	72.0
Percent of Common Variance	34.1	18.7	18.3	8.9	7.4	6.6	6.0	100.0

that one can take considerable liberties with the raw scores without seriously affecting the results. If we take a factor analysis in which several fundamental and meaningful factors have been clearly identified, it would be instructive to subject the factor methods to a severe test by radical changes in the original raw scores. . . . The correlation coefficients to be analyzed would then be markedly different from those used in the original analysis, but it seems quite likely that the same basic factors would be identified. This demonstration has not been made,* but it probably would be successful in showing the power of the factorial methods in isolating the underlying order among the test variables and the basic factors that determine the individual differences.[20]

In the context of the present study, this position is substantiated by correspondence between our factors and those identified by Berry, Rummel, and Russett in three independent factor analyses. (See the section below, entitled "Interpreting and Naming the Factors.")

Factorial Procedure. The next step was to factor analyze the product moment correlation matrix. Unities were inserted in the principal diagonal of the matrix. The principal-factor (or principal-component) technique was selected over competing methods on the ground that it yields a mathematically unique solution in which the first factor accounts for the maximum amount of variance within the data, while each succeeding factor extracts the maximum of the remaining unexplained variance.[21]

In order to identify the most invariant factor structure, we rotated the principal-factor solution. Using the inflection point criterion for practical significance, we selected the first seven factors for rotation. Each of these factors accounted for more than 4.0 per cent of the total variance, and the seven, when summed, accounted for 72.0 per cent of the variance. The factors were rotated to an orthogonal and to an oblique solution using Kaiser's varimax and Carroll's oblimin biquartimin criteria respectively.[22] The orthogonal solution best fulfilled

the simple structure criteria and was selected for presentation.[23]

Interpreting and Naming the Factors. The interpretation and naming of the factors involve further methodological considerations. However, by including the entire population of nations in the factor analysis, we have avoided one issue. We are not faced with the problem of estimating the significance of inferences from a sample to a larger population.

One important consideration is whether to adopt the *descriptive* or the *inferential* approach in interpreting the meaning of the factors.[24] The former considers a factor to be a set of coefficients which conveys only descriptive information about the clustering of variables on a factor. The inferential school takes one step further and assumes that the factor indicates the presence of a basic dimension or "latent variable" which "causes" the array of variables along the factor. The composition of the variables loaded by the factor and the per cent of total variance which the factor explains determine the appropriateness and strength of the inferential interpretation.

In the light of these criteria, we first employ the descriptive and then, when appropriate, the inferential approach for interpreting the *Survey* factors. Thus, in the discussion that follows, we first present the extreme clusters of each factor (all are bimodal) and interpret them descriptively as opposite types. We then consider what basic dimension might be inferred. When each variable's rank can be interpreted as representing more or less of a phenomenon common to all of the variables in the extremes, we label the factor with the appropriate ordinal concept. The inferences implied by the labels are, of course, weaker when the factors account for small portions of the total variance.

The next consideration is the *validity* of the factors. If our factors identify basic phenomena operating within political systems, they will also be delineated by other factor analyses. Even though no comparable political study has

[20] Thurstone, *op. cit.*, pp. 66–67. The asterisk refers to the following footnote in the revised edition of Thurstone's original work: "Since this chapter was written, the demonstration has been made, and is described in Chapter XV."

[21] This technique is explained by Harman, *op. cit.*, in ch. 9, "Principal-Factor Solution."

[22] Henry F. Kaiser, "The Varimax Criterion for Analytic Rotation in Factor Analysis," *Psychometrika*, Vol. 23 (September, 1958), pp. 187–200; John B. Carroll, "Biquartimin Criterion

for Rotation to Oblique Simple Structure in Factor Analysis," *Science*, Vol. 126 (29 November, 1957), pp. 1114–1115.

[23] Calculations were performed by the Indiana Research Computing Center's IBM 709. The MESA-3 program employed was developed by John B. Carroll at Harvard, coded by R. A. Sandsmark at Northwestern, and revised by Norman Swartz with the assistance of Gary Flint at Indiana.

[24] Sten Henrysson, *Applicability of Factor Analysis in the Behavioral Sciences* (Stockholm, Almquist and Wiksell, 1960), pp. 86–88.

been completed, we found partial correspondence between our factors and those of independent studies by Rummel, Russett, and Berry. Rummel's and Russett's factor analyses of social, economic, and political variables yielded the following five factors: "Economic Development," "Communism," "Intensive Agriculture" or "Density," "Size," and "Catholic Culture" or "Religion." [25] These factors correspond to five of eleven which we calculated in an earlier factor analysis of the social and economic in addition to the political variables of the *Survey*. The remaining six factors closely resemble the political factors reported on below. Berry's study of economic data identified three factors ("Technology, Demography," and "Size"), which also correspond to factors calculated from the *Survey* data.[26]

From this convergence, we conclude that the earlier *Survey* factors are valid measures of the dimensions suggested, including one that is political in character. More importantly, the earlier results encourage the expectation that future factorial studies will add to the validity of the political factors yielded by the present study.

A further consideration is raised by the communality value 1.08 for the variable "Ex-Spanish Dependency" in Table I. This high communality (the normal range is zero to one) was caused by missing data.[27] We did not estimate values for missing data, therefore the number of cases entering into each correlation is not the same. As a consequence, the correlation matrix does not exhibit Gramian properties, and the variances and communalities in the factor matrix are slightly inflated. With this consideration in mind, we rely on the relative, rather than absolute, values of the factor loadings and communalities in interpreting the factors. Also, we adopt a high value, $\pm.50$, for identifying the significant variable loadings. This value is safely above the $\pm.30$ generally suggested by factor analysts.

V. THE RESEARCH FINDINGS

Before examining Table I in detail, the single most important implication of the factor matrix should be noted, *viz.*, that the *Survey*

[25] Rummel *et al.*, *op. cit.* and Russett, *op. cit.*

[26] Berry, *op. cit.*

[27] Due to an artifact of coding procedure taken over directly from the *Survey*, the variable "Ex-Spanish Dependency" exhibits an unusually high missing data component. For this variable, in addition to normal missing data attrition, only ex-colonial dependencies were assigned substantive codings, some 40 countries being regarded as "irrelevant" to the coding category.

data are highly structured along factors largely independent of each other.

The seven factors account for 72 per cent of the total variance among the 68 variables, *i.e.*, an average of 72 per cent of the variance of each variable. Of the 68 variables, only seven failed to be loaded higher than $\pm.50$ by at least one factor, while only three were loaded higher than $\pm.50$ by more than one factor. Hence, except for three overlapping variables, the solution employed yields mutually independent factors.

These findings indicate that the political phenomena measured by the data do not occur randomly from one polity to the next; they occur in highly associated patterns or dimensions. In other words, basic dimensions do underlie the complex behavior within political systems.

In the following sections these factors are interpreted and the dimensions are inferred. It must be remembered, when hypothesizing with regard to dimensions, that the inferences are made with varying degrees of confidence. The large proportions of total variance accounted for by each of the first three factors (24.6%, 13.5%, and 13.2%) support strong inferences. The smaller amount of variance explained by the last four factors (6.4%, 5.4%, 4.7%, 4.3%) sustain successively weaker inferences.

Factor I: Access. Table II displays the highly loaded variables comprising the extreme portions of Factor I, which accounts for a large portion, 24.6 per cent, of the total variance. In examining these variables, the following dichotomies emerge: hierarchical as opposed to competitive bargaining processes; consolidated as opposed to distributed authority and force; executive and single-party politics as opposed to legislative and group politics; totalitarian restrictions as opposed to institutionalized openness of political channels. The dichotomies refer generally to restrictive as opposed to permissive institutions and interaction. Or, to use Truman's concept, Factor I reflects *the degree of access to political channels*.[28]

This conclusion is further substantiated when we examine the rank order of the areal groups on the factor (Table III). The high loadings of the Western, Latin American, and East European groups correspond to documented fact. The low loading of the African group reflects political channels which, due to their variety, absence, lack of differentiation, and newness are randomly rather than systematically distributed in terms of access. For

[28] David B. Truman, *The Governmental Process* (New York, 1955), p. 264 ff.

TABLE II. FACTOR I: ACCESS

Factor Loading	Variable
.94	Electoral System
.93	Constitutional Regime
.92	Group Opposition
.87	Status of Legislature
.86	Horizontal Power Distribution
.85	Representativeness of Regime
.80	Press Freedom
.73	Aggregation by Legislature
.73	Military Neutral
.73	Conventional Ideological Orientation
.68	Articulation by Parties
.63	Articulation by Associational Groups
.52	Modern Bureaucracy
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−.58	East European Areal Grouping
−.70	Elitism
−.71	Communist System
−.74	System Style
−.75	Role of Police
−.77	One-Party System
−.77	Military Supportive
−.81	Totalitarian Regime
−.82	Status of Executive
−.83	Articulation by Institutional Groups

TABLE IV. FACTOR II: DIFFERENTIATION

Factor Loading	Variable
.76	Political Modernization—Periodization
.66	Date of Independence
.60	Westernization
.54	Articulation by Associational Groups
.54	Semi-Modern Bureaucracy
.54	Ex-Spanish Dependency
.51	Bicameral Legislature
.46	Later European Political Modernization
.46	Conventional Ideological Orientation
.41	Elitism
.38	Aggregation by Legislature
.	
.	
.	
−.37	Charisma
−.48	Aggregation by Executive
−.51	Ex-French Dependency
−.51	Unicameral Legislature
−.58	Articulation by Non-Associational Groups
−.83	Developmental Ideological Orientation
−.90	African Areal Grouping
−.92	Post-Colonial Bureaucracy
−.93	Undeveloped Tutelary Political Modernization

similar reasons, the random distribution of North African and Middle Eastern nations is not surprising.

Specialists in political development, consensus, and conflict will note that these phenomena are not highly associated with degree of political access.

Factor I yields empirical evidence supporting the widespread use of measures of constitutionalism, authoritarianism, totalitarianism, and representation in comparative and theo-

TABLE III. DISTRIBUTION OF AREAL GROUPING VARIABLES ALONG THE ACCESS FACTOR

Factor Loading	Variable
.45	Advanced Western Areal Group
.21	Latin American Areal Group
−.05	African Areal Group
−.06	North African, Middle Eastern Areal Group
−.16	Asian Areal Group
−.58	East European Areal Group

retical work. In addition, the factor suggests a need for more precise measurement of the quantity and quality of restrictions imposed on competition for control of political channels.

Factor II: Differentiation. Table IV rank orders the variables loaded heavily by Factor II, which accounts for 13.5 per cent of the total variance. The extremes of the factor contrast late stages of modernization against undeveloped tutelary modernization, conventional against developmental ideology, semi-modern against post-colonial bureaucracy, and aggregation by legislature against aggregation by executive. Note that the extremes do not contrast the westernized democracies with traditional monarchies. The factor does not, therefore, measure the full range of phenomena which could properly be interpreted as "political development." In the light of these findings, we interpret the factor to reflect a dimension of *differentiation of political institutions within former colonial dependencies.*

Factor II lends empirical support to the com-

parative and theoretical focus on measures of institutional differentiation and specialization within the ex-colonial nations. It also indicates the need to develop more sophisticated typologies than presently exist for the classification of transitional political systems. For example, the two polity groups most directly involved in the variable extremities of this factor (the Latin American and the African) are classified according to quite different sets of typological criteria in Almond and Coleman.[29] Thus, while the negative loadings might be regarded as according with one or more components of the "Almond-Shils" schema (e.g., "Tutelary Democracy" or "Terminal Colonial Dependency"), it is evident that no element of the same typology applies to the set of high positive loadings for Factor II.

The latter extreme loads characteristics of older ex-colonies whose political institutions have at least in a structural sense been substantially westernized. The other extreme loads characteristics of recently dependent territories which have yet to become accommodated to other than rudimentary institutions of self-government. While one might expect polities exhibiting high positive scores for this factor to be more democratic, more stable, and more consensual than those exhibiting high negative scores, variables indexing these phenomena are, by and large, conspicuous by their absence.

We hypothesize, therefore, that this factor measures what may be termed the political counterpart to social differentiation. This is to suggest that if a large number of variables indexing social structure had been included in the present study, a "social differentiation" factor would undoubtedly emerge and many of the high loading Factor II variables might also be expected to load heavily on such a factor.

Certain of the positive loading Factor II variables may also represent, or suggest, necessary (but not sufficient) conditions for a stable democratic political system in a highly differentiated social and economic milieu. Indeed, the presence of a moderate degree of elitism, when coupled with articulation by associational groups and legislative aggregation does not appear to be inconsistent with this hypothesis when viewed in the context of Kornhauser's theses as to the preconditions of democracy and totalitarianism, respectively.[30]

Factor III: Consensus. The extreme loading variables of Factor III, which accounts for

[29] Almond and Coleman, op. cit., pp. 522–567.
[30] William Kornhauser, The Politics of Mass Society (Chicago, 1959).

TABLE V. FACTOR III: CONSENSUS

Factor Loading	Variable
.89	Governmental Stability
.84	Stability of Party System
.66	Advanced Western Regional Grouping
.65	Modern Bureaucracy
.54	Political Enculturation
.50	Westernization
.	
.	
.	
−.51	Articulation by Anomic Groups
−.59	Latin American Areal Grouping
−.59	Presidential Legislative-Executive Structure
−.60	Military Interventive
−.66	Domestic Killed
−.66	Personalismo

13.2 per cent of the total variance, are presented in Table V. Examination of the variables reveals the following dichotomies: personalistic party politics as opposed to party system stability; governmental stability as opposed to military intervention; overall system stability as opposed to domestic killed; political enculturation as opposed to articulation by anomic groups. These dichotomies reflect agreement as opposed to dissent with regard to the basic channels and institutions of political participation. Factor III seems to tap the degree of consensus and cooperation among participants as to the rules governing political activity. Note that the negative pole of the factor reflects not only dissent and opposition, but direct, physical conflict.

The rank order of the areal groups on the factor (Table VI) adds further substance to this interpretation. The positive loadings of the Western and East European nations are as

TABLE VI. DISTRIBUTION OF AREAL GROUPING VARIABLES ALONG THE CONSENSUS FACTOR

Factor Loading	Variable
.66	Advanced Western Areal Grouping
.26	East European Areal Grouping
.02	African Areal Grouping
−.08	North African, Middle Eastern Areal Grouping
−.24	Asian Areal Grouping
−.59	Latin American Areal Grouping

expected. The low correlation of the African nations reflects a widespread lack of consensus as to the structure of political institutions in the area. However, this lack of consensus is not typically accompanied by a high incidence of open conflict (domestic killed and military intervention) between opposing groups. Lack of consensus in Latin American and Asian countries, on the other hand, gives rise to open dissent, coups, and conflict. This contrast raises the question, "What are the forms and causes of open opposition when political consensus is absent within a nation?"

The emergence of this dimension supports the comparative and theoretical use of concepts bearing on agreement, consensus, cooperation, dissent, opposition, and conflict. Most of these phenomena fall within that area of the discipline now focusing on political culture and attitudes. The findings suggest that in addition to measuring attitudes of consensus and dissent researchers should more systematically explore the overt behavior resulting from these attitudes.[31]

TABLE VII. FACTOR IV: SECTIONALISM

Factor Loading	Variable
.70	Developed Tutelary Political Modernization
.69	Ex-British Dependency
.55	Asian Areal Grouping
.52	Articulation by Non-Associational Groups
.41	Sectionalism
.35	Articulation by Anomic Groups
	.
	.
	.
− .36	Date of Independence
− .47	Presidential Legislative-Executive Structure
− .49	Latin American Areal Grouping
− .67	Later European Political Modernization

[31] Rummel has initiated an examination of "causes" of domestic conflict but has encountered a lack of relevant survey data. See Rudolph J. Rummel, "Testing Some Possible Predictors of Conflict Behavior Within and Between Nations," *Proceedings of the Peace Research Society*, Vol. 1 (1963). A useful pilot study in this regard is Gabriel A. Almond and Sidney Verba, *The Civic Culture: Political Attitudes and Democracy in Five Nations* (Princeton, Princeton University Press, 1963).

TABLE VIII. FACTOR V. LEGITIMATION

Factor Loading	Variable
.47	Semi-Modern Bureaucracy
.40	Communist System
.39	Totalitarian Regime
.37	System Style
.36	East European Areal Grouping
.32	Later European Political Modernization
	.
	.
	.
− .50	Non-European Political Modernization
− .70	Authoritarian Regime
− .80	Traditional Bureaucracy

Factor III also serves to substantiate the usefulness of typologies delineating clusters of characteristics that contrast "stable" with "unstable" political systems.

Factor IV: Sectionalism. The fourth factor, accounting for 6.4 per centof the total variance, is only one-fourth as strong as the first and one-half as strong as the second and third, and therefore provides a weaker basis for inference. For this same reason, inferences based on factors five, six, and seven cannot be made with the high degree of confidence earlier expressed.

The extremes of the factor (see Table VII) contrast colonial developmental characteristics in much the same manner as does Factor II. An important difference is that the earlier set of ex-French, African characteristics is here replaced by an ex-British, Asian configuration. The extreme loading variables are, however, less amenable to interpretation than in the case of Factor II. The ex-British dependencies are, in certain respects, more "developed" than their ex-French counterparts, yet the internal developmental cleavages between social sectors are obviously more pronounced. This is reflected in the loadings of sectionalism and anomic group activity. For want of a better term, we therefore interpret this factor as tapping a specific *pattern of institutional differentiation occurring in a political system exhibiting high sectionalism.*

Factor V: Legitimation. The extremes of Factor V, as exhibited in Table VIII, contrast totalitarian regimes against authoritarian regimes, semi-modern bureaucracies against traditional bureaucracies, and later European political

TABLE IX. DISTRIBUTION OF VARIABLES REFLECT-
ING PHENOMENA OF LEGITIMATION AND AUTHORITY
ON THE LEGITIMATION FACTOR

Factor Loading	Variable
.47	Semi-Modern Bureaucracy
.40	Communist Regime
.39	Totalitarian Regime
.37	System Style
.28	Constitutional System
.27	Representativeness of Regime
.21	Military Neutral
.20	Horizontal Power Distribution
.12	Developmental Ideological Orientation
− .02	Conventional Ideological Orientation
− .12	Military Supportive
− .15	Military Interventive
− .16	Role of Police
− .17	Elitism
− .21	Charisma
− .24	Articulation by Non-Associational Groups
− .34	Personalismo
− .70	Authoritarian Regime
− .80	Traditional Bureaucracy

modernization against non-European political modernization.

Most of these variables reflect the source and distribution of authority within political systems. More specifically, they refer to *the means by which political authority is legitimized.* As demonstrated by the rank order of variables in Table IX, they can be construed as falling along a continuum between the classical Weberian ideal types of rational-legalistic legitimation and traditional legitimation. In examining the variable positions, the characteristics of rational and legalistic authority fall at one extreme, while the characteristics of traditional and charismatic authority occupy the other.[32]

Factor VI: Interest. The extreme loading variables of Factor VI are exhibited in Table X. In addition to contrasting two-party and multi-party systems, this factor identifies the role which political institutions assume in *patterns of interest circulation.* It should be stressed that this factor is typological in that it contrasts patterning rather than the amount of

[32] *Cf.* Leonard Binder's neo-Weberian typology in *Iran: Political Development in a Changing Society* (Berkeley and Los Angeles, University of California Press, 1962), pp. 44–45.

TABLE X. FACTOR VI: INTEREST

Factor Loading	Variable
.82	Aggregation by Political Parties
.50	Two-Party System
.46	Aggregation by Executive
.	
.	
.	
− .32	Aggregation by Legislature
− .35	Parliamentary-Republican
− .55	Articulation by Political Parties
− .69	Multi-Party System

interest circulation. The Access factor, which contrasts systems with large numbers of interest articulation points against systems with few access institutions, measures the volume of interests processed by the system.

Also, it is significant that this factor does not measure all components of the Almond-Coleman articulation-aggregation schema.[33] It identifies only the distinctly political institutions for handling interests injected into the system, rather than the full range of interest-bearing groups.

This factor highlights the importance of the channels of interest circulation in the political process. It also provides support for the generalizing power of typologies of party systems.

Factor VII: Leadership. Factor VII loads only 4.3 per cent of the total variance and does not exhibit the pronounced bimodal configuration of the others. The positive extreme of the factor loads variables which reflect *strong executive leadership in both domestic and foreign affairs.*

TABLE XI. FACTOR VII: LEADERSHIP

Factor Loading	Variable
.61	Aggregation by Executive
.51	Expulsion of Ambassadors
.50	North African, Middle Eastern Areal Grouping
.49	Foreign Killed
.49	Ex-French Dependency
.44	Charisma
.	
.	
.	
− .41	Elitism

[33] Almond and Coleman, *op. cit.*, p. 33 ff.

This dimension calls attention to the need for systematic studies of executive roles and leadership style in both comparison and theory. The random distribution of other leadership variables along this factor indicates the complexity of the phenomena in question. The relatively low strength of the factor indicates that its typological value is limited.

Unexplained Variables. The factor structure accounts for less than 50 per cent of the communalities (h^2) of the variables exhibited in Table XII. However, as indicated by the factor loadings in parentheses, six of these variables correlate above .50 with one of the factors. In other words, at least one major source of variation for each of these six variables is identified by the factor matrix. We conclude, therefore, that only five exhibit variation substantially independent of the factors identified.

Of the regional groupings, the North African, Middle Eastern and the Asian display considerably less explained total variance than do the others. In short, political phenomena in these countries are not highly structured along the dimensions discovered. These areas may, of course, exhibit characteristics that structure themselves along other dimensions, possibly religious or cultural, that the present study is not designed to tap.

VI. CONCLUSIONS: RELEVANCE OF THE FINDINGS FOR CROSS-NATIONAL STUDY

In the preceding sections, we have proposed the following answers for the first two research questions: the *Survey* data are highly correlated along a relatively limited number of factors; these factors provide evidence for inferring seven basic political dimensions— Access, Differentiation, Consensus, Sectionalism, Legitimation, Interest, and Leadership.

Theory and Research. The third question asks, "What is the relevance of these dimensions for cross-national study?" The dimensions have impact in the following areas: theory and research, comparison, and typology construction. First, they suggest a basic set of concepts around which *theory construction and research* should proceed. According to our findings the seven underlying dimensions are systematically related to ("cause") a wide variety of manifest political behavior. In this sense, the concepts naming the dimensions are theoretically significant; they are lawfully related to much political behavior and therefore can be used as basic concepts within a large body of interrelated generalizations. And this is the first step toward empirical theory. However, to facilitate their use in theory and research, the concepts need to be operationalized by simple definitions rather than by elusive factors. This is done by devising variables which correlate highly with each of the factors. If future factor analyses yield similar factors and a set of corresponding variables is devised, theoreticians and researchers will have advanced an enormous step toward an important goal—empirical theory.

Comparative Study. Second, the seven factors can be used as composite scales for *comparing political systems.*[34] For example, the political system of Great Britain has a higher score on Factor I (which measures the degree of political access) than does that of Poland.[35] By

[34] Russett, *op. cit.*, develops a very useful method for applying the factors as comparative scales.

[35] We have not actually calculated factor scores in order to compare nations on the factors. The loadings of the areal grouping variables do, of course, provide insight as to what nations might

TABLE XII. VARIABLES LEAST EXPLAINED BY THE SEVEN FACTORS

Highest F. L.	Variable	Communality
− .24	One Party Dominant System	.16
.41	Sectionalism	.26
− .39	Demonstrations	.27
− .35	Parliamentary-Republican System	.28
(.51)	Expulsion of Ambassadors	.32
(.55)	Non-European Political Modernization	.38
(.51)	Foreign Killed	.40
.45	Early European Political Modernization	.42
(− .62)	Domestic Killed	.44
(.55)	Asian Areal Grouping	.46
(.50)	North African, Middle Eastern Areal Grouping	.49

knowing the scores of a nation on all seven factors, we are in a position to make statistical predictions as to the probabilities with which phenomena measured by the 68 variables of Table I will occur within the political system in question. This capability seems especially useful with regard to phenomena indexed by variables such as government stability, articulation by anomic groups, stability of party system, military intervention, demonstrations, and the like.

Typology Construction. The findings have import in a third area of cross-national study—*typology construction.*[36] The latter approach seeks a middle ground between the powerful but scarce results of theory and the multitudinous but mundane yields of comparison. Instead of focusing on the dimensions common to all systems, it involves the construction of a small set of categories which will adequately describe the *range* of relationships across a variety of systems. Generally, the elements of a typology are a set of definitions mixed with propositions, each of which is assumed to describe a cluster of phenomena that is highly recurrent (predictable) in each of the system types specified.

The usefulness (generalizing power) of a

typology depends on the number of characteristics and political systems which it can explain. For example, Aristotle's three-type classificatory scheme (monarchy, aristocracy, democracy) seems to have described adequately all political systems of the classical Greek period with reference to a single set of characteristics having to do with authority structure. In a somewhat similar manner, Almond and Coleman's basic typology (traditional, transitional, modern) is useful as a means of categorizing contemporary political systems with reference to a set of characteristics centering on specialization of political structure.[37]

The objective of the approach is to develop the most parsimonious set of categories that will serve as the basis of generalization about the greatest number of political systems. Success depends on delineating the most frequently recurring types which are mutually independent and not simply disguised mutations. In this sense, the underlying assumptions and criteria of typology construction and factor analysis correspond. Both endeavor to delineate sets of variables which are highly associated across many cases. When only the highest loading variables on each factor are considered, they reflect a small cluster of phenomena occurring simultaneously in a specific set of nations. The simple structure criterion guarantees that the cluster and the set are mutually exclusive of all others along their respective factors. In this way, factor analysis utilizes systematic methods for identifying sets of variables that are analogous to typological constructs.

Therefore, the results of this factorial study provide information as to what clusters of characteristics will yield types of greatest inclusiveness and generalizing power. Table

be expected to correlate most strongly with the various factors. However, the loadings of the areal grouping variables lose their meaning when the nations are quite heterogeneous with respect to the dimension that the factor taps. On this point, see Lawley and Maxwell, *op. cit.,* pp. 88–92.

[36] For an excellent discussion of the methodological status of typologies in the social sciences, see the remarks of Carl G. Hemple in "Symposium: Problems of Concept and Theory Formation in the Social Sciences," *Science, Language, and Human Rights* (Philadelphia, University of Pennsylvania Press, 1952), I, 65 ff.

[37] Almond and Coleman, *op. cit.,* p. 33 ff.

TABLE XIII. MAJOR CLUSTER TYPES OF *SURVEY* VARIABLES

Survey Factor	Loading	Cluster Type
I	Positive	Polyarchic System
I	Negative	One-Party Totalitarian System
II	Positive	Westernized Democratic System
II	Negative	Undeveloped Democratic System
III	Positive	Stable System
III	Negative	Unstable System
V	Negative	Traditional Authoritarian System
VI	Positive	Two-Party System
VI	Negative	Multi-Party System
VII	Positive	Modernizing Authoritarian System

XIII displays the cluster types suggested by the *Survey* factors.[38]

These categories, inductively derived from the *Survey* data, provide confirmation for many types which political scientists currently employ. For example, the *Survey*-derived type, "One-Party Totalitarian System," exhibits the same characteristics that Friedrich and Brzezinski label "Totalitarian Dictatorship."[39] The types "Two-Party System" and "Multi-Party System" substantiate many of the propositions that Duverger sets forth in his party system typology.[40] The *Survey* types "Westernized Democratic System," "Undeveloped Democratic System," "Traditional Authoritarian System," and "Modernizing Authoritarian System" add support to Shils' and Almond's types, "Political Democracy," "Tutelary Democracy," "Traditional Oligarchy," and "Modernizing Oligarchy."[41] "Polyarchic System" encompasses most of the characteristics which Dahl subsumes under the label "Polyarcal."[42]

Conflict Propositions. The final research question posed asks, "What specific propositions about conflict in political systems are suggested by the findings?" Examination of the conflict variables (Demonstrations, Domestic Killed, Expulsion of Ambassadors, and Foreign Killed) leads to the following propositions:

(1) The political dimension, *leadership*, which accounts for foreign conflict does not account for domestic conflict.

(2) The presence of strong executive *leadership* is frequently accompanied by both diplomatic and violent foreign conflict.

(3) *Access* to political channels, *differentiation* of political institutions, *sectionalism* within developing systems, kind of *legitimation*, and type of *interest* circulation tend to be unassociated with violent and diplomatic foreign conflict.

(4) The political 'dimension, *consensus*, which accounts for most of the domestic conflict does not account for diplomatic conflict, but is moderately associated with violent foreign conflict.

(5) An absence of political *consensus* is associated with violent domestic conflict.

(6) An absence of political *consensus* is moderately associated with non-violent domestic conflict.

(7) The degree of *differentiation* of political institutions, kind of *legitimation*, and type of *leadership* tend to be unassociated with violent and non-violent domestic conflict.

These propositions, in large measure, substantiate those advanced by Rummel and Tanter in their conflict research.[43] In addition, they identify the two political phenomena (lack of consensus, strong executive leadership) which are most frequently associated with domestic and foreign conflict, respectively.

[38] We have not named those factor clusters which are not readily interpreted or which duplicate other clusters.

[39] Carl J. Friedrich and Zbigniew K. Brzezinski, *Totalitarian Dictatorship and Autocracy* (Cambridge, Harvard University Press, 1956), pp. 9–10.

[40] Maurice Duverger, *Political Parties: Their Organization and Activity in the Modern State* (New York, 1963), p. 203 ff.

[41] Almond and Coleman, *op. cit.*, pp. 53–55.

[42] Robert A. Dahl, *A Preface to Democratic Theory* (Chicago: University of Chicago Press, 1956), p. 63 ff.

[43] Rummel, "The Dimensions of Conflict Behavior Within and Between Nations," p. 24; Raymond Tanter, "Dimensions of Conflict Behavior Within Nations, 1955–60: Turmoil and Internal War," *Proceedings of the Peace Research Society*, Vol. 3 (1964).