

FACTOR 3

THE DIMENSIONALITY OF NATIONS PROJECT

RESEARCH REPORT

RESEARCH REPORT NO. 41

"U.S. FOREIGN RELATIONS: CONFLICT, COOPERATION, AND ATTRIBUTE DISTANCES"

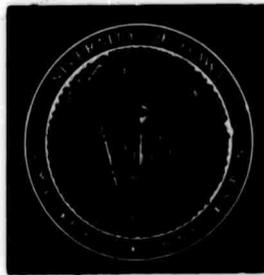
R. J. Rummel

FACTOR 1

DEPARTMENT OF POLITICAL SCIENCE

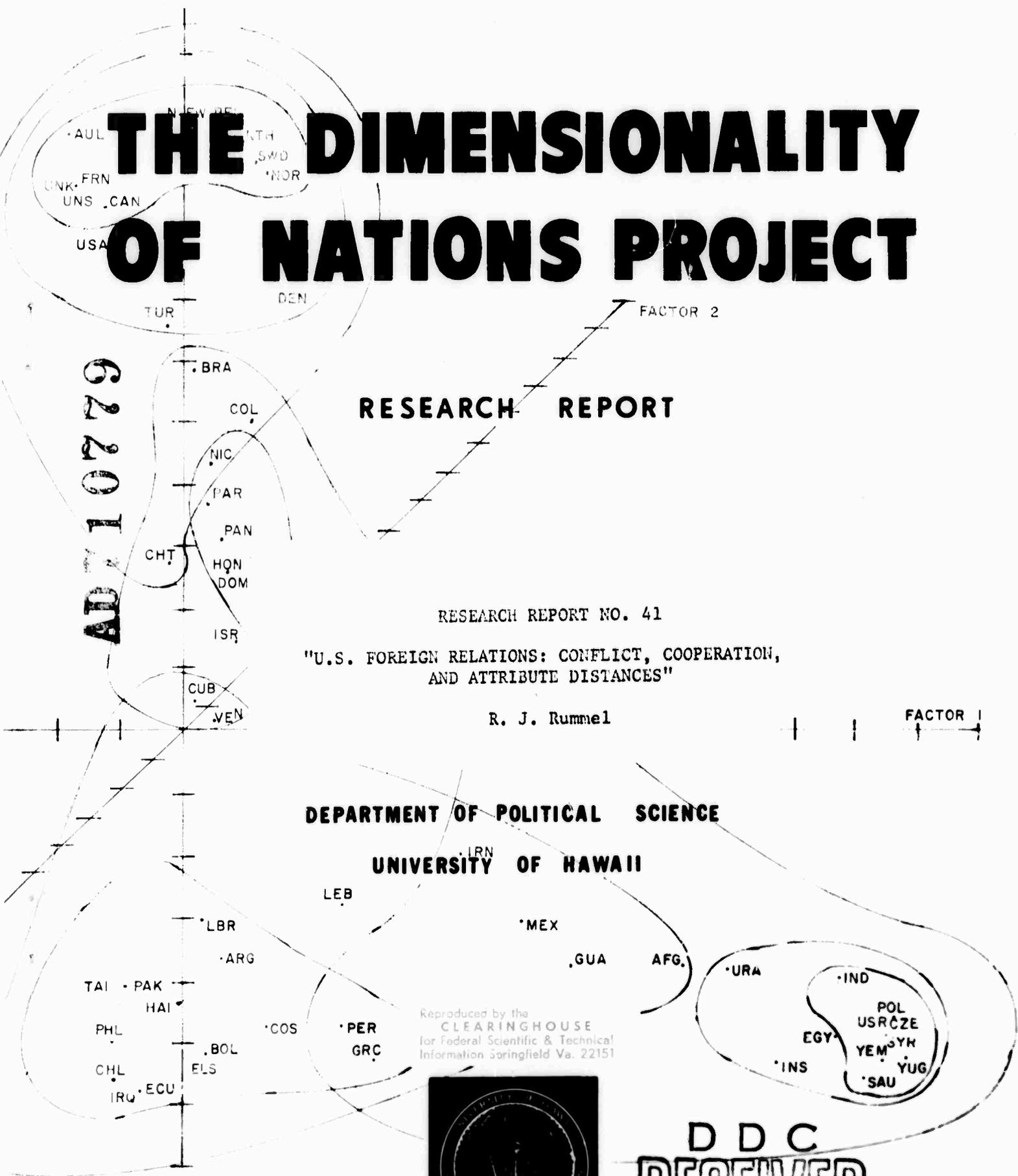
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The Dimensionality of Nations Project
Department of Political Science
University of Hawaii

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"U.S. FOREIGN RELATIONS: CONFLICT, COOPERATION,
AND ATTRIBUTE DISTANCES"

R. J. Rummel

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U.S. FOREIGN RELATIONS:
CONFLICT, COOPERATION, AND ATTRIBUTE DISTANCES*

ABSTRACT

The foreign relations of the United States is considered in terms of six hypotheses based on (1) the linkage "pre-theory" of James Rosenau, (2) the social status theory of Johan Galtung, (3) the distance theory of Quincy Wright, (4) the power transition theory of A. F. K. Organski, (5) the integration-regional findings of Bruce Russett, and (6) propositions about geographic distance.

These hypotheses are linked together by the notion of a distance vector, interpreted in terms of the constructs of "attribute space," "behavior space," and "dyads," and developed within a geometric framework called field theory.

To test this field theory and hypotheses subsumed by it, data on nineteen foreign relations and actions of the U.S., ranging from tourists and treaties to negative communications and sanctions, toward 81 object nations were correlated (using canonical analysis) with the distances between the U.S. and other nations on economic development, size or power bases, political orientation, socio-cultural dimensions, and geographic distance.

The general results support the "pre-theory" of Rosenau, the status theory of Galtung, and an emphasis on homogeneity in integration theory. This suggests that these theories can be synthesized in a larger framework such as field theory.

The specific results are:

(1) U.S. behavior toward other nations consist of six independent patterns: Western-European Cooperation, Anglo-American Cooperation, Aid, Cold War behavior, Deterrence, and Negative Sanctions;

(2) joint Western-European Cooperation (such as treaties, military aid, students, and conferences) and Deterrent action of the U.S. toward another nation are a function of the power parity of the object nation (with a multiple correlation of .94);

(3) the Western-European Cooperative behavior relative to deterrent behavior of the U.S. toward another nation is dependent on the similarity in political orientation of the two and the degree to which the other nation has a Catholic culture (with a multiple correlation of .78);

(4) differences in economic development, size (or power bases), and political orientation from the object nation jointly explain about twenty-seven percent of the variation in U.S. dyadic behavior;

(5) overall U.S. differences on attributes from the object nation explain about forty-seven percent of the variation in U.S. behavior.

*My thanks to Warren Phillips for carefully reading and commenting on a previous draft of this paper.

U.S. FOREIGN RELATIONS:
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In any one day, the foreign relations of the United States consist of a multitude of distinct actions. Some of them are consciously a part of the government's foreign policy, such as warning the Soviet Union on her overt military involvement in the Middle East prior to publicly announced discussions with Israel's foreign minister on the Israeli request for U.S. jet fighters. Other actions are separate from immediate foreign policy considerations and distinct from each other, such as a shipment of American automobiles to Denmark and twenty-five American students entering India for a year of foreign study. And still other actions are of such importance and consequence as to immediately affect most U.S. international relations, such as the sudden American attack on Viet Cong and North Vietnamese sanctuaries in Cambodia.

Obviously, the international relations of any one country, especially one as economically developed and powerful as the U.S.,¹ will be diverse and multidimensional. How are we to make sense out of all these actions, for both the scholar and practitioner of international relations?

Traditionally, the scholar refines a conceptual framework of international relations which places these actions in relation to each other, orders them in a cause-effect hierarchy, and weights them in their prominence for practicing and understanding international politics.

¹In a factor analysis of ninety-four actions of eighty-two nations (Rummel, 1966), the volume of participation in the international system was the largest dimension found; in a separate analysis (Rummel, forthcoming), it was shown that this volume could be accounted for by the level of economic development and power bases (defense budget, size of the military, population, national income, energy production, etc.) of a nation.

He divides a nation's actions into public and private actions, relates them to immediate, short and long run foreign policy goals, imbues those actions with consequences for the power and national interest of a nation, and categorizes them into causes, effects, conditions, or processes.² The practitioner, less self-consciously theoretical and abstract, generally deals with international relations on a day by day basis, responding to actions of other nations when necessary to satisfy bureaucratic and political demands, innovating and initiating actions to meet contingencies, and restraining or channeling other actions as events require.

The conceptual world of the practitioner consists of individuals-- decision makers, elites, and influentials. The structure of a nation, in its economic development, political system, culture, and history are givens. International law and organizations, the number and variety of nations and their geographic separation, and the configuration of power and alliances, are the context within which human beings barter, exchange, fight, negotiate, and cooperate. If the practitioner, as he does often, says that the U.S. has done such, or that the U.S. desires ... , he knows this is a semantic convenience--an accepted and understood reification--and in effect he means that Dr. Henry Kissinger has influenced President Nixon to say ... , or that Secretary Rogers initiated those diplomatic moves to placate Senator Fulbright. The practitioner's questions are generally not those of the

²This is not meant to imply that the variety of frameworks within which scholars try to give meaning and understanding to international relations are generally clear, comprehensive, or explicit in all their interrelationships. Most scholarly literature in this field, especially those texts concerned with establishing such general frameworks, are concerned more with definitions than relationships, more with listing and describing "elements" than linking them together, more with description than explanation, more with focusing on power and conflict than interrelating the myriad activities of nations, more on nation qua nation than inter nation, and in short, more with taxonomy, philosophy, and contemporary history than scientific theory, explanation, and empirical findings.

scholar's. He is not, except in perhaps an intellectual sense, concerned with how the size of nations affects their trade, or even the relationship between economic development and foreign conflict behavior. He would prefer to know such things as the likely successor to Mao and his past relationships and attitudes toward the U.S. and the Soviet Union, and the changes he is likely to make in China's foreign behavior.

In short, the practitioner conceptualizes and understands the diverse international relations at the individual level--as the daily interaction of human beings. Scholars, on the other hand, often are interested in the theoretical understanding of such actions at the aggregate level. They wish to theorize about these actions in the aggregate and relate them to the practitioners' givens. They wish to isolate the forces and indicators, to delineate the patterns and trends in aggregate actions, and to stipulate or discover the social and political laws of international relations.³

³ Galtung and Ruge (1965) present a relevant discussion of diplomatic styles. They consider the traditional diplomatic style to be individually oriented, with a recent and growing structurally-oriented attitude contending for prominence. Galtung and Ruge liken the structural orientation to the perspective of social scientists and see the growth of this attitude in the diplomatic corps as partially a result of greater training in social science areas and a shift in the background of the diplomat. Their individual-structural dichotomy is close to the individual-aggregate levels I am establishing here. When one is at the aggregate level, he is structural. But being structurally-oriented does not necessarily mean working at the aggregate level, for the structures of concern may still be uniquely considered. For example, Huntington's (1961) study of U.S. defense policy making is quite structurally-oriented in discussing political patterns and the relevant forces, but is not a study at the aggregate level. Policy and political data are not aggregated and compared and the analysis is not presented in an explicit comparative framework. For a definition of aggregate level, see footnote 4.

" ... of all forms of mental activity, the most difficult to induce even in the minds of the young, who may be presumed not to have lost their flexibility, is the art of handling the same bundle of data as before, but placing them in a new system of relations with one another by giving them a different framework, all of which virtually means putting on a different kind of thinking-cap for the moment." (Butterfield, The Origins of Modern Science, p. 1)

At the aggregate level, however, many actions are structured; they are highly correlated, ordered, and patterned.⁶ They seem to be lawful and subject to scientific study and prediction. On the whole, aggregate international relations appear more regular than random, more to be explained by deterministic equations than probabilistic statistics.

This transformation in perspective which takes place as one shifts his vision from an individual to an aggregate level might be best illustrated by an example from physics. Gas molecules seem to move in an unordered, random fashion, as capricious as human behavior in international relations. At an aggregate level, however, the random molecular motions are patterned, ordered in their totality, enabling us to assert Boyles law that gas pressure on a container times the volume equals a constant (at constant temperature).

The shift in appearance of international relations between the individual and aggregate perspectives causes difficulty in communication. A practitioner or scholar whose paradigm is individual centered does not appreciate nor understand the scholar's emphasis on scientific theory and

⁶What is structure depends on our methods, our units of analysis, and the actions which are aggregated. For example, the number of wars of nations at one time period may have a high correlation with the number they are involved in during a previous time period, as found in Rummel (1963, Table 2) for wars 1955-57 and wars 1825-1945. However, if one looks at the number of wars of varying intensity in the international system at different time points, then war may be considered to be a random phenomena described by a Poisson distribution (Richardson, 1960).

For the social scientist, no less than the natural scientist, our view of reality is given us through our instruments--through our methods. This is most obvious when the same aggregate data will yield different and sometimes contradictory results, depending only on slight changes in technique, as for example, using different communality estimates in common factor analysis or different rotation criteria. For this reason, among others (Popper, 1965a), application of methods and choice of units should be dictated by clear hypotheses and theories.

laws.⁷ Predict international relations? Absurd.⁸ Who could have predicted Sukarno's erratic and highly personal actions? Who could have forecast the rise of a Hitler, Stalin, Mao, or Castro? On the other hand, the scholar summing across a number of actions, standardizing them, and comparing across countries and years knows he has strong relationships.⁹ His correlations often exceed in magnitude those of the other social sciences and leads him to be impatient with the belief in the unpredictability of human behavior.

Certainly, both the individual and aggregate perspectives can complement and supplement each other. Aggregate level research contributes an understanding and a conceptual framework of the context within which individual actions take place. It can define the direction of aggregate behavior, the range of alternative directions (alternative worlds), and the crucial variables (such as energy consumption or national income) whose shift in values might provide calmer waters for the ship of state.

For the scholar, the practitioner's world should be the testing ground of aggregate research and theory. While study can proceed at the aggregate level, international relations, after all, consist of the actions

⁷"To concentrate attention on matters we can predict is to give less attention to matters we can effect." (Fisher, 1969, p. 2)

⁸"The political behaviorists are wrong in their belief that a knowledge about political processes as gleaned from case studies and refinements in theory will enable us to predict policy outcomes (e.g., Richard Snyder's study 'The U.S. Decision to Resist Aggression in Korea.') The fallacy in their position is that it does not take sufficient cognizance of the degree to which decisions are based on contingent factors that vary from one case to another. 'Discretion is an ineradicable element of decision-making, and the limits set to reducing it are narrow.'" (Eula, 1959, p. 158)

⁹One example of this regularity relevant to the aggregate-individual distinction has been reported by Russett (1967, p. 92) for UN voting. "On these major issues in the United Nations, the importance of idiosyncratic and role variables is slight--changes in the person or even party of the major decision-makers made little difference in nations' alignments."

and problems of people. It is at the practitioner's level that the crucial tests of the aggregate perspective must be applied. For of what use are concepts of integration and social distance, correlations between trade and economic development, dimensions of size and foreign conflict behavior, and nearly perfect multiple correlations, if they give no guidance to human affairs, solve no problems, provide no solutions?

This long introduction is to set the stage for the field theory of U.S. conflict and cooperation to be presented and tested here. For this will use an aggregate level perspective with which most will be unfamiliar.¹⁰ It will treat international relations as a deterministic system and pose within the representation to be developed a fundamental proposition of foreign relations. As applied above, while the discussion from this point on will develop an aggregate theory, it is recognized that an individual world of everyday actions and decisions exists and that ultimately the ability to solve some of the problems of this world will be the final test by fire.¹¹

¹⁰Field theory is not only unfamiliar, in the sense that few are acquainted with it, but it is also unfamiliar in not employing the usual substantive concepts or models (such as game theory, probability, or calculus). It is a geometrically-oriented theory with most of the technical concepts drawn from linear algebra.

¹¹This paper represents part of a long range research project. The eventual aim is to develop the ability to forecast the areas and intensity of conflict and cooperation and the nations involved. The "test by fire," then, will be the ability to make accurate forecasts and the usefulness of the forecasts, if correct, to practitioners and policy makers in international relations. If aggregate work in international relations can be likened to theoretical meteorology, then as the meteorologist must use his knowledge of gross weather patterns to say something about rain or snow over Detroit, if his theory and methodology are to be tested in practice, then those of us at the aggregate level should also eventually say something specific about future--not past nor present--behavior.

Most attempts to develop aggregate theories of nations' actions have worked at a conceptual level not far removed from that of diplomats, politicians and journalists. Power, national interest, nationalism, conflict, cooperation, integration, international law, international organization, politics, geographic distance, regionalism, threats, war, etc., etc., are usually the major ingredients of aggregate theories. Like sociology, economics and psychology, international relations has been gifted with men like Karl Deutsch, Ernest Haas, Morton Kaplan, Charles McClelland, Lewis Fry Richardson, Bruce Russett, J. David Singer, and Quincy Wright, who with great insight wove such concepts into theories. It is to their credit that their insights have expanded our understanding and research in international relations. It does not detract from their contribution if we now build on their efforts by shifting our conceptual framework to a new plane further removed from daily affairs, and one that introduces constructs¹² and imbeds traditional concepts like power within an explicit logical framework allowing deduction and falsification by observation.

Decades ago, Arthur Bentley (1945) observed that the study of human affairs could benefit from thinking in terms of a social space-- like physical space with dimensions, movements, locations and spatial

¹²"The passage to orderly knowledge involved the positing of constructs, which are the rational elements to which data experience is made to correspond. An external object is the simplest construct which we habitually set over against most kinds of sensory awareness. Others are geometric forms, numbers, and most of the refined entities of modern physics. Invention of a construct does not carry with it the assurance that the construct is scientifically acceptable or that it is part of reality." (Margenau, 1950, pp. 72-73)

relationships.¹³ Social space, however, would define man's social world not in terms of physical location, but in terms of his characteristics and behavior. Others, such as Sorokin (1943), have since employed the concept of social space. Tolman (1951) has proposed a behavior space comprising individuals, their behavior and perceptions. Parsons' theory of action explicitly conceives of a social space, with his pattern variables being the dimensions of this space. Lewin (1964) has in his field theory proposed a life space of social behavior--a topological space which defines the context of behavior. And Dodd (1947) has built a complex notation describing "societal phenomena" in a social space.

Influenced by the theoretical works of the sociologist Parsons and psychologist Thurstone (1935), Quincy Wright was the first international-relations theorist to represent international relations as a social space in Bentley's sense, which Wright calls an analytic field.

The analytic field approach to the study of international relations ... implies that each international organization, national government, association, individual or other 'system of action,' or 'decision maker' may be located in a multidimensional field. Such a field may be defined by co-ordinates, each of which measures a political, economic, psychological, sociological, ethical, or other continuum influencing choices, decisions, and actions important for international relations. (1955, p. 543)

¹³The idea of space and concepts related to it play a large role in our language. Hall (1969, p. 93) found that twenty percent (!) of the words listed in the pocket Oxford dictionary referred to space. Given this proportion, only systematic bias could have held back greater use of the idea of space in the social sciences. In international relations, I would suggest this bias is an individual-centered, historical event-oriented paradigm.

It is important to point out, however, that space is not a concept that one comes to by "unbiased" observation or by abstraction. "None of our sensations, if isolated, could have brought us to a concept of space" (Loisore, 1952, p. 58) We posit space as a construct. It is an imaginative construction that helps us order observations. (Margenau, 1950, pp. 127-128)

Wright went on to specify what these coordinates might be and to locate nations in the resulting space on the basis of subjective estimates. Much of the factor analytic work in international relations,¹⁴ as Wright suggested could be done,¹⁵ has been implicitly filling in Wright's analytic field with coordinates (dimensions) based on aggregate data.¹⁶

The representation of international relations as a social space is powerful. It enables the systematization of observations, the development of mathematical theory tied to methods for testing, and the picturing of the relationships involved. A social space of international relations will be the first aggregate construct I will use in representing U.S. foreign actions.¹⁷

In developing this social space notion, one metasociological assumption is relevant. Let us assume that in explaining the behavior of nations

¹⁴For a bibliography of such work, see Rummel (1970a).

¹⁵What continua can most usefully be employed as co-ordinates for defining this analytic field? The problem is similar to that of determining the factors which account for mental performance, studied by psychologists. E. S. Spearman assumed a single factor, E. L. Thorndike assumed a great number of independent factors, and L. L. Thurstone devised methods for determining the minimum number of factors necessary to account for the results of numerous tests of mental ability." (Wright, 1955, p. 345)

¹⁶Surely, international relations or any other social behavior involves the complex interworking of a large number of variables in a social situation. Wright, however, just posits the field (space) and the elements within it. He does not indicate how they are functionally related. "The problem of combining factors is not automatically solved by formulating the combination in terms of a field theory. We do not obtain such a theory merely recognizing a multiplicity of factors and treating them as constituting a phase space How the factors combine in their working must still be specified." (Kaplan, 1964, pp. 325-6)

¹⁷This is not a static space, but is considered to be made up of social-time dimensions. Time is considered relative from the point of view of the nation involved and to be multidimensional. Since the tests to be developed here are for one period, however, the social time aspect will be ignored. Data collection is now underway for a number of time periods and when completed will enable the social-time nature of this space to be made explicit. Those interested in the philosophical and mathematical aspects of time in this context, see Rummel (1970c).

the principle of relative values operates. That is, the behavior and attributes of nations are relative. It is not the absolute economic development nor power of a nation which should be taken into consideration (most nations today are more developed and powerful than any one nation two hundred years ago), for example, but its relative power *vis-à-vis* some explicit other nation.¹⁸ And the action of one nation to another should be considered in relation to its other actions, as well as in relation to the object's behavior and that of all other nations.¹⁹ As we shall see, the notion of social space allows the principle of relative values to be simply incorporated.

First, consider that the foreign actions and attributes of the U.S. are part of the social space of nations. The U.S. then is located in this space in terms of its actions to other nations and its relative attributes. Second, conceptually divide the social space into behavior and attribute

¹⁸Such regard to the relative nature of military power, for example, Falls (1962, pp. 18-19) says that "since the sixteenth century it would be hard to find any period of fifty years at the end of which an army, with contemporary weapons and tactics, could not with ease have utterly destroyed an army with those of the start of the half-century. This is almost equally true of naval fleets, and recently at least was true. In air warfare the transformations which render obsolete equipment and tactics take place every six years at the longest."

There is some disagreement whether power is a relation or a property of an actor. I obviously define power as a relationship, as have Lasswell and Kaplan (1950, p. 75). "Power is here defined relationally" Easton (1953, pp. 143-6), power is a relational phenomena "based on the ability to influence the actions of others;" and Morgenthau (1954, p. 142), the first error that nations can commit in evaluating power is to disregard "the relativity of power by erecting the power of one particular nation into an absolute."

¹⁹The point of view developed here and given mathematical structure later is simply that the behavior of one nation to another takes place in a context (or field) which includes the actions and attributes of other nations. This view is close to the "situational perspective" of Strauss-Lurçat and Pottery who, in their general theory of foreign policy, assert that "the analysis of the relationships between ten to twenty nations is the absolute minimum for the adequate description of the international situation." (1954, p. 41, italics omitted)

subspaces.²⁰ The attribute subspace, which will henceforth be called attribute space, defines the location of the U.S. (and other nations) in terms of her relative values on all her attributes and the intercorrelation between these attributes for all nations. The origin of the space lies at the average values for the attributes. Thus, the GNP, area, population, defense budget, censorship, number of political parties, number of riots, number of Roman Catholics, etc.,²¹ of the U.S. will locate her in this space relative to the values that other nations, the potential objects of her actions, have on these attributes.

As in physical space in which all the notions and spatial relationship among things are defined by three physical dimensions (ignoring time), the relationship between attributes and relative location of nations in attribute space is defined by a number of dimensions.²² Figure 1 shows the U.S. and five potential objects of her actions located in attribute space on two dimensions,²³ called economic development and power bases. These two dimensions have repeatedly been delineated in attempts to define

²⁰These are not linearly independent subspaces. As we will see later, the behavior subspace is contained in the attribute subspace.

²¹Note that I am dealing with aggregate attributes, that is, characteristics on which nations can be scaled, observations summed, or statistics collected. This would also include survey or polling data, were they available for a number of nations. Thus, to reiterate, the theory being developed is at the aggregate level and not to be confused with conceptual frameworks at the individual level.

²²It is common for sociologists to say that society is a many-dimensional field. What the social dimensions are, or more properly what the most important social dimensions are for any specialized line of investigation, is our sociological problem in general. The search for precision in their analysis and use is the sociological space problem. (Bentley, 1954, p. 94)

²³Attribute space appears to be at least ten dimensional (Pumel, 1969c), but for pictorial simplicity only two are shown.

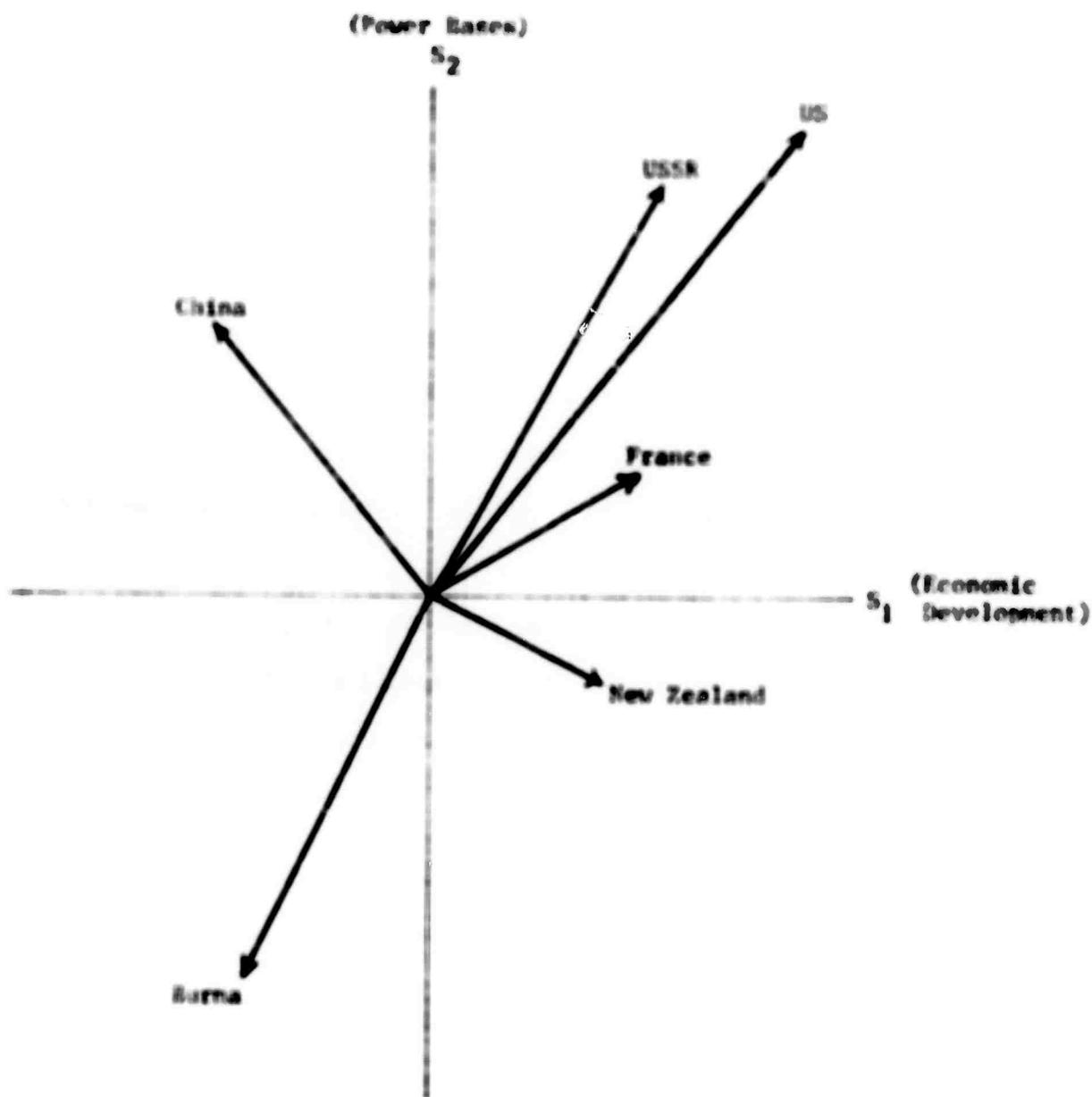


FIGURE 1

the attribute space of nations as the comparison of a number of studies has shown (Russett, 1967²⁴; Rummel, 1969c). Attributes most highly correlated with the economic development dimension are energy consumption per capita, telephones per capita and gross national product per capita. Those elements most correlated with the power bases dimension are national income, population, area, men under arms, and size of the defense budget. Not shown in Figure 1, but a third major dimension found to define attribute space is political orientation, which is highly correlated with censorship, freedom to oppose the government, and proportion of communist party members. The three dimensions together--economic development, power bases, and political orientation--subsume over forty percent of the variation of nations on their attributes.

Keeping attribute space in mind, for the moment, let us move to a second basic construct (where the first is social space), that of dyad. A dyad is a coupling of two nations together in terms of the actions of one to the other.²⁵ It is an actor-object pair of nations. In terms of U.S.

²⁴ Russett names the power bases dimension "size."

²⁵ Much of the aggregate analysis, theory, and research in IR is on the characteristics and behavior of the nation itself and not on the nation in relation to some particular other one. The concern is with the policy of the nation, the development of the nation, the conflict behavior of the nation, the relationship between the nation's trade and development, or internal unrest and foreign conflict, or power capability and foreign policy. Yet, we know that a nation's policies and behavior shift depending on the object nation, and whether development, power, or any other variables are relevant will also shift by object. For example, economic development is a more important aspect of the U.S. in relation to India, while with China power is the most salient. For Canada-US relations, however, neither characteristic appears as important as short run diplomatic-political considerations.

Students of international relations share with their fellow social scientists this monadic lock-in--this over emphasis on the individual, group, or nation. Kaplan (1964, p. 323) has commented on this tendency. "I believe that one of the sources of this tendency is the image of the self as monadic. The principle of local determination may appear to us to be naturally and necessarily true of our own behavior, as a reflection of

actions, US-China, US-USSR, US-Greece, are such dyads, where each object is coupled separately with the U.S. by U.S. actions toward it.

The concept of dyad now allows the behavior of nation's subspace, henceforth to be called behavior space, to be defined. Behavior space locates all dyads relative to each other in terms of their²⁶ behavior actions. The principle of relative values is involved here also, where the origin of behavior space lies at the average values for each behavior (such as threats). Figure 2 shows the relative position of five dyads involving the U.S. as actor on two behavior space dimensions, exports, and official conflict behavior.²⁷

²⁵(continued)

our sense of individuality and freedom. It is easier for us to accept a theory of behavior with complex predicates than one which introduces complex subjects for its propositions. The subject of a theory of behavior may be complicated, but not complex - it is just 'me', a unitary self." On the tendency of social-psychologists to think monadically, see Sears (1951, p.469)

This distinction between monad and dyad also is salient to the ontological perspective of the field theory presented here. "A classification of theories ... is that into field theories and monadic theories. A theory may take as fundamental a system of relations among certain elements, explaining the elements by reference to these relations, or it may give primacy to the relate, explaining the relations by reference to attributes of what they relate Thus a theory of personality in terms of roles might be contrasted with a theory in which roles are explained by reference to sets of needs of the individual personalities participating in the social process." (Kaplan, 1964, p. 301)

²⁶Since a dyad, say US-China, is considered a unit, it can be treated as a point or vector in behavior space and manipulated mathematically as any single unit. To speak of the behavior of dyads, therefore, is to mean elliptically the behavior of specific actors to certain objects.

²⁷See Rummel (1969c) for a discussion of how such dimensions were derived and the other dimensions delineated. Behavior space also appears to be at least ten dimensional.

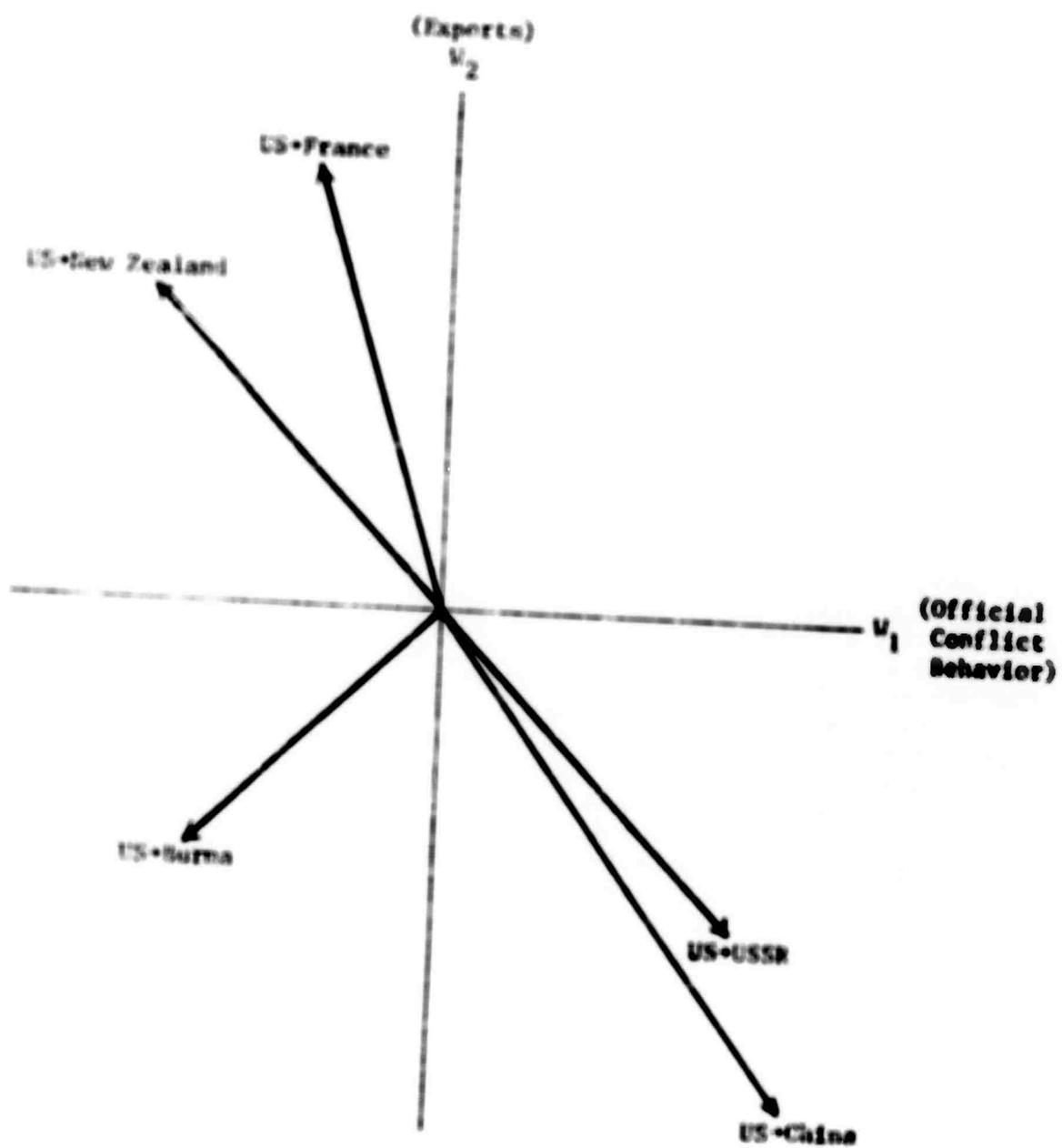


FIGURE 2

So far, I have proposed an aggregate level representation of U.S. actions and attributes as existing in a social space, conceptually divisible into attribute and behavior spaces, and embodying the principle of relative values and the concept of dysds. This representation can now be used to tie together six hypotheses about a nation's international relations.

The first hypothesis is that the foreign behavior of a nation is linked to certain characteristics of a nation, specifically its economic development, size, and political system (whether the polity is open or closed). This hypothesis is from Rosenau's (1966) building block, which he calls the "pre theory" approach²⁸ to tying together international relations and comparative politics. For Rosenau, the three characteristics are basic for understanding the outputs of a nation. In particular, the profile a nation has on these characteristics will determine the ranking of idiosyncratic, role, governmental, societal, and systemic variables in

²⁸The same bricks and lumber can be used to build houses or factories, large structures or small ones, modern buildings or traditional ones. So it is with the construction and use of social theories. There must be, as it were, pre-theory which renders the raw materials comparable and ready for theorizing. The materials may serve as the basis for all kinds of theories--abstract or empirical, single- or multi-country, pure or applied--but until they have been similarly processed, theorizing is not likely to occur, or, if it does, the results are not likely to be very useful." (Rosenau, 1966, p. 40)

This "pre-theory" has been the focus of two conferences. One of these has been summarized (Rosenau, 1967) and the papers presented at the other have been published (Rosenau, 1969).

explaining the outputs.²⁹ Rosenau does not specify the manner of this linkage, for clearly he is trying to present concepts and considerations that a theory can incorporate and not a theory itself, nor does he consider how such a linkage might be tested. In other words, the hypothesis is open for considerable interpretation, and this we will do later.

The second hypothesis has to do with the concept of distance, as it has been applied in the social sciences to explain behavior.³⁰ The basic idea is that the similarity between people in socio-economic and cultural activities determine behavior; that prejudice is a function of dissimil-

²⁹ Suffice it to note that the potency of a systemic variable is considered to vary inversely with the size of a country (there being greater resources available to larger countries and thus lesser dependence on the international system than is the case with smaller countries), that the potency of an idiosyncratic factor is assumed to be greater in less developed economies (there being fewer of the restraints which bureaucracy and large-scale organization impose in more developed economies), that for the same reason a role variable is accorded greater potency in more developed economies, that a societal variable is considered to be more potent in open polities than in closed ones (there being a lesser need for officials in the latter to heed nongovernmental demands than in the former), and that for the same reason governmental variables are more potent than societal variables in closed polities than in open ones." (Rosenau, 1966, p. 45)

³⁰ For a review and bibliography of social science research and theories using distance as a concept, see Olssen (1965). Geographical distance is the main focus of Olssen's review and his primary scientific concern is regional economics.

arities in characteristics and that interaction is the greater the more homologous the people.³¹

The concept of distance has been employed by Quincy Wright to define the relationships between nations (1955, p. 127), and particularly to develop a model of the probability of war.³² He proposes that the relations between two nations is a function of eight distances. Technological, Strategic, Psychological, Political, Social, Intellectual, Legal, and Expectancy. (1964, p. 332) He combined these distances in a differential equation, subjectively estimated the eight distances between the great powers in July 1939, and found that the "relative probability of war at that date was highest for Japan-USSR (.96), Germany-USSR (.86), and

³¹Distance in the work of Bogardus (1925, 1933) and his followers (Landis, *et al.*, 1966; Van Den Berghe, 1960) is an attitudinal distance--called social distance--and the distance is measured by the degree to which one is willing to enter into a variety of relations with and be spatially close to another person. Social distance defined in this way has mainly been employed to study racial prejudice. Social distance has also a different meaning that developed in much of the sociological research on marriage: as the dissimilarity in the characteristics of two people (Parkman and Sawyer, 1967; March, 1967, pp. 93-4). It is in this sense that I have used the concept of social distance in the past (Rummel, 1969b). Unfortunately, the concept of social distance is confusing in two ways. One, as suggested above, it is not often clear whether the desirability of social relations or dissimilarity in characteristics is being referred to. Second, in any case, social distance seems to restrict the concern to purely social characteristics or behavior, when what is meant is the distance on all characteristics, political, cultural, military, economic, psychological, as well as social. Therefore, to avoid this confusion in the future, I will use the term "attribute distance" to refer to the dissimilarity of two nations in their characteristics.

³²When Wright's notion of distance is interpreted as "difference" or "relative value," then it can be seen that he is not presenting a new concept to students of international relations. Others, such as Strausz-Hupé and Possony (1954), have pointed out the importance of differences in outlook, social structure, and culture in understanding conflict between nations. Wright's contribution is in the specific nature of his discussion of distances and in the relationship he explicitly poses (and tests) between distances and

Germany-France (.82)" (1964, p. 348). This work of Wright and the general connections between behavior and such distances suggest the hypothesis that the actions of nations are a function of a variety of distances between them.

The third hypothesis has to do with social stratification. Following the work on class and stratification in sociology,³³ Johan Galtung (1964) and colleagues (Galtung, Araujo, and Schwartzman, 1966; Schwartzman, 1966; Gleditsch, 1969) have defined the international system as a status system in which nations are located on status dimensions. They then propose that the behavior of nations to each other is a function of their relative status positions. For example, if wealth, power, and prestige are status dimensions of international relations, as proposed by Lagos (1963), then the behavior of the US to the USSR will be a consequence of the relative profiles of the US and USSR across these three status dimensions. The third hypothesis is then that the actions of one state to another is a function of their relative statuses.³⁴

³³For example, see the work of Lenski (1966), Merton (1957) and Homans (1961). Homans (p. 150) is the clearest in defining status. It "is a matter of perception, and of perception that puts stimuli in rank order." He points out (p. 149) that the "stimuli that make up a man's status include the kinds of reward he receives--among them his esteem itself--the kinds of activity he emits, and anything else about him, like the kind of clothes he wears or the kind of house he lives in, provided that these stimuli are recognized and discriminated by other men. To serve, moreover, as the sorts of stimuli that determine a man's status, people must be able to rank them, in comparison with the stimuli presented by other men, as relatively 'better' or 'worse,' 'higher' or 'lower.' "

³⁴The hypotheses being discussed here overlap considerably. For example, in Rosenau's "pre-theory," he proposes (1966, pp. 82-3, 87-88) that four major issue areas vertically divide interest and activities within nations and from the nation to the international system. And one of these issue areas is status.

The fourth hypothesis has to do with the central thesis of international relations: the configuration of power among nations determines their policy and behavior. That power considerations structure international politics has been attested to by scholars and practitioners alike. That power is basic is a fact of practical experience and scholarly study. That power is measurable, constrainable in equations, and a concept leading to testable predictions of nation behavior, however, has not at all been established.

One of the more explicit theories of power has been offered by A.F.K. Organski (1960). He argues that nations are ranked in a power pyramid and that the international order is largely shaped by those at the top of the pyramid. International conflict then comes about when a nation lower down in the pyramid is changing in its power in a way to threaten to displace the more dominant nation and when there are few bonds to tie the two nations together. For Organski, international politics is shaped by the relative and changing power between nations and the bonds that bind them.³⁵ This

³⁵In general terms, Organski's position is not much different from other scholars. Although few would accept Morgenthau's (1954, p. 25) blanket "International politics ... is a struggle for power," many would agree with Liska (1956) that international politics is reducible to an interplay between politics and norm. By norm is meant in part the values associated with cooperative bonds.

In specifics, Organski disagrees with much of the literature. He casts out the sacred balance of power theory and argues that a large power imbalance promotes peace; power parity promotes war; the dominant nation is a secure and peace-loving nation. Oblique evidence for this view comes from the content analysis of Ithiel de Sola Pool (1951, p. 62). He found that hostility "to the outside world, as measured by our data, seems to be very much a function of insecurity. Those nations which have at any given moment dominated the world scene have generally said little that was adverse in 'prestige papers' to the other powers. The insecure or unsatisfied powers, on the other hand, have generally had editorials full of hostile judgments of foreign states. This shows up by a comparison of the papers in the different powers and perhaps also by a comparison of trends. As a power has declined in world position, the editorials coming from it tended to become more critical of the outside world." The basic difference in these findings and Organski's position is in the direction of change promoting conflict. For Organski, the nation increasing in power, not decreasing, relative to the top dog is the source of conflict.

theory, then, suggests the fourth hypothesis: a nation's conflict and cooperation with another nation are results of their relative power and cooperative ties.

The next hypothesis embodies the general orientation of those work-
ing on international and regional integration (Kussett, 1961, 1967; Deutsch,
et al., 1957; Jacob and Juncos, 1964). The fundamental notion is that the
interaction and cooperation leading to political integration result from,
among other things, a high level of social and cultural homogeneity, simi-
larity in political attitudes and values, and geographical proximity.
Metaphorically, like marry like. Based on this perspective, the sixth
hypothesis is that the relative cooperation between nations is related to
the degree of similarity between them and their geographical distance.

To assert that geographical distance conditions international
relations is trite. To specify how it does so is no easy matter. (Wohlstetter,
1968) Does geographical distance influence the relations between nations as
astronomical distance between planets in conjunction with their mutual
gravity influences the relative motion of planets?³⁶ Does geographical
distance only set up boundaries of behavior (Sprout and Sprout, 1962)? Or
does distance provide a gradient of behavior (Reulding, 1962)? Rather than
adopt any of these alternative functions at this point, I will make explicit
the general hypothesis: the relations between nations are conditioned by
the geographical distance between them.

To recapitulate, the six relevant hypotheses of international rela-
tions are:

- (1) foreign policy behavior is a function of economic development,
size, and political system;

³⁶See Cotton (1965) for a discussion of social "gravity."

- (2) the behavior of one nation to another is a function of distances;
- (3) the behavior of one nation to another is a function of relative status;
- (4) a nation's conflict and cooperation with another nation are results of their relative power and cooperative ties;
- (5) the relative cooperation between nations is related to their homogeneity and geographical distance;
- (6) the relations between nations are conditioned by the geographical distance between them.

To connect these hypotheses and using the social space representation, I propose the following law-like field theory proposition: the relative behavior of one nation to another is a linear function of the distance vectors between them on the dimensions of attribute space.³⁷ This law in conjunction with the social space representation and the principal of relative values discussed above is what I call a field theory of social action. The axioms and mathematics of the theory have been developed

³⁷Such a law-like statement of international relations may seem presumptuous, and perhaps arrogant, and certainly without empirical foundation. Since no such law has been established yet (this is why it is called "law-like"), I could avoid this impression by speaking of "generalization," or at a more acceptable level, "hypothesis." But, this would not communicate the explanatory strength I am according the statement, unqualified as to nation, time, or place, and that it has considerable explanatory power. I am not implying that it is based on invariant research results. I am proposing it as a law yet to be largely tested, but as one upon which effort should be focused. To publicly state this as law-like is to invite criticism and a great deal of effort to disprove the assertion. But this is what I seek, for science advances by making our assertions definite and public and by the subsequent attempts to qualify and to falsify them.

Many feel that scientific laws do not exist in the social sciences. For a discussion of this feeling and several examples of such laws, see Popper (1965b, especially p. 102).

elsewhere.³⁸ The interest in this paper is to apply it to U.S. conflict and cooperation.

How can the field theory proposition subsume the six appropriate level hypotheses of linkage, status, distance, power, interaction, and geographical distance? First, the proposition links the dyadic behavior (the actions of one nation to another) to their attributes. Applying this law to the U.S., the equation expressing this linkage is

$$v_{US-j,k} = \sum_{i=1}^p a_{US,i} d_{i,US-j} \quad (1)$$

where $v_{US-j,k}$ is the projection of the behavior of the U.S. toward nation j on the k th dimension of behavior space, $d_{i,US-j}$ is the distance (difference) vector between the U.S. and nation j on the i th attribute dimension of attribute space, and $a_{US,i}$ is a U.S. specific parameter weighting the distances.

Second, the proposition asserts that relative dyadic behavior is a resolution of the weighted attribute distance vectors that distances are forces determining the behavior of nations toward each other.³⁹ Figure 3 may help to make this linkage clear. These distances operationalize the

³⁸See Fummel (1965). For a more recent and somewhat revised exposition with tests, see Fummel (1969b). The mathematical relationship between what I call attribute theory--the attempt to relate the total behavior of a nation to its attributes--and field theory is discussed in Fummel (1969a). For an application of field theory to a study of Asian conflict and cooperation, see Park (1967). For an application of field theory to the regional economics of India, see Berry (1966). For a theory of behavior using a behavior space conception and overlapping in axioms with field theory, see Phillips (1969).

³⁹To avoid misunderstanding, I should reiterate that behavior and attributes in the aggregate are being related. If the aggregate character of this proposition is kept in mind, then the deterministic flavor of the discussion should be more palatable.

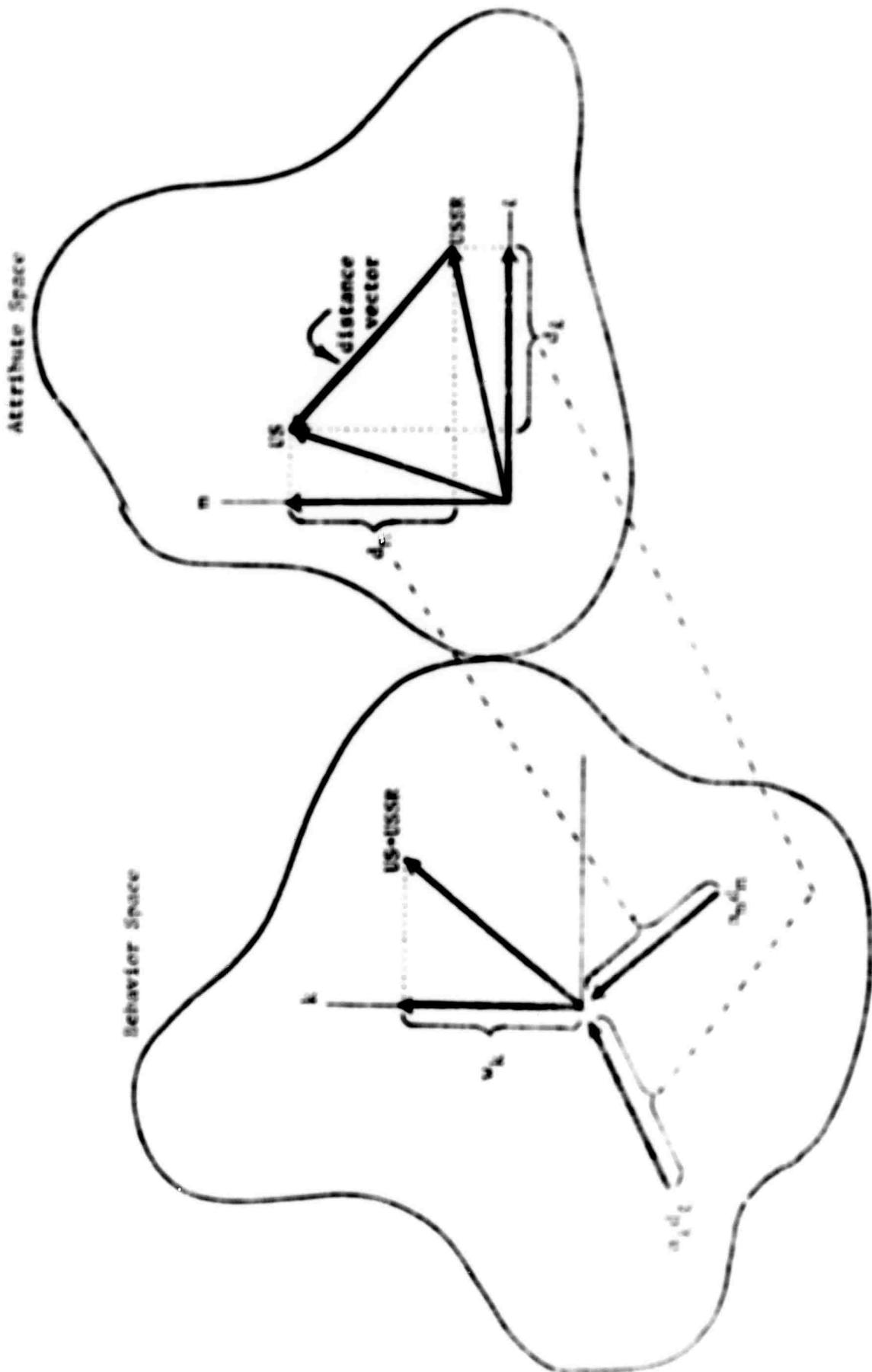


FIGURE 3

notion of relative values and of differences and similarities between nations that is at least implicit in the hypotheses mentioned.⁴⁰ To show how equation (1) can link the hypotheses, each of the six will now be made more explicit.

With regard to the linkage hypothesis, Rosenau specifies economic development, size, and political system (open or closed) as important characteristics in understanding the foreign behavior of a nation. As mentioned above, in research done to date to identify the dimensions of the attribute space of nations, economic development, power bases or size, and political orientation have consistently emerged. The political orientation dimension is very close in content (censorship, freedom of groups to oppose the government) to Rosenau's open-closed distinction.

A problem is defining how these three dimensions relate to behavior. If we take an attribute theory approach (Russett, 1969a),⁴¹ then we would say that for the U.S. its values on these three dimensions influence its conflict and cooperation. A careful reading of Rosenau, especially how he

⁴⁰It is necessary to be explicit about the basis of any assertion of similarity or difference between nations. For "any given finite group or set of things, however variously they may be chosen, we can, with a little ingenuity, find always points of view such that all the things belonging to one set are similar" (Pepper, 1969a, p. 422) This point has been logically proven for the converse (all things are different) by Matanabe (1969, pp. 376-379) in his "theory of the ugly duckling."

⁴¹An attribute theory is defined as one which tries to explain the variation in behavior of a nation in terms of its characteristics, without reference to other nations. For example, the theory that the involvement in foreign conflict of a nation depends on its internal stability is one. Attribute theory is in contrast to field theory which states that the relative differences and similarities between two nations affect the behavior of one to the other.

makes decision making centers dependent on the profile of nations on these dimensions and relates this to "issue areas,"⁴² implies that the behavior of the U.S. toward other nations will vary depending on the differences between them on these dimensions.

Finally, Roseau's stimulating concept of issue area implies that actions of nations cluster around certain issues (such as the cold war). That is, that there are distinct dimensions of nation behavior along which nations vary in their relations with each other, and, tying in the previous paragraph, they will vary in their behavior toward each other depending on their differences in economic development, size, and political system. Since differences between nations are defined by distance vectors, this suggests the following.

Lihsue proposition: Distance vectors on the dimensions of attribute space which define economic development, size, and political orientation will contribute the most in accounting for the relative actions of the U.S. toward other nations on the dimensions of behavior space.

Looking now at the status hypothesis, I have stated that among the major dimensions of attribute space are economic development and power bases.⁴³ These are consistently the largest dimensions found to define the space and

⁴²See footnote 29.

⁴³Power bases and size are alternative labels for the same dimension of attribute space. These labels are possible by virtue of the high relationship of measures of power capability to the dimension on the one hand and the high relationship of measures of size, such as area and population, on the other.

can be considered the two status dimensions of wealth and power.⁴⁴ Prestige, a third status dimension, can be assumed dependent on the other two, as has been argued by Lagos (1963) and Lenski (1966)⁴⁵ and shown by Swartzberger and Araujo (1966) and Shimbori, et al. (1963).

Now, the U.S. has high status on both dimensions of economic development and power. Following status theory (Galtung, 1966), we would therefore expect the U.S. to direct more cooperative actions toward other high status nations--to be more 'associative' in Galtung's words--than toward nations that are of low status. That is, cooperative actions directed toward other nations should be inversely proportional to the distances from them on the two status dimensions.⁴⁶ Let CO denote the cooperative acts of the U.S. toward an object nation, ED denote distance (difference) between the U.S. and object nation on economic development, and PD distance on power bases. Then, this

⁴⁴ Which characteristics become the basis for stratification ... depends on what is considered particularly important by the stratifying society" (Denzon and Steiner, 1964, p. 455). And, according to Williams (1947, p. 55), the main classes of scarce divisible values are: wealth, power, and prestige within a given culture." Specifically with regard to nations, Lagos (1963, p. 9) says that "economic stature, power, and prestige ... constitute the status of a nation."

⁴⁵ With respect to individual prestige, the evidence suggests ... prestige seems largely a function of power and privilege" (Lenski, 1966, p. 431).

⁴⁶ It is possible to operationalize status difference in this way because the U.S. is high on both status dimensions. As long as we do not calculate distance on both dimensions, but treat distance on each dimension as a separate variable, then (1) if the distance of the U.S. from object nation is near zero on both dimensions, they both have high status; (2) if distance on one dimension is low and on the other high, then they have one status in common; (3) if both distances are high, then they have different status. In this paper, status is treated as a matter of degree since its measure--distance--is a continuous variable.

Also, distance is a vector here and not simply a magnitude. However, since the U.S. has top values on economic development and power bases, the results for the U.S. are invariant of whether distances on these dimensions are treated as a magnitude or vector.

part of status theory states that

$$aCO = -ED - PE + b \quad (2)$$

where a and b are constants, a is positive, and ED and PE are presumed to have equal weight. In words, the more similar the U.S. and object are in economic development and power bases, the more cooperative the actions the U.S. directs toward the object.

There is another, perhaps more exciting, part of status theory, to wit, that the conflict between two nations will be a consequence of status disequilibrium.⁴⁷ Relations between them will be most cooperative if they both have balanced profiles on their status, say both high. Both low, or one nation high across the status dimensions and the other consistently low. If, however, one or both of the nations are unbalanced on different status dimensions, then the tendency is toward conflict as one or both try to balance their status upward and thus threaten the dominance of the

⁴⁷The concept of status disequilibrium, or imbalance, inconsistency, or crystallization has provoked considerable research in sociology. See for example Lenski (1966), Segal (1969), Mitchell (1964), and Homans (1961). The basic idea is that a person unbalanced in his status will be under stress, inducing him to act in a way to balance his status. For example, he may, as Lenski believes (1966, p. 82), be more likely to "support liberal or radical movements designed to alter the political *status quo* than are persons of consistent status." Not all the evidence on the political consequences of unbalance was consistent until Segal (1969) showed that the relevance of particular status under certain political circumstances have to be taken into account. Most of this work has been done treating the status of an individual and his overall behavior. Little work, with the exception of Homans (1961, p. 248) who defines status congruence in terms of two individuals, has been specifically concerned with the behavior between two persons in terms of their relative ranks. One of the contributions of Galtung is combining a number of ideas and results from the status literature to discuss dyadic relationships.

other.⁴⁸

Since the U.S. is high on both status dimensions, imbalance will exist when another nation is close to the U.S. on one and far on another, such as China who is much closer to the U.S. on the power dimension than on economic development. It seems most likely that conflict will result when both the U.S. and object nation are jointly high on power--have power parity, so to speak--and far apart in economic development.⁴⁹ Power, then, provides the resource for conflict, differences in economic development, then, provide

⁴⁸As Galtung (1964) points out, his theory of status disequilibrium contradicts the criss-cross theory of conflict: nations that have no status in common should have more conflict than those that have one status alike, since the one status provides a cross-pressure--a bridge between them--that dampens conflict. Singer and Small (1966) have applied this theory to international relations with results supporting it. The empirical results to be described here also bear on this theory.

⁴⁹If economic development is considered an achieved dimension--(one on which nations can be high by dint of policy and hard work)--and power ascribed--(one in which nations are high by virtue of elements they have little control over today, such as area, population size, resources), then the imbalance on the achieved dimension could be especially conducive to conflict. It is along this dimension that evaluation of the ability of a nation is likely to take place and the dimension on which the nation can most mobilize its resources to move upward.

That status disequilibrium leads to conflict, especially if the imbalance is on the economic development dimension, can be explained by drawing on a point made by Burton (1962, p. 71). "The 'characteristic feature of an actor-object relationship (which he calls an S-R relationship)' is that hostility emerges finally through frustration experienced by one party because of lack of adjustment by the other. The conflict does not result from change as such, but from the restraints imposed on R by the countries affected. Industrialization or a new philosophy does not cause hostility, but hostility occurs in the first place when resistance is met which limits potential or anticipated developments.

many of the issues for conflict,⁵⁰ and the threat to the dominance of the U.S. is implicit in the greater power the other nation will have as it attempts to narrow the economic development gap and balance itself on these two status dimensions. This aspect of status theory can be put into an equation, denoting conflict by CF,

$$dCF = ID - PB + e, \quad (3)$$

where d and e are constants, d is positive, and ID and PB are assumed to have equal weight. In words, the more the U.S. and object nation are dissimilar in economic development and similar in power, the more conflict actions the U.S. will direct toward the object.

We now have two equations, one for the conflict actions and one for the cooperative behavior of the U.S. The international relations of the U.S., however, are not neatly partitioned this way. Mixed actions are simultaneously directed at the same actor, some conflictful, some cooperative.⁵¹ What then will be the relationship between these actions? Since

⁵⁰The gap between rich and poor nations has come to be the most important issue of international relations. (Patel, 1964) Aside from being an issue, however, whether a nation is rich or poor affects the way it makes foreign policy. The process becomes "bureaucratized," with loss of control by the cabinet and growth in administrative politics. (Morse, 1970) Aside from other considerations, this helps explain why U.S. actions should differ depending on how economically distant the other nation is, since economic distance will measure the level of modernization of the foreign policy process of the other nation.

⁵¹This is consonant with Rosenau's (1966) issue area vertical division of a nation's outputs and Lerche's (1956, p. 147) "single objective conflicts." The U.S., for example, in the same day may be in conference with the U.S.S.R. talking about strategic arms limitation, allowing U.S. tourists to visit the U.S.S.R. and students to study there, exporting machinery there, and warning its leaders that the U.S. cannot stand by and let the Soviet Union unbalance the relative power between Israel and her neighbors in the Middle East.

I might also point out that conflict and cooperation have a logical and sociological relationship to each other. Logically, many kinds of conflict behavior cannot occur unless there is cooperation to begin with. For example, boycotts cannot occur if there is no trade or transaction; diplomatic relations

equations (2) and (3) share some of the same variables, we can determine the relationship between them by adding dCF to both sides of equation (2) and using (3),

$$\begin{aligned} aCO + dCF &= -ED - PB + b + dCF \\ &= -ED - PB + b + ED - PB + e \\ &= -2PB + (b + e) \\ (a/2)CO + (d/2)CF &= -PB + (b+e) \\ gCO + hCF &= -PB + k \end{aligned} \tag{4}$$

where the new constants in (4) are functions of those in the previous equation and g and h are positive. Equation (4) indicates that the joint amount of conflict and cooperative actions toward an object should depend on the power parity of the two nations.

The three equations developed above from status theory can be put into three status propositions.

Status Propositions

- A. The distances of object nation from the U.S. on economic development and power bases dimensions of attribute space will contribute negatively to the relative cooperative actions of the U.S. toward that nation.

51 (continued)

cannot be severed if there are no such relations; and a state visit cannot be cancelled if no visit had been planned to begin with. The sociological relationship is expressed by Coser (1963, p. 85): "The absence of conflict cannot be taken as an index of the strength and stability of a relationship. Stable relationships may be characterized by conflicting behavior. Closeness gives rise to frequent occasions for conflict, but if the participants feel that their relationships are tenuous, they will avoid conflict, fearing that it might endanger the continuance of the relation. When close relationships are characterized by frequent conflicts rather than by the accumulation of hostile and ambivalent feelings, we may be justified, given that such conflicts are not likely to concern basic consensus, in taking these frequent conflicts as an index of the stability of these relationships."

- B. The distance of the object nation from the U.S. on economic development will contribute positively and the distance on power bases will contribute negatively to the relative conflict actions of the U.S. toward that nation.
- C. The distance of the object nation from the U.S. on power will contribute negatively to the joint cooperative and conflictful actions of the U.S. toward that nation.

The third hypothesis must include distances themselves. As indicated previously, Wright suggests a number of distances which affect the probability of war between two nations. Some, such as Psychic and Expectancy distances, may be considered as resultants of distances on attributes and not attribute distances themselves. Most of the others, Social (S), Technological (T), Political (P), Strategic (G), Intellectual (I) and Legal (L) can be related to the dimensions of attribute space. Following the spirit (and not the letter, since we will not use a differential equation and some of his distance relationships are being altered) of Wright's analysis of distances, assuming that Psychic and Expectancy distances are subsumed by the others, and that we can replace his "the probability of war" by the level of conflict behavior (CF), we can render his distance theory by the following equation

$$CF = -aT + bS + cP + dI + fL - dG + e, \quad (5)$$

where all the constants are positive. The equation states that the conflict actions between two nations are consequences of the positive distances of the U.S. on S, P, I, and L and the technological⁵² and strategic similarity of the two.

⁵²: If states are technologically near to one another, disputes will be frequent and dilatory tactics are likely to lead to an accumulation of disputes and an increasing aggravation of relations. Each incident comes to

How can we define the dimensions on which the distance should be measured and imbedded in attribute space? First, by technological distance. Wright means the communication and transportation between two nations. That is, T is part of behavior space. It is defined by those behavior dimensions delineating communications and transactions between two nations as measured by their trade.⁵³ Second, the Social distances can be tapped by those attribute dimensions defining the socio-cultural characteristics of nations, such as Catholic Culture, Equality, Oriental Culture, and Diversity.⁵⁴ Third, Strategic distance which is defined by "right as the vulnerability of attack of one nation by another can be partially measured by geographic distance."⁵⁵ Fourth, Political and Legal distances can be defined by the political orientation dimension of attribute space. Finally, Intellectual distance can be indexed by economic development, since measure of education and scientific (versus legal and religious) interest (such as

⁵²(continued)

be considered in relation to its bargaining value in a general settlement, and it becomes progressively more difficult to settle any issue on its merits." (Wright, 1942, 1256 n. 45)

Berkowitz (1962, p. 168) makes the same point at the group level: "Greater contact between groups does not necessarily promote friendship. Contrary to the oversimplified formulations of many men of good will, bringing people together who have mutually exclusive aims or values usually heightens the chances of conflict. Their coming together produces friction."

⁵³"The technological distances separating pairs of similar countries may be compared over short periods of time by comparison of trade statistics." (Wright, 1942, p. 1244)

⁵⁴These are dimensions of attribute space reported in Rummel (1969b), and listed with indicators in Table 3 below.

⁵⁵Geographic location is theoretically a part of attribute space. In the latest unreported analyses of national attributes directed at delineating the dimensions of this space for 1963, three variables were included in order to define the location of a nation's capital. The resulting attribute dimensions captured this variance associated with location; national distances computed on these dimensions would then subsume geographic distance. For the 1955 results to be used here, however, geographic distance would have to be computed separately from distances on attribute space dimensions.

proportion of science titles published) are highly related to the dimensions (Sumal, forthcoming).

Putting the above correspondences together, remembering that T is now behavior on the communication-transaction dimensions, and letting CF stand for (a linear combination of) distances on the socio-cultural dimensions, we get the revised equation

$$CF = aT + bFD + cP + dSO - eG + p, \quad (6)$$

where a, b, c, d, e, and p are constants and all except p are positive. Now placing behavior on the same side,

$$CF - aT = bFD + cP + dSO - eG + p. \quad (7)$$

That is to say, from Wright we have developed another equation showing the relationship between conflict and cooperation. This time, rather than dealing with joint behavior we have the difference between conflict and cooperation: conflict relative to cooperation will be greater as the indicated attribute distances are greater and geographic distance less. This can be put into the following proposition.

Distance Proposition: The distance vector⁵⁶ of the U.S. from object nation on the social, political orientation, and

⁵⁶No other nation is higher than the U.S. on economic development and on the ordinal rating for freedom of group opposition. Thus, distance vectors and distance magnitudes on each of these two dimensions would be equivalent. However, on Catholic culture and the other socio-cultural dimensions, the U.S. is neither the highest nor lowest. Consequently, if the other nation is higher on the Catholic Culture dimension, then the distance vector will have a negative magnitude and a positive magnitude if the other nation is lower. For distance magnitudes (Euclidean distance), however, both values would be positive.

Why deal with vectors rather than magnitudes? For two reasons. First, vectors allow a simpler representation of field theory and easier mathematical manipulation. They are more pleasing aesthetically and intellectually.

economic development dimensions contribute positively and the distances on geographic distance contribute negatively to the magnitude of conflict actions of the U.S. toward an object nation relative to its communications and transactions with that nation.

The fourth hypothesis is that conflict and cooperation between nations result from their relative power and the ties that bind them. The direction of influence here should be clear. The closer two nations are in their power, holding cooperative ties constant, conflict is more likely. To put this differently, for peace to obtain between two nations, there should be a disparity in power between them. ⁵⁷

⁵⁶(continued)

Second, vectors are a more intuitively satisfying representation than Euclidean distance. It is sensible to say that if a nation is in the middle of a dimension, such as economic development or power, it acts differently to the higher nation than it does to the ones beneath it. To use Euclidean distances is to say that the nation's behavior will be the same to those at the top and bottom, since both are equidistant from him.

The use of distance vectors creates a problem of its own. Theory based on distance vectors cannot be distinguished in the empirical tests to be used here from theory based on the characteristics of the object nation. A proposition that U.S. behavior is a consequence of distance vectors on the power bases dimension will have the same test results as a proposition that U.S. behavior is a consequence of the power bases of the object nation. At some future time a crucial test between the two theories will have to be developed. I am indebted to Nils Petter Gleditsch for pointing out this problem to me.

⁵⁷My interpretation of Organski's power transition theory will do some violence to it, since he is proposing that power change is the crucial variable. However, to enable analysis at this stage in the data collection, I am treating the hypothesis as a static zone and not without justification. A power gap alone creates fear (Berkowitz, 1962, p. 43); the dominant power gets what it wants by the implicit threat of its power and the weaker submits--often unconsciously--to avoid the use of such power. Without a clear gap, however, there is an ambiguity (since statesmen have no precise measure of power). In Coser's terms (1963, p. 247), "when contenders feel that their power is more or less evenly matched, given their common inability to gauge their relative strength more precisely, then the temptation is strong to engage in trial through battle." See also Easton (1953, p. 303)

The theory that power parity makes conflict more likely contradicts the traditional balance of power theory, as expressed by Wright (1955, p. 143): "The greater the number of states and the more nearly equal their power, the

What is meant by binding or cooperative ties? Often, this refers to alliances, treaties, trade, and the like.⁵⁸ These, however, constitute the cooperative behavior that is part of our behavior space--part of the dependent variable, to speak loosely. Therefore, we can say that the object of power parity will depend on the difference between these two kinds of behavior. In symbols

$$CO - CP = +aP = b, \quad (c)$$

where CO is understood to be cooperation on dimensions measuring such cooperative ties as alliances and treaties and a is a positive constant.

Power Proposition: The distance between the U.S. and the object nation on power⁵⁹ contributes positively to the magnitude of cooperative actions (such as alliances and treaties) of the U.S. toward the object nation relative to the conflict with that nation.

⁵⁷(continued)

more stable is the equilibrium." See also Wright (1942, p. 755) Along with Organski, I question the scientific status of the balance of power theory and have sought in vain for anything other than historical narrative and anecdotes to support it.

⁵⁸A case could be made that the bonds between nations are reducible to their relative homogeneity, which has been asserted by Kent and others to be a necessary condition for the successful operation of a balance of power. Homogeneity could mean easier diplomatic exchange and power calculations. On this, see Gulick (1955). This interpretation of "bond," while more consonant with the theory being developed here, would violate its meaning for contemporary writers.

⁵⁹As we shall later see, power is measured along the power bases dimension of attribute space. It may be doubted that the resources for power, such as population, area, national income, and men under arms, capture "power" as meant by Organski and other international relations theorists. Organski, himself, however, defines power in terms of national income (see footnote 66). As Lasswell and Kaplan say (1950, p. 147). It "is power potential, rather than power position directly, which is crucial in the political process. The players do not always pay to see the winning hand." See also Lasswell and Kaplan (1950, p. 83).

The homogeneity hypothesis is that the more similar two nations are, the more likely they are to cooperate and enter into binding arrangements--the more integrative their behavior.⁶⁰ Russett (1967) has systematically investigated this hypothesis by computing Euclidean distances between nations in the space of four attribute space dimensions (similar to my economic development, political orientation, Catholic culture, and density dimensions)⁶¹ and analyzing the distances. The grouping of nations on these distances corresponded well with our intuitive regional grouping of nations⁶² and accounted, to a considerable extent, for groupings of nations on trade, UN voting, and organizational co-membership.

Russett also grouped nations on geographic distance and found some correspondence between such distance and the behavior groupings.

Building on Russett's work, and that of Jacob and Teune (1964) and Deutsch et al. (1957)⁶³ who argue the need for similarity in values for

⁶⁰"The most important analytical property for the study of the prerequisites of unification seems to be the degree of heterogeneity of the member units." (Etzioni, 1965, p. 19)

⁶¹This similarity is established in Puzmel (1969c) and Russett (1967).

⁶²One impressive grouping comprised the Soviet bloc, then within it Albania and China as a subgroup. (Russett, 1967, p. 55) It should be remembered that this was on attribute distances alone!

⁶³Quincy Wright says (1955, p. 542) of Deutsch that he "uses the terms political integration and amalgamation; psychological identification and assimilation; mutual responsiveness and simple pacification; and mutual interdependence and interaction to describe typical processes which if in proper relation to one another may develop a security community in an area. These appear to be similar, respectively, to the processes which I have described, from the point of view of increasing closeness of groups, as organization, standardization, co-operation, and communication ... , and, from the point of view of increasing separation of groups, as social and political, psychic and expectancy, legal and intellectual, and technological and strategic distances" Wright's comment is pertinent to my attempt here to explicitly subsume both Wright's theory and some of Russett's and Deutsch's hypotheses within a common frame and to tie them together using the concept of distance vector.

integrative behavior,⁶⁴ I will propose that cooperative (integrative) behavior of nations is a function of (1) the socio-cultural dimensions, which indexes a nation's values, (2) the political orientation dimension and economic development dimensions, and (3) geographic distance.⁶⁵ As a proposition for the U.S., it becomes the following.

Homogeneity Proposition: Distance vectors between the U.S. and an object nation on economic development, political orientation, and socio-cultural dimensions will contribute positively and geographic distance will contribute negatively to the cooperative behavior of the U.S. to the object nation.

The final hypothesis is the geographic one. It states simply that the farther away nations are, the less they interact either cooperatively or conflictfully. This hypothesis may be more salient for Burma, say, than the U.S. with its technological ability to span the globe and its "world

⁶⁴At the individual level, Williams (1947, p. 40) has pointed out that "there are often real intergroup differences in values, beliefs, personal habits, and customs. Such cultural differences may and often do lead to tangible disagreements on matter of considerable emotional importance to individuals; and both parties may be convinced of the rightness of their own positions." With regard to attitudes, Buchanan and Cantril (1953, p. 29, italics omitted) have noted that certain "nations are regarded with more friendliness than others, and that these nations have certain common cultural or historical characteristics." For a fascinating discussion of how differences in culture can affect views of time and space, see Hall (1959, 1969). Relevant to our discussion, Hall (1969, p. 2) states that "experience as it is perceived through one set of culturally patterned sensory screens is quite different from experience perceived through another."

⁶⁵Russett omitted the size dimension from his analysis, arguing that it is not a relevant criteria for cooperation leading to integration (Russett, 1967, p. 21). I will do likewise. The use of a number of dimensions to define homogeneity is consonant with Jacob's and Teune's argument (1964, p. 22), that homogeneity "should probably not be identified by any single index. The social boundaries of a community should be drawn on the basis of a composite profile of the various indicators previously mentioned." They also point out that the "feeling of social homogeneity" can be measured by the concept of "social distance." (1964, p. 19)

police man' policy. Yet, would Soviet missiles in 1962 have caused the same crisis were Cubas located in East Africa or South East Asia? It is difficult to accept that the same U.S. conflict and cooperation would be directed at a nation regardless of geographic distance. It is more likely that geographic distance acts as a moderator variable, dampening cooperation at a great distance or accentuating the conflict for close nations. This perspective is consistent with the following proposition.

Geographic Proposition: The geographic distance of the U.S. from the object nation contributes negatively to the cooperative and conflictful actions of the U.S. toward that nation.

Six aggregate level hypotheses about nation behavior have now been interrelated using the constructs of attribute and behavior space, dyad, and distance vector. Several propositions about the behavior of a particular set of dyads, all those involving the U.S. as actor, have been derived from these hypotheses. It may be helpful at this point to summarize the discussion by systematically placing the propositions in a table, with the proposed relationships (Table 1). As seen from the Table, there is a consistency in the proposed direction of relationships of distances to either cooperative or conflictful actions or their combination, as expected given the overlapping nature of the hypotheses, the consistency in the scholarly literature, and the common framework (e.g., distance vectors) within which the hypotheses were interpreted. The important thing, however, is not this consistency, but whether the common thread --the theoretical proposition that distance vectors explain nation behavior --and equation (1) giving specificity to this relationship are consistent with observation. For an answer, we must leave our armchair and easy talk

TABLE I
Propositions About U.S. Aggregate Behavior

Proposition	Behavior	Attribute Space Dimensions				
		Econ. Dev. Dist.	Power Bases Dist.	Pol. Orient. Dist.	Geographic Dist.	Socio-Cultural Dist.
Linkage	all	+	+	+		
Status A	cooperative	-	-			
Status B	conflictful	+	-			
Status C	coop. + conflict		-			
Distance ^{/a}	coop. - conflict	-		-	+	-
Power	coop. - conflict		+			
Homogeneity	cooperative	-		-	-	-
Geographic	coop. or conflict				-	

^{/a}The signs on this relationship have all been reversed from Equation (7) to conform with the direction of the other relationships expressed in the Table.

and confront the aggregate phenomenon. For if 'we shrink from conflict with reality, why invite it by making assertions' (Popper, 1965a, p. 273).

Space and prudence do not permit a thorough discussion of the methods used in testing the above propositions--since this has been done elsewhere (Rummel, 1969b). Suffice it to say that treating behavior and attributes within a linear space enables the product moment coefficient, and the multiple regression, component factor analysis, and canonical analysis models to be part of the theoretical structure of field theory. They then become the techniques for operationalizing and testing derivations of the theory of propositions imbedded in the theory.

In a previous study (Rummel, 1969b) the location of thirteen dyads involving the U.S. as actor (objects were Brazil, Burma, China, Cuba, Egypt, India, Indonesia, Israel, Jordan, Netherlands, Poland, U.S.S.R., and U.K.) in 1955 behavior space was related (using canonical analysis) to 1955 distances (differences) between the U.S. and the thirteen object nations. The distances were on economic development (indexed by energy consumption per capita), power bases (indexed by national income⁶⁶), freedom of group opposition, and geographic distance. Because of the small number of cases (13), not all dimensions of behavior or attribute spaces could be used.

⁶⁶With regard to the previous discussion of the power hypothesis, Organski (1960) recommends national income as the best measure of power. The reason national income was selected here was primarily because of its very high correlation with the power bases dimension (Rummel, 1969c) for all nations and secondarily because of Organski's suggestion and use of the indicator.

Quincy Wright (1955) recommends energy production times population as an indicator of the power of a nation. This indicator, however, is also very highly correlated with national income and with the power bases dimension (Rummel, 1969c). Therefore, national income is tapping almost the same variances that would be included were I to use Wright's indicator (or, for that matter, defense expenditures, men under arms, GNP, population, or energy production).

Attribute space therefore was defined in terms of the dimensions mentioned: economic development, power bases (size), and political orientation. Geographic distance was also included.

The behavior space dimensions were summed into three statistically independent (orthogonal) dimensions of conflict behavior, administrative behavior, and private international relations.⁶⁷ For this sample on these three dimensions, fifty-five percent of the variation in overall U.S. actions were accounted for by the distances. Specifically, ninety percent of the variation in U.S. conflict behavior toward the thirteen nations was accounted for by power and political orientation distance vectors. The function is

$$.87CF \doteq -.65PB + .57PO, \quad (9)$$

where CF denotes conflict behavior, PB denotes power bases distance, PO distance on political orientation, and \doteq means approximately. The coefficients are for standardized data. With regard to U.S. private international relations (tourists, students, exports, immigrants, etc.), seventy percent of the variation in this behavior is accounted for by economic development

$$.99CO \doteq -.65ED, \quad (10)$$

⁶⁷ There were originally eleven behavior space dimensions for 182 dyads. "By studying the content of the eleven dimensions, three kinds of substantive classifications emerge: dimensions manifesting private international relations, those comprising administrative behavior, and those involving conflict behavior." (Rummel, 1969b, p. 34) Private international relations consist of salience (e.g. translations, tourists, treaties), communications, exports, students, and migrants dimensions; administrative behavior consist of diplomatic and international organization dimensions; conflict behavior consist of U.N. voting, self-determination voting, negative sanctions, and deterrence dimensions. See Rummel (1969b, Table 1) for the behavior variables related to these dimensions.

where CO denotes cooperation (since private international relations encompass a cooperative range of actions) and ED denotes economic development.

Both equations (9) and (10) express empirical relations that overlap with the propositions of Table 1. Equation (9) relates to the status B proposition, but while power bases is included and in the right direction, economic development is not. In its place is political orientation distance. Equation (10) is similar to the status A proposition, except that while economic development is in the hypothesized direction, the power bases dimension is not included.

Overall, attribute distances accounted for fifty-five percent of the variance in the behavior of the U.S. toward the thirteen object nations. This is consistent with the theoretical proposition that behavior is linearly dependent on distance vectors.

The difficulty with generalizing the above results is the small sample, however. Accordingly, data have been collected for the behavior of the U.S. toward 81 other nations in 1955 and the results of analyzing these data will be reported here.

The choice of dyadic variables on which to collect U.S. behavior data was guided by the results of the analysis of fifty variables for 182 dyads (including the above-mentioned dyads with U.S. as actor) for 1955. Variables were included to index the behavior space dimensions⁶⁸ for the 182 dyads to be as diverse as possible so as to capture a wide range of

⁶⁸These dimensions are shown in Rummel (1969b, Table 1). The difference between this set of dimensions for 1955 and those shown in Rummel (1969c) is that the latter are computed across missing data while the former are computed on a matrix with missing data filled in by regression estimates.

variation in U.S. foreign behavior, to exploit the greater availability of data in the U.S. for some variables (such as foreign investments), and to take account of the type of analysis to be done. On the last criterion, there was no reason to include, say, export US→j/total U.S. trade, since the denominator will be constant for all U.S. dyads, and accordingly the variable will have a perfect correlation with exports US→j alone. Thus, no variable normed by U.S. totals is included in the analysis. The list of variables for which data were collected is shown in Table 2.

Attribute space for 1955 has already been analyzed for all nations (Rummel, 1968) and all that is needed here is that distance vectors between the U.S. and object nations be computed on the dimensions of this space. Table 2 gives the attribute space dimension and the indicator of that dimension on which distance vectors between the U.S. and object were computed.

The results to be presented are divided into three parts. First, the patterns among the dyadic behavior of the U.S. will be considered. Second, the findings relevant to the fundamental field theory proposition will be weighed. And finally, the results bearing on the six propositions discussed above will be measured.

The nineteen actions of the U.S. toward 81 nations in 1955 range from tourists, through exports and treaties, to conflict behavior.⁶⁹ How are these actions patterned? This is an interesting and important question in itself, but unfortunately, one on which we cannot dwell with great detail here. Nonetheless, in order to make the U.S. behavior suitable for subsequent canonical analysis, a preliminary factor analysis was necessary to reduce U.S.

⁶⁹Before analyses of the data could be done, missing data had to be estimated using a regression estimation technique described elsewhere (Wall and Rummel, 1969).

TABLE 2
U.S. Behavior Space

Variable No.	Variable Code	Variable	Missing Data
1	BOOKS	exports of books and periodicals US→j	0
2	TOURIS	tourists US→j	17
3	TREATY	treaties US→j	0
4	EXPORTS	exports US→j	0
5	STUDNT	students US→j	24
6	EMIGRA	emigrants US→j	11
7	EMBLEG	embassy or legation US→j = 1; none = 0	0
8	IGO	intergovernmental organizations of which US and j are comembers	0
9	D-UN	agreement US-j on major 1955 dimensions of UN voting	18
10	NEGSAN	negative sanctions factor scores, US→j	0
11	MILVIO	military violence factor scores, US→j	0
12	NEGCOM	negative communication factor scores, US→j	0
13	ECO Aid	economic aid, US→j	0
14	INVEST	private investment, US→j	8
15	MIL AID	military aid, US→j	0
16	COMMIT	military committment, US→j	0
17	VISITS	official visits, US→j	0
18	MILPER	military personnel stationed in, US→j	0
19	CONFER	conferences, US→j	0

dyadic behavior to their independent patterns (or dimensions, as they are more technically known).⁷⁰

The factor analysis results are given in Appendix II and the values of U.S. dyads (factor scores) on these patterns are listed in Appendix III.

The nineteen U.S. dyadic actions were found to cluster into six distinct and independent patterns. The first pattern⁷¹ comprises the movement of American students and emigrants to other nations, treaties with those nations, military aid to them and high level conferences involving them. At first, this appears to be a cooperation dimension, but if so, how does one explain that these kinds of actions are independent of exports, tourists, economic aid, etc.? A look at the values of U.S. dyads on this pattern, as given in Appendix III, shows that the object nations highest on this pattern are Belgium, France, West Germany, Italy, Netherlands, Switzerland, and the United Kingdom. Lowest are Burma, Cambodia, El Salvador, Guatemala, Laos, and South Vietnam. Obviously, this pattern is a cluster of U.S. actions peculiarly directed to Western European nations and will be named Western European Cooperation.⁷²

⁷⁰My preference is to do a canonical analysis on the raw data. The relationship among the two sets of variables is given directly, then. However, because the correlation matrix of U.S. behavior was virtually singular (determinant = 5.0×10^{-5}), the data had to be first reduced to a set of independent dimensions.

The scientist using conventional canonical analysis must watch the determinants of the correlation matrices being computed in the analysis (and unfortunately, few programs evaluate these determinants). For, if the determinant is very small, say 1.0×10^{-5} , then the matrix is virtually singular and the values of the inverse of the matrix will hinge largely on random error. Canonical analysis results will be there in this event, but they probably will be distorted and misleading.

⁷¹From this point on, I will be interpreting the rotated dimensions in the order they are shown in Appendix II.

⁷²That such a pattern should emerge should surprise no one. First, it is worthwhile to remember as we see the other patterns how well the analysis

A second cluster of U.S. actions, independent of and larger than the above, also is cooperative in nature. This consists of U.S. exports of books, exports in general, U.S. tourists, U.S. private investments, and U.S. emigrants. Only two nations are the major recipients of this behavior: Canada and the U.K. Perhaps most would agree in calling this an Anglo-American Cooperation pattern. It is interesting to note that the nations with the lowest values on this dimension are Venezuela and Mexico. This disparity in behavior to Canada and Mexico, especially, since both are large nations contiguous to the U.S., underscores the effects that socio-economic and cultural differences can have in foreign behavior. But we will examine this more precisely later.

The Western European and Anglo-American patterns were cooperative. The third pattern delineated is of conflict. Specifically, a cluster of military violence and negative communications actions,⁷³ and only these actions, are involved in this pattern. The U.S., as a major world power with global political interests and concerns, employs both negative communications, military warnings and violence as ways of communicating its national interests and expectations--as ways of drawing the lines other nations cross at their own risk. Consonant with this point, Appendix III shows that the two major objects of this behavior are the U.S.S.R. and China. This pattern

⁷²(continued)

uncovered some patterns that are "common knowledge" among scholars, when my subsequent results are not so obvious or immediately understandable. Second, even though the existence of a Western European Cooperation pattern is known, the precise behavior defining it and the values of nations on it are not known. This additional knowledge--a precise comparative measurement of the pattern--is provided by this analysis at the aggregate level.

⁷³As can be seen from Appendix I which defines the military violence and negative communication variables, these variables themselves measure separate clusters of conflict actions found in conflict data for 340 dyads. Consequently, more is involved in the cluster than two variables; rather a whole spectrum of military activities and negative communications is defined by this pattern.

of behavior clearly resembles deterrent behavior and I will call it a Deterrence pattern.

Deterrence is independent of the other cooperative dimensions, meaning that sometimes the U.S. directs deterrent behavior at its Western European and Anglo-American friends, and sometimes the U.S. is cooperative with the major objects of U.S. deterrent behavior. This independence⁷⁴ of conflict and cooperative type behavior has been consistently found in a number of studies. The foreign conflict behavior of 82 nations in 1955 was found independent of other kinds of foreign behavior (Rummel, 1966). For about 340 dyads in 1955 conflict behavior was found independent of other kinds of dyadic behavior (Rummel, 1969b), and in 1963 the same independence was found for the same number of dyads (Rummel, 1970b). The evidence for the belief that conflict and cooperation are not antipodes--opposite ends of a continuum--but are statistically independent dimensions of international relations is mounting.⁷⁵

The fourth cluster of U.S. dyadic actions is diplomatic, administrative, and military in nature. These comprise the existence of a U.S. embassy or legation in the other nation, common intergovernmental organization memberships, U.N. voting agreement, and military defense commitments. Among nations high on this pattern are Australia, Belgium, Taiwan, Thailand, Union

⁷⁴On independence, see footnote 81.

⁷⁵A theoretical rationale for this is provided by Deutsch (1966), who argues that cooperation and conflict are both the consequence of high interaction. Whether the relationship goes in one direction or the other depends on the "covariance of rewards or interests."

of South Africa, and most Central and South American Countries; lowest are Albania, Bulgaria, China, East Germany, North Korea, Outer Mongolia, and North Vietnam. This is a purely Cold War pattern⁷⁶ (remember, this is 1955 behavior).

The fact that Anglo-American and Western European nations do not have high scores on this dimension (and the U.S.S.R. a low one) implies that although there are cold war elements in U.S. behavior to these nations, there are also other ingredients as well, as we well know.⁷⁷ The finding of a cluster of conflict actions called Deterrence apart from Cold War behavior is also understandable. The U.S. must constantly communicate intent to friend, foe, and neutrals alike. Military alerts, warnings, threats, and diplomatic protests are devices for signaling Egypt, France, Peru, Panama, and Israel, as well as obvious U.S. enemies, and they are so used. Thus, the Cold War pattern is a delineation of those actions and a denoting of those nations with which U.S. behavior uniquely defines the Cold War.

The fifth pattern of U.S. behavior consists mainly of negative sanctions and, to a lesser extent, the stationing of U.S. military personnel in the country. In 1955, the U.S. directed some negative actions toward West Germany and Japan (as well as Burma, China, and Czechoslovakia). West Germany had, then, the largest contingent of American military personnel abroad, and Japan ran a close third to South Korea in U.S. troops stationed

⁷⁶This pattern conforms with the findings of Teune and Synnestredt (1965). Using bivariate statistics on 119 nations and alignment data on 70 variables for 1953 and 1963, they found that the best objective measures of US-USSR alignment (as judged by comparison with expert ratings) are military commitments, U.N. votes, diplomatic recognition, and official visits. These four variables (official visits has a loading of $-.48$ in the Cold War pattern), in addition to international organizations, define our Cold War pattern for the U.S.

⁷⁷One of the best social science studies of these ingredients is that for the US-UK dyad by Russett (1963).

in the country. Thus, the relationship between negative sanctions and U.S. military personnel follows. This pattern will be called Negative Sanctions.

Finally, the sixth cluster of actions almost wholly involves economic aid. To a much lesser extent, military aid is also a part of the pattern. Aid is therefore a specific kind of U.S. behavior, apparently independent of uniquely Cold War actions (which would be true if aid is given for a combination of reasons, including political and altruistic)⁷⁸ as well as other kinds of cooperative activity. This will be called an Aid pattern.⁷⁹

These six patterns of U.S. dyadic behavior--Western European, Anglo-American, Deterrence, Cold War, Negative Sanctions, and Aid--should, if field theory is correct, be dependent on the attribute distances of other nations from the U.S.⁸⁰ As listed in Table 3, below, thirteen indicators

⁷⁸Independence means that there is no statistical relationship. With regard to aid, this would obtain if aid were given sometimes for cold war reasons, sometimes for altruistic purposes. A positive relationship with the Western European pattern (as happens with military aid) and a negative relationship with the cold war pattern would occur for economic aid if it were given for wholly political reasons: a positive relationship would probably occur with cold war behavior if it were never given for political reasons but altruistically. Consider the countries in need: China, Albania, Bulgaria, Outer Mongolia, among others, certainly would be recipients on humanitarian grounds alone.

⁷⁷Aid was also independent of other foreign behavior for 32 nations in the analysis mentioned in footnote 1, and in a just completed analysis of the behavior of 182 dyads with 1963 data (Rummel, 1970b).

⁸⁰These six patterns that have been formed in U.S. actions could be considered as operationalizing Rosenau's 'issue area' concept. For Rosenau, an issue area comprises a distinct "interaction pattern" and mobilizes different interests (1966, p. 71) within a nation. Each of the six patterns, whether Aid, Deterrence, or Anglo-American, does involve different interest groups within the U.S. and, as I have shown, does involve distinct U.S. behavior. If this point is granted, then in effect this whole paper could be considered a definition of U.S. issue areas and a linking of these to "the variables defining the external behavior" of the U.S. within Rosenau's framework.

The possibility that Rosenau's "pre-theory" could be rigorously developed within a field theory context, such as that being developed here, has been

TABLE 3

<u>Dimension</u>	<u>Indicator</u>
1. Economic Development	energy consumption per capita
2. Power Bases	national income
3. Political Orientation	freedom of group opposition ^{a/}
4. Foreign Conflict Behavior	number of threats
5. Density	population/national land area
6. Catholic Culture	Roman Catholics/population
7. Domestic Conflict	number domestic killed
8. Oriental Culture	number of religious groups
9. (unnamed)	foreign college students/college students
10. Traders	exports/GNP
11. Equality	government education expenditure/ government expenditures
12. Diversity	number of language groups
13. Sufficiency	proteins/calories

^{a/} Measured as: 0 = political opposition not permitted;
1 = restricted opposition permitted, but cannot campaign
for control of government;
2 = unrestricted.

of the dimensions of attribute space can be used to determine these distance vectors.

Appendix IV contains the canonical analysis of U.S. dyadic behavior and attribute distances. The results show how well the variation of U.S. dyadic behavior on the six independent patterns can be explained by the attribute distances vectors plus geographic distance. At the moment, our interest is in the overall relationship between U.S. behavior and U.S. attribute distances, for this would be high if results accord with the field theory axiom that distance vectors are forces determining behavior.

Specifically, we are concerned with how dependent behavior space is on attribute space. When we ask about the relationship between spaces, we are being severe in our test (as we should be), for we are asking how dependent all the infinite linear combinations of the six behavior patterns are on all

80 (continued)

pointed out by others. At a 1966 conference on the Interdependencies of National and International Political Systems reported in Rosenau (1967), one speaker (only identified as "First Speaker") said that: "When I think of a field that might present some analogies, some models for emulation, for studying national-international linkages, the field that comes most prominently to mind is psychology, particularly certain schools of psychology. Among the schools of psychology, the one that seems to provide the most fruitful grounds for emulation is, of course, field theory. It is a natural area of psychology in which to look for analogies because it is specifically concerned with the linkages between the personality and its various environments or fields. Field theory is not concerned with personality *per se*--the needs, drives, and reflexes of human beings. It is not concerned with particular external objects or stimuli acting upon the personality. It is concerned with the characteristics of social fields in which and on which individuals operate" (Rosenau, 1967, p. 31). The same speaker also pointed out later: "Another typological problem that has cropped up again and again in our discussions was also confronted by the field theories in psychology. It is the problem of how one constructs a differential spatial geometry for the various fields in which the unit acts and which act upon the unit. The (Rosenau) linkage paper we have discussed tackles the problem as one always does at the outset, in an offhand way. It breaks down the international environment of a national system by distinguishing among their contiguous environment, the regional environment, the cold-war environment, and so on. Some of the field theorists in psychology have tackled the problem in an extremely rigorous way" (Rosenau, 1967, p. 32).

the infinite linear combinations of attribute distances.⁸¹ The result is that the (trace) correlation between the two spaces is .68, which means that almost fifty percent of the variation of U.S. dyads in behavior space can be explained by distance vectors.

This result is well within the ball park. Considering that social scientists point with pride to correlations of .4 and .5, and that the behavior being explained ranges from private international relations to public, and from cooperative to conflictful. And considering that such behavior to all nations is being explained, whether Yemen, Cuba, Haiti, U.K., France, or China and the U.S.S.R., then to account for almost fifty percent of the behavior on the six U.S. dyadic patterns or their linear combinations is positive evidence for the theory.

Our final concern is with the six propositions-- the linkage, status, distance, power, homogeneity, and geographic propositions--tied together within field theory by the distance vector construct. How do the canonical results in Appendix IV bear on these propositions?

Our first relevant finding is that U.S. Western European behavior and Deterrence are explained by power parity, to the amount of eighty-eight percent of the variance (.94 correlation). The equation for this is

⁸¹This mathematical concept of "all possible linear combinations" may need clarification. Consider three variables, such as X_1 , X_2 , and X_3 . A linear combination would be $X_1 + 3X_2$. Another would be $X_1 + X_2 + X_3$. A third would be $5X_2 - 16X_3$. In general, any combination Y where $Y = aX_1 + bX_2 + cX_3$ and a , b , c are any real numbers, is a linear combination. In effect, Y is a scale derived from the three variables and an infinitude of such scales can be formed linearly from any set of variables. All these scales, including each variable itself, constitute a space in mathematical terms. Now, to consider the behavior space of the U.S. is to consider the infinitude of behavior scales that could be linearly formed from the six patterns.

$$.81 (WE) + .66(DE) \pm -.81(PO),$$

where WE means Western European behavior, DE stands for the deterrence pattern, and PO is the power distance vector as before.⁸²

This is strong confirmation for status proposition C, which was derived from the theories that equal status leads to high cooperation and status disequilibrium causes conflict. This finding confirms both status notions and suggests how power alone can explain U.S. behavior; economic development as a status cancels out through having opposite effects.⁸³

The above equation provides a set of estimates of behavior, the combination of WE and DE, from power distance (difference). Figure 4 plots the estimates of this behavior combination from power parity. The dyads fairly well align themselves along the perfect prediction line, as to be expected from a correlation of .94. As shown, U.S. actions to France on this joint behavior (Western European plus deterrence) could be almost perfectly predicted from power distance, while U.S. to India is poorly predicted, U.S. behavior to India is relatively undercooperative or deterrent, given Indian power relative to the U.S. This may be explained by a Western-oriented perception of the U.S. which tends to underate non-European nations. Consider that those to whom the U.S. underbehaves in the Figure are Egypt, Japan, India and China, (excluding the U.K., which is a special case and which the U.S. much takes for granted), while those to whom

⁸²The scores for WE, DE, and PO are assumed standardized and this assumption will hold for all subsequent relationships to be discussed.

⁸³Since many papers of this type are written after the results are in, I should remark that this one was written (up to the discussions of the results) before completion of the computer analyses. Thus, in the true sense of the word, these results confirm an *a priori* hypothesis.

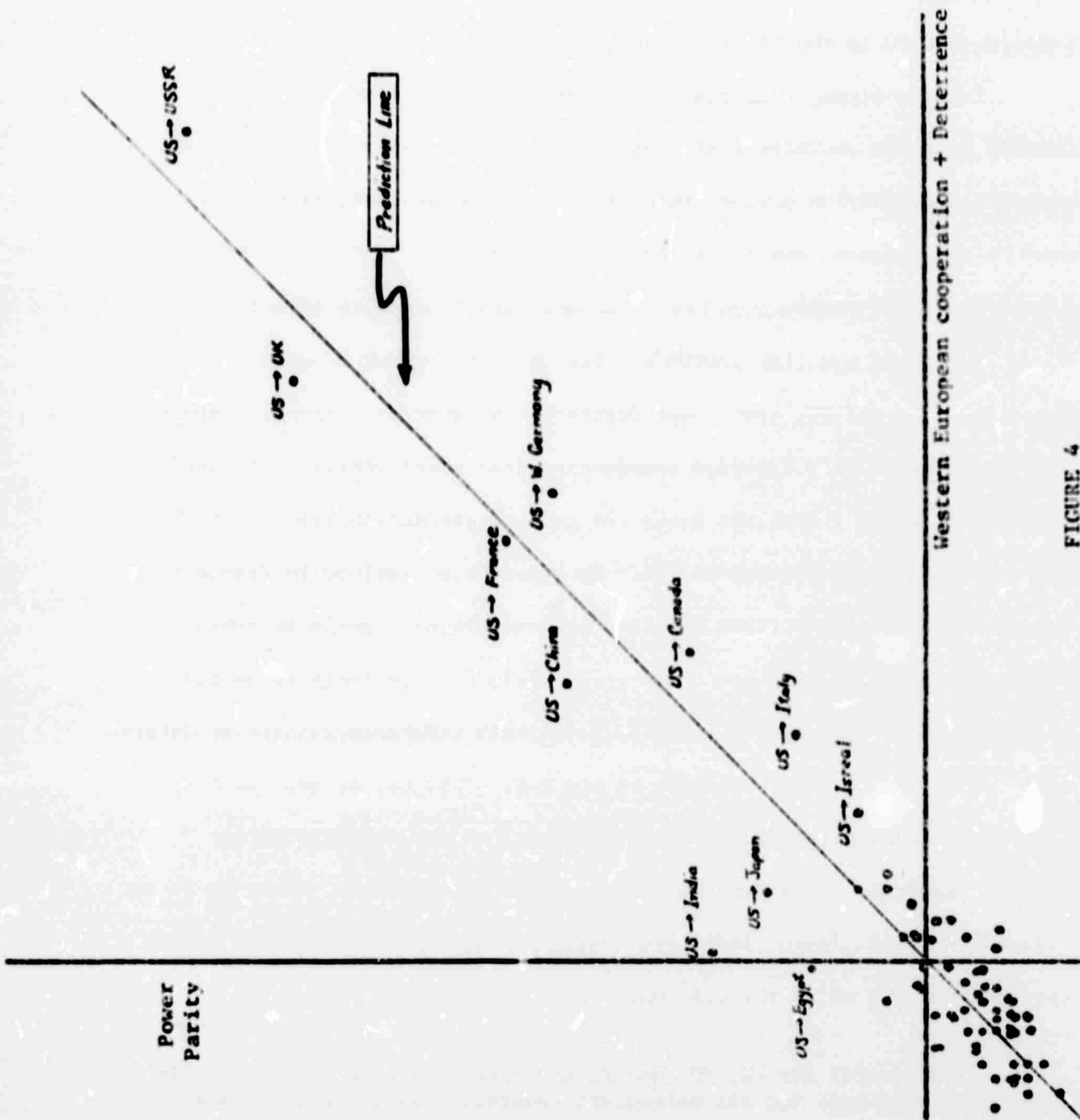


FIGURE 4

the U.S. overbehaves are U.S.S.R., West Germany, Canada, Italy and Israel (perceived in many ways as really a European style nation). This suggests that a future test include an attribute that measures the Europeaness of a nation. Distance from the U.S. on this attribute should then account for those deviations from prediction of power distance.

The second relevant finding is that sixty-eight percent of the variation in U.S. dyadic behavior on the Cold War pattern is explained by distance (difference) in political orientation and Catholic culture. The equation is

$$.79(CW) = .56(PS) + .48(CC),$$

where CW is the cold war pattern, PS is political distance, and CC is Catholic culture.⁸⁴ The equation says that Cold War behavior increases, the more politically distant the object nation is and the less is the Catholic culture.⁸⁵

The plot of the behavior predictions from these two attribute distance vectors is shown in Figure 5. Given their distances from the U.S., we overact toward Venezuela, Ireland, Outer Mongolia, China, and the U.S.S.R. on the Cold War pattern and underact toward the U.K.

The finding expressed by the equation indicates that Power Bases is irrelevant for explaining U.S. cold war behavior (when such behavior is understood to consist of those behaviors found to cluster together into the pattern I am calling Cold War). Rather, such behavior is mainly a function of

⁸⁴The coefficients for the second canonical variates have all been reversed in sign for simplicity.

⁸⁵The U.S. is near the mean in Catholic culture. Thus, when differences are taken, some U.S. dyads will be high positive, some high negative. Those at the high positive end will be those that are lowest on Catholic Culture; those that are high negative will be highest on Catholic culture. Thus, the positive coefficient on CC is to be read as indicating that Cold War behavior increases the more non-Catholic the object. If CC were a distance magnitude, then the coefficient would simply mean that the more unlike the U.S. in CC, the more Cold War behavior.

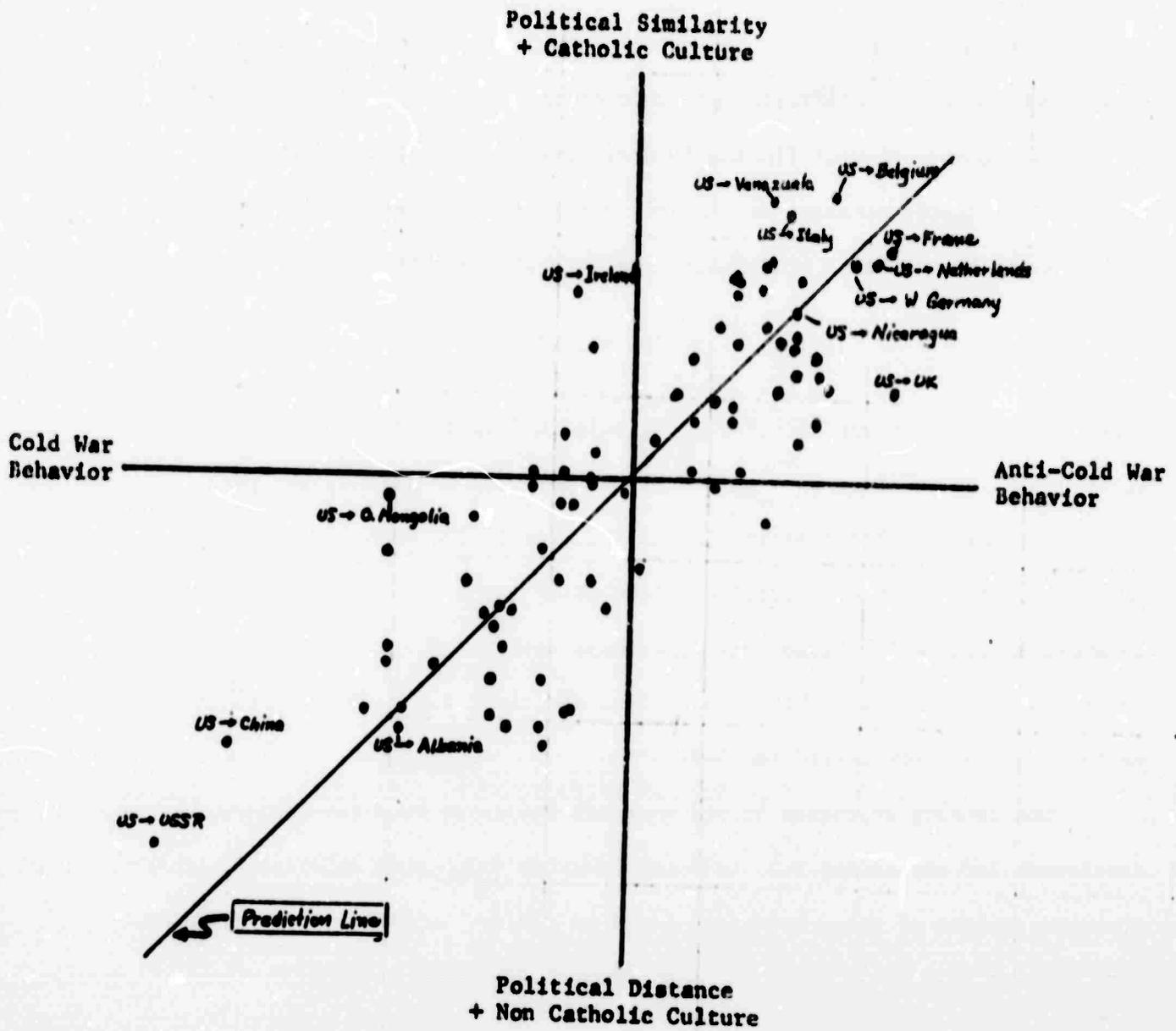


FIGURE 5

political and religious distance--that is, ideology. The previous finding in conjunction with this one means that there are two overlapping spheres of U.S. action. Nations in one sphere consist of those which have relative power parity with the U.S. and toward which the U.S. directs Western European behavior or deterrence. In the other sphere are those which are far from the U.S. in political system and non-Catholic; to them we direct Cold War behavior. The U.S.S.R. and China are in both spheres, which means that both power parity and ideological distance are forces influencing U.S. behavior toward these two nations.⁸⁶

The Cold War pattern is almost a cooperative-conflict continuum, except at the Cold War end there is not conflict behavior, necessarily,⁸⁷ but rather a lack of behavior. Nations high on this pattern are being systematically ignored--a conflict situation exists between them and the U.S. At the other end of the continuum are a number of cooperative actions, such as U.N. voting agreement and military commitments. If this end of the Cold War continuum, or pattern, is taken as a type of cooperation, then how does the above finding relate to the six propositions of concern to us? The finding that about two-thirds of the variation in Cold War behavior can be accounted for by political and Catholic Culture distances partially confirms the homogeneity proposition. This proposition asserted that the more similar in economic development, political system, socio-cultural distance, and closer geographically, the more cooperative (or integrative) the two nations. We find that only political and

⁸⁶This may seem trite, something that is obvious from any educated reading of the New York Times. However, the reader must bear in mind that these are results of the analysis of U.S. behavior data and distances, and that anyone doing the analysis without ever having read a newspaper or a book on international relations would come to this "educated" conclusion. He would undoubtedly name the patterns differently and talk more in terms of coefficients and correlations. But, he would find the same relationship and make the same predictions.

⁸⁷Note that conflict behavior is uncorrelated with this dimension.

socio-cultural distances are salient, but that economic and geographic distances are not. We will return to this point after some other results are considered.

The third relevant finding is that fifty-three percent of the variation in the volume of Western European behavior over deterrent behavior is explained by geographic distance and difference in density. That is, the U.S. is more inclined to de-emphasize Western European behavior and de-emphasize deterrence if the other nation is far and densely populated; if close geographically and sparsely populated, then deterrence is emphasized over Western European behavior.⁸⁸ The equation is

$$.54WE - .52DE = -.60DS + .61GD,$$

where DS is density⁸⁹ and GD geographic distance. The subtraction of deterrence from Western European behavior produces a scale, with U.S. object nations receiving high European behavior from the U.S. and no deterrence at one end and nations receiving high deterrent behavior and no Western European behavior at the other. Considering that the density dimension of attribute space has not been found to involve much more than the number of people per square mile and railroad and road lengths (Russett, 1967; Rummel, forthcoming) why density should be relevant to this behavior is not clear.

The fourth finding is that about one-third of the variation in U.S. Anglo-American behavior can be accounted for by similarity in economic development, dissimilarity in foreign conflict behavior, the Catholic nature of the object, and geographic closeness. The equation is⁹⁰

⁸⁸This is not a clean relationship between the variables mentioned, for from the canonical coefficients for the third variate we can see that Anglo-American, Cold War behavior, and Economic Aid enter in to a smaller degree, as do some of the attribute distances.

⁸⁹The high values on DS are nations of low density.

⁹⁰All signs on the coefficients for the fourth canonical variates have been reversed.

$$.82AA = -.75ED + .80FC + .64CC - .46GD,$$

where ED is economic development, FC is foreign conflict, and AA is Anglo-American behavior.⁹¹

The final relationship found in the canonical analysis is that almost one-third of the variation in aid given by the U.S. can be explained by similarity in political system and the degree of oriental culture.⁹² The equation is⁹³

$$.78(AID) = -.53(PS) - .84(OC),$$

where OC means oriental culture. If a country has religious diversity and many nationalities, a relatively high proportion of Buddhist and orientals, and has had former membership in the British Commonwealth,⁹⁴ then they are most likely to receive U.S. aid.

Five separate findings have been presented. Before these are pulled together with regard to the six propositions, the overall findings should be considered for the moment wholly in terms of the importance of economic development, power bases, and political orientation.

⁹¹According to Strausz-Iupé and Posony (1950, p. 238), "Anglo-American friendship or cooperation is partly based on language, partly on identity of interests as determined by the geographical constellation. Yet these bonds are immeasurably strengthened by the associative elements of cultural and political structure and by the pull of common political ideals--particularly if and when these ideals meet the opposition of other powers." The above results suggest that we subtract out the "political structure" and insert "economic development distance" as one of the bases of Anglo-American friendship.

⁹²Oriental Culture is indexed by the number of religious groups.

⁹³All signs are reversed for the coefficients of the fifth canonical variates.

⁹⁴These attributes were those found to be part of the Oriental Culture dimension (Rummel, forthcoming).

From the results in Appendix IV⁹⁵ it can be seen that economic development, power bases, and political orientation (as indexed by energy consumption per capita, national income, and freedom of group opposition) have good ability to explain behavior. Economic development distance alone explains 7.5 percent of the variation⁹⁶ in U.S. dyads in behavior space; the percentages for power bases and political orientation distances are 13.9 and 5.8 respectively. The average variance accounted for by all the remaining distances is 3.7. These three distances together have a higher ability to explain behavior than any three other distances among those involved in the analysis. The probability of this occurring by chance if each of the fourteen dimensions has equal possibility to affect behavior is .0031, or odds of about 322 to 1.⁹⁷ This is strong evidence for the linkage proposition based on Rosenau's "pre-theory."

All the above results can now be organized into a table comparing them with the propositions, as shown in Table 4. First, the table shows that the field theory proposition is substantiated, as previously discussed. Second, the linkage proposition of Rosenau is shown to have much empirical value when interpreted in terms of distance.

Third, the status A and B propositions are not supported. For status A proposition, the actual results for economic development distance are in

⁹⁵The results of interest are in the communality column of the structure matrix.

⁹⁶This variance and the following ones are the same as the trace correlation squared, but in this case it gives the variance in behavior space explained by the single distance. The variance is derived by summing the squared correlations (not shown in the Appendix) of the distance with the six patterns and dividing by six. This interpretation is possible because the patterns are orthogonal (slightly correlated basic indicators were used to generate the distance vectors), these variance figures would all sum to the squared trace.

⁹⁷This is taking into account that three distances outside of economic development and size have a better ability to account for U.S. behavior than political orientation, and that one distance (Catholic Culture) accounts for

TABLE 4

Actual and Predicted U.S. Behavior

Propositions	U.S. Dyadic Behavior ^{a/}		Attribute Space Dimensions					
			Variance Explained %	Econ. Dev. Dist.	Power Bases Dist.	Pol. Orient. Dist.	Geog. Dist.	Socio-Cultural Dist. ^{e/}
Field Theory	Predicted Actual	Behavior Space	100.0 47.0					
Linkage	Predicted Actual	Behavior Patterns	27.2 ^{c/}	[±] 7.5 ^{b/}	[±] 13.9 ^{b/}	[±] 5.8 ^{b/}		
Status A Similarity	Predicted	Cooperation		-	-			*
	Predicted	Cooperation		-			-	*
	Actual	Anglo-American Cooperation	33.8	-			-	*
	Actual	Aid	31.8				-	*
Status B	Predicted Actual	Conflict Cold War	67.7	+	-		+	*
Status C	Predicted Actual	Cooperation + Conflict W. European + Deterrence	88.0			-		
						-		
Distance Power	Predicted	Cooperation		-			+	*
	Predicted	- Conflict						
	Actual	Cooperation - Conflict W. European - Deterrence	52.9		+			
							+	*
Geographic	Predicted Actual	Cooperation or Conflict Behavior Patterns	6.0 ^{b/}					6.0 ^{b/}

^{a/}Actual results are derived from the canonical analysis in Appendix IV.

^{b/}This percentage is the amount of variance in behavior space explained by the distance. See footnote 96 for discussion.

^{c/}This is the total variance in behavior space explained by the three distances. See footnote 96 in text for discussion.

^{d/}This is the total variance in behavior patterns explained by geographic distance. See footnote 96 in text for discussion.

^{e/}Since we are dealing with distance vectors, the direction of the socio-cultural distances were not predicted. All that was predicted was a relationship to behavior for at least one of these vectors, which is indicated by an asterisk. The finding of such a relationship is also shown by an asterisk.

the wrong direction and power bases does not contribute much explanation to behavior. For the status B proposition (the disequilibrium one), the relationship is between dimensions other than those predicted.⁹⁸ These findings for status A and B propositions do not necessarily falsify status theory, however, since it was shown (Equation 4) that status A and B propositions in conjunction cause economic development distance to drop out (the U.S. is cross-pressured on this dimension) and leaves power, the status C proposition. This proposition, as mentioned and shown in Table 4, is strongly verified.

The evidence for the similarity proposition comes out slightly mixed, but on balance very favorably. Two kinds of cooperative type behavior are found related alone to the distances. One is Anglo-American Cooperation, which is most dependent on economic similarity, geographic closeness, and similarity in Catholic Culture. The second behavior is Aid, which is most dependent on similarity in political system and dissimilarity in oriental culture. Were we to define cooperation in terms of a sum of Aid and Anglo-American Cooperation, then the proper distances would be in the predicted direction, with the exception of Oriental Culture. This also holds true if we consider cooperation the opposite of Cold War (classified in the Table for the status C proposition). Then, we would find that the anti Cold War behavior of the U.S. is predicted by political similarity and Catholic culture.

97(continued)

more variance than economic development. This means that there are six permutations of the fourteen distances, taken three at a time, that would have an average ability to account for U.S. behavior at a level greater than the three distances. When these three distances are counted in as a permutation, then the formula for the probability is $7/14 \times 13 \times 12$.

⁹⁸Note that the status B proposition is the only one defining conflict behavior alone. Our results on this tend to be in line with Russett (1967, p. 199), who after relating U.N. voting patterns, proximity, economic interdependence, common institutional membership, and socio-cultural similarity to occurrence of war between nations, concluded that "we can rule out the possibility that similarity, by itself, is a cause of war."

The distance (from Wright) and power propositions do not seem applicable. The only part which holds up is that geographic and socio-cultural distances help to explain cooperation minus conflict, when such comprises Western European cooperation⁹⁹ minus deterrence.

Finally, the geographic proposition does have some validity. Of the fourteen distances, nine have less effect on behavior than geography and geographic distance explains more variance in U.S. dyadic behavior than political distance. Consequently, although the total contribution of geography in accounting for U.S. behavior is small (five percent), relatively geography plays a role in U.S. behavior.¹⁰⁰

In summary, field theory has been found to explain a considerable portion of U.S. dyadic behavior.¹⁰¹ When status theory is subsumed by field theory and status differences are interpreted as vector distances,

⁹⁹For Wright's proposition, even the wrong kind of cooperation is involved here. Given his emphasis on technological distance being defined by communication and transactions as measured by trade, the Anglo-American pattern is more appropriate since exports load most highly on it.

¹⁰⁰This is in contrast to Russett's finding that the ability of propinquity to predict the clusterings of nations on UN voting, trade, socio-economic characteristics, and international organizations co-membership "is rather illusory." (Russett, 1967, p. 213)

¹⁰¹For contrast, the canonical analysis was rerun using distance magnitudes instead of vectors. This would be more consonant with the concept of distance employed by Wright and Russett. The trace correlation for magnitudes is .63, as contrasted with .68 for vectors, the first two canonical correlations for magnitudes are .94 and .80, as contrasted with .94 and .80, which are exactly the same as the correlations for vectors. Moreover, the results relating Western European Cooperation plus Deterrence to power parity and Cold War behavior to political distance are the same in both bases. Thus, the choice between vectors and magnitudes must be made on the grounds other than the ability to explain variance. In this case, the elegance, ease of mathematical deduction, and pictorial qualities of vectors clearly places the weight on their side.

relative status on dimensions of economic development and power explain most of the Western European plus deterrent behavior of the U.S. Status and homogeneity appear at the aggregate level as more important concepts in explaining U.S. behavior than power or Wright's distance concepts.

U.S. dyadic behavior is patterned at the aggregate level, and a good proportion of this behavior is the consequence of attribute distances from other nations, particularly on economic development, power bases, and political orientation, and geographical distance. The direction of the effect of power distance on U.S. behavior is better explained by status considerations, than by traditional emphasis on power alone.

Were we to consider the hypotheses (1) U.S. conflict behavior is a result of power parity, (2) Cold War behavior or deterrent behavior is a consequence of the closeness in power of the object, (3) U.S. conflict is dependent on power, or similar hypotheses, then they also find little confirmation in the results.¹⁰²

It is interesting to speculate why this should be so. The results suggest a misemphasis on power at the aggregate level, perhaps due to the individual level traditions of theory and research in international relations. At the individual level, the effect of power on international behavior is clear. International relations appear to be shaped by power, as does the political world to the young radical who, disequilibrated on dimensions of wealth, power, and prestige, is trying to fight the establishment. The relevance of status dimensions cannot be seen at the individual level, for they are comparative and aggregative concepts. Status is a construct; power

¹⁰²See also Sullivan (1970) who in a dyadic study of conflict found power parity to have no appreciable correlation with conflict. Only when conflict is considered relative to cooperation does power come in, and then as predicted by status theory.

is an abstraction derived from observation of relative influence.¹⁰³

Similarly in international relations, power is obvious and status is something that has to be pointed out. The findings here and in the works of Galtung, Arafjo, and Schwartzman (1966), Gleditsch (1969), Schwartzman (1966), and Heintz (1969) suggest that in dealing with power in international relations we might put on a different thinking cap.

¹⁰³To borrow a distinction from Etzioni, I am thinking of status as an analytical property of nations. "Analytical properties are not properties of any single unit but are derived from a study of the distribution of unit-attributes. Unlike unit-properties or relational properties [like power], analytical properties cannot be observed. They are 'second order' abstractions." (Etzioni, 1965, p. 19)

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APPENDIX I: DATA SOURCES AND DEFINITIONS

The following sources and definitions are for the variables listed in Table 2 of the text.

1. Exports of books and periodicals US→j: Commodity Trade Statistics, U.N. Statistical Papers, Series D, Vol. 5, No. 4, pp. 573-576.
2. Tourists, US→j: Statistical Yearbook, 1957 and 1963, United Nations; International Travel Statistics, 1955 and 1963; Worldmark Encyclopedea of Nations.
3. Treaties, US→j: Includes all bilateral and multilateral treaties and agreements signed during 1954-1956 and filed with the Secretary-General of the United Nations during the years 1955-1961. Accessions, supplementary agreements, and exchanges of notes were counted along with formal treaties and agreements. Source: Statements of Treaties and International Agreements, UN, monthly publications, January, 1954 to January, 1961.
4. Exports, US→j: Includes re-exports. Source: Statesman's Yearbook 1958, pp. 620-622.
5. Students, US→j: U.S. college students studying abroad during 1955-56 and includes students from U.S. territories. Source: Study Abroad, UNESCO, 1956-58, pp. 64-65.
6. Emigrants, US→j: Demographic Yearbook 1957, United Nations, pp. 618-28, 629-39.
7. Embassy or legation, US→j: Statesman's Yearbook 1955, pp. 625-627. Data as of March 1, 1954.

8. Intergovernmental Organizations of which U.S. and j are comembers: Yearbook of International Organizations 1954-55, pp. 27-227.

9. Agreement US-j on Major 1955 Dimensions of U.N. Voting: The agreement (or similarity) measure of UN voting between the U.S. and nation j is the reciprocal Euclidean distance* between the two nations on the seven major independent dimensions of U.N. voting (roll calls in the Plenary Sessions and Committees). Each dimension was given equal weight in determining the distance. In effect, the agreement measure indexes how close the US and object are on the issues to come before the U.N. For a more thorough description of the data, see Rummel, R. J. Dimensions of Nations, forthcoming.

10. Negative Sanctions Factor Scores, US→j: See variable 12.

11. Military Violence Factor Scores, US→j: See variable 12.

12. Negative Communication Factor Scores, US→j: Variables 10-12 are (orthogonally rotated) factor scores resulting from a previous component factor analysis (Rummel, 1967) of all nation dyads (340) manifesting foreign conflict behavior on any one of sixteen variables: violent acts, planned violent acts, incidences of violence, discrete military acts or clashes, days of violence, negative acts, diplomatic rebuffs, negative communications, written or oral negative communications, unclassified negative communications, accusations, representations or protests, warnings, and anti-foreign demonstrations.

For the negative sanctions factor, the major loadings involved diplomatic rebuff (.71) and incidence of violence (-.60). In 1955, the U.S. rebuffed diplomatically (once each) Burma, China, Czechoslovakia, and Japan. There was incidents of violence for the U.S. involving N. Korea and the U.S.S.R. in 1955.

*Actually, the similarity equals $1 - (d_{i-j} / \max d)$ for all dyads in the U.N.), where d_{i-j} is the Euclidean distance between nations on the 7 major dimensions of U.N. voting and $\max d$ is the largest distance for all the dyads.

For the military violence factor, the major loadings are number of violent acts (.97), planned violent acts (.97), discrete military actions (.97), days of violence (.97), and written or oral negative communications (.65). In 1955, the U.S. had violent military actions with China, U.S.S.R., and N. Korea; planned violent acts and discrete military actions with the same nations; and in total two days of violence with China and the U.S.S.R. and one day with N. Korea. The U.S. expressed written or oral negative communications to China, Egypt, France, Peru, and Rumania once, S. Korea twice, and the U.S.S.R. six times.

For the negative communications factor, the major loadings involved number of negative communications (.95), accusations (.94), written negative communications (.92), oral negative communications (.89), negative acts (.77), warnings (.69), representations (.63).

13. Economic Aid, US+j: Data are for loans and grants, and aid from includes AID predecessors, Social Progress Trust Fund, Food for Peace, and Import-Export Bank. The data for 1955 are the annual average, 1953-57. Source: U.S. Overseas Loans and Grants and Assistance from International Organizations, 1946-1966, Special Report for the House Foreign Affairs Committee, March 17, 1967.

14. Private Investment, US+j: Total direct investment (in material productive or distributive items) as of 1955. Sources: Economic Almanac 1960, Newsweek Edition, p. 470; U.S. Production Abroad and the Balance of Payments, Polk, Meister, and Veit, 1966; U.S. Private and Government Investments Abroad, R. F. Mikesell; Survey of Current Business (various issues); Worldmark Encyclopedea of Nations

15. Military Aid, US+j: Data are for loans and grants and includes Military Assistance Program grants and credits and addition from excess stocks. The data for 1955 are the annual average, 1953-57. Same source as variable 13.

16. Military Commitment, US+j: 1 = at least one such commitment exists in 1955; 0 = no such commitment. A military commitment is defined as the existence of a bilateral or multilateral collective defense treaty between the U.S. and j. Source: Collective Defense Treaties . . ., 91st Congress, First Session, April 21, 1969, pp. 1-14.

17. Official Visits, US+j: Comprises state, official, or personal visits by the President, Vice-President, or Cabinet member to j and not involving participation in an international conference in j by three or more nations. Source: New York Times Index, Information Please Almanac.

18. Military Personnel Stationed in, US+j: Military personnel comprise Army officers and enlisted men serving in j. Source: Strength of the Army, Unclassified CSGPA-332 Department of the Army, June 30, 1955.

19. Conferences, US-j: Number of international conferences U.S. and j coparticipated in during 1955. Such conferences include the U.N. General Assembly and all Security Council meetings. To be a conference, it must be attended by at least three nations. Source: U.S. Department of State Bulletin, 1955.

APPENDIX II: FACTOR ANALYSIS

The following three tables give the results of a component factor analysis of nineteen foreign relations variables for the U.S. Data are for 81 objects of U.S. behavior for 1955. The sample comprises all nations that have been independent for at least two years and have a population greater than 750,000.

Correlations for the component analysis were product moment. Data were not transformed and missing data were estimated using a regression estimation technique (Wall and Rummel, 1969). The component analysis was done using the principal axis technique. All factors with eigenvalues greater than .90 were rotated. The number of factors criteria was lowered slightly below 1.00 to include a specific factor for economic aid and rotation was to the varimax criterion.

Rotated loadings \geq .50 are underlined.

TABLE OF POSITIVE EIGENVALUES

NO.	EIGENVALUE	PERCENT OF COMMUNALITY	
		ALL (19) FACTORS	
1	6.025	31.7	31.7
2	3.035	16.0	47.7
3	2.157	11.4	59.0
4	1.457	7.7	66.7
5	1.219	6.4	73.1
6	0.963	5.1	78.2
7	0.800	4.2	82.4
8	0.772	4.1	86.5
9	0.669	3.5	90.0
10	0.446	2.3	92.3
11	0.396	2.1	94.4
12	0.303	1.6	96.0
13	0.234	1.2	97.3
14	0.174	0.9	98.2
15	0.132	0.7	98.9
16	0.112	0.6	99.5
17	0.067	0.4	99.8
18	0.033	0.2	100.0
19	0.002	0.0	100.0

TRACE OF ORIGINAL MATRIX = 19.000
 COMMUNALITY OVER 10 FACTORS = 19.000

CONFIRMATION ANALYSIS OF 1955 BEHAVIOR OF US IN ALL NATIONS WITH ESTIMATED MISSING DATA.

	1	2	3	4	5	6
SUM SQUARES OVER VARIABLES	6.025	3.035	2.157	1.456	1.217	0.963
PERCENT OF TOTAL VARIANCE	31.708	15.973	11.351	7.666	6.418	5.068

UNROTATED FACTOR MATRIX

VARIABLE COMMUNALITY
NO. NAME 6 FACTORS

1 EXERCISES	0.791	-0.689	-0.016	0.001	0.005	-0.071
2 TOURISTS	0.669	-0.714	-0.016	0.107	0.023	-0.083
3 TEA-TIES	0.736	0.363	-0.069	-0.008	0.127	0.032
4 EXCEPTS	0.556	-0.686	-0.022	0.114	0.068	0.011
5 STUDENTS	0.608	0.656	-0.267	0.226	-0.060	0.233
6 EMIGRANT	0.666	0.060	-0.255	0.157	-0.065	0.009
7 EMPLOYER	0.323	0.213	0.271	-0.466	0.325	-0.060
8 CFW JUDS	0.678	0.289	0.360	-0.305	-0.029	0.267
9 UN VOTE	0.667	0.217	0.268	-0.173	-0.159	-0.006
10 AFC SANG	0.020	0.021	0.133	0.236	0.769	0.109
11 MIL VIOL	-0.041	-0.168	-0.717	-0.572	0.151	0.032
12 AFC COMM	-0.126	-0.129	-0.771	-0.411	0.205	-0.015
13 ECON AID	0.256	0.607	-0.056	0.136	0.180	-0.760
14 MIL AID	0.696	0.543	-0.141	0.126	-0.179	-0.262
15 INVESTM	0.716	-0.550	0.015	0.054	-0.015	-0.063
16 MILCOMIT	0.591	0.305	0.372	-0.315	-0.063	0.169
17 ARMYPERS	0.780	0.341	-0.208	0.331	0.508	0.150
18 CONFEPEM	0.610	0.278	-0.686	-0.050	-0.259	-0.072
19 OFFVISIT	0.158	-0.231	0.463	-0.388	0.231	-0.289

NOT REPRODUCIBLE

COMPONENT ANALYSIS OF 1955 BEHAVIOR OF US TO ALL NATIONS WITH ESTIMATED MISSING DATA.

	1	2	3	4	5	6
SUM SQUARES OVER VARIABLES	3.469	4.245	1.879	2.793	1.260	1.200
PERCENT OF TOTAL VARIANCE	18.257	22.343	9.890	14.600	6.678	6.318

ROTATED FACTOR MATRIX

VARIABLE COMMUNALITY
NO. NAME 6 FACTORS

VARIABLE NO.	NAME	COMMUNALITY	1	2	3	4	5	6
1	EXPROCKS	0.989	0.060	<u>-0.589</u>	-0.013	-0.074	-0.015	0.006
2	TOURISTS	0.946	0.000	<u>-0.971</u>	-0.013	-0.030	-0.004	0.006
3	TREASURES	0.754	<u>0.428</u>	-0.255	0.002	-0.466	0.206	-0.108
4	EXPERTS	0.747	<u>0.257</u>	<u>-0.325</u>	0.024	-0.105	0.093	0.002
5	STUDENTS	0.757	<u>0.316</u>	-0.071	0.046	-0.150	0.152	0.005
6	EMIGRANT	0.852	<u>0.720</u>	<u>-0.549</u>	-0.027	-0.202	0.072	-0.062
7	EMBLEGAT	0.550	-0.058	0.007	-0.109	<u>-0.600</u>	0.172	-0.160
8	COM IGUS	0.870	0.316	-0.142	0.114	<u>-0.844</u>	-0.012	0.117
9	UN VOTE	0.600	0.172	-0.240	0.189	<u>-0.592</u>	-0.133	-0.093
10	NEG SANC	0.669	-0.121	-0.032	0.062	-0.049	<u>-0.805</u>	0.004
11	MIL VIOL	0.909	0.017	-0.031	-0.022	0.011	-0.071	0.068
12	NEG COMI	0.817	0.036	0.022	<u>-0.808</u>	0.168	0.017	-0.000
13	ECON AID	0.885	0.217	0.034	0.050	-0.076	0.092	<u>-0.902</u>
14	MILI AID	0.685	<u>0.664</u>	0.078	0.103	-0.203	-0.046	-0.429
15	INVESTMN	0.938	<u>0.665</u>	<u>-0.059</u>	0.000	-0.130	-0.033	0.029
16	MILCCMIT	0.707	0.287	-0.091	0.194	-0.261	-0.048	0.035
17	ARMYPERS	0.633	0.432	0.015	-0.022	-0.001	0.458	-0.117
18	CCNFEREN	0.750	<u>0.757</u>	-0.102	-0.264	-0.135	<u>-0.203</u>	-0.182
19	OFFVISIT	0.562	<u>-0.456</u>	-0.242	0.018	-0.483	-0.002	-0.229

APPENDIX III: U.S. BEHAVIOR FACTOR SCORES

The factor scores presented here were computed using the formula

$$S = ZF(F'F)^{-1},$$

where S is the matrix of factor scores, Z the standardized data matrix, and F the rotated factor matrix given in Appendix II. Scores are standardized.

The three letter codes used in the factor score listing will be given first, to be followed by the scores themselves.

Nations, Codes, and I.D.s

<u>I.D.</u>	<u>Political Unit</u>	<u>Code</u> <u>Abbreviation</u>	<u>I.D.</u>	<u>Political Unit</u>	<u>Code</u> <u>Abbreviation</u>
1.	Afghanistan	AFG	43.	Japan	JAP
2.	Albania	ALB	44.	Jordan	JOR
3.	Argentina	ARG	45.	Korea (Dem. Rep.)	KON
4.	Australia	AUL	46.	Korea (Rep. of)	KOS
5.	Austria	AUS	47.	Lebanon	LEB
6.	Belgium	BEL	48.	Liberia	LBR
7.	Bolivia	BOL	49.	Libya	LYY
8.	Brazil	BRA	50.	Mexico	MEX
9.	Bulgaria	BUL	51.	Nepal	NEP
10.	Burma	BUR	52.	Netherlands	NTH
11.	Cambodia	CAM	53.	New Zealand	NEW
12.	Canada	CAN	54.	Nicaragua	NIC
13.	Ceylon	CEY	55.	Norway	NOR
14.	Chile	CHL	56.	Outer Mongolia	OUT
15.	China	CHN	57.	Pakistan	PAK
16.	Republic of China	CHT	58.	Panama	PAN
17.	Colombia	COL	59.	Paraguay	PAR
18.	Costa Rica	COS	60.	Peru	PER
19.	Cuba	CUB	61.	Philippines	PHI
20.	Czechoslovakia	CZE	62.	Poland	POL
21.	Denmark	DEN	63.	Portugal	POR
22.	Dominican Republic	DOM	64.	Rumania	RUM
23.	Ecuador	ECU	65.	Saudi Arabia	SAU
24.	Egypt (UAR)	ECP	66.	Spain	SPN
25.	El Salvador	ELS	67.	Sweden	SWD
26.	Ethiopia	ETH	68.	Switzerland	SWZ
27.	Finland	FIN	69.	Syria	SYR
28.	France	FRN	70.	Thailand	TAI
29.	Germany (D.D.R.)	GHE	71.	Turkey	TUR
30.	Germany (Fed. Rep.)	GHW	72.	Union of South Africa	UNS
31.	Greece	GRC	73.	Union of Soviet Socialist Republics	USR
32.	Guatemala	GUA	74.	United Kingdom	UNK
33.	Haiti	HAI	75.	United States of America	USA
34.	Honduras	HON	76.	Uruguay	URA
35.	Hungary	HUN	77.	Venezuela	VEN
36.	India	IND	78.	Yemen	YEM
37.	Indonesia	INS	79.	Yugoslavia	YUG
38.	Iran	IRN	80.	Laos	LAO
39.	Iraq	IRQ	81.	Vietnam (North)	VTN
40.	Ireland	IRE	82.	Vietnam (South)	VTS
41.	Israel	ISR			
42.	Italy	ITA			

-25-

COMPONENT ANALYSIS OF 1955 BEHAVIOR OF US TO ALL NATIONS WITH ESTIMATED MISSING DATA.

VARIABLE NO. NAME	NOT REPRODUCIBLE					
	FACTOR SCORES					
	1	2	3	4	5	6
1 USA-AFG	-0.4635	0.1557	0.1597	0.6554	-0.0440	0.0443
2 USA-ALB	0.2061	-0.0165	0.2154	2.1312	-0.1868	0.4597
3 USA-ARG	-0.0332	0.2982	0.2465	-0.6276	-0.1277	0.5868
4 USA-AUL	0.3274	0.1915	0.1986	-0.9521	-0.7305	0.9565
5 USA-AUS	-0.5927	0.0714	-0.7985	-0.3464	0.0131	-0.1950
6 USA-BEL	1.1094	0.3256	0.3000	-0.8657	-0.4813	0.5493
7 USA-BEL	0.0247	0.3439	0.2024	-0.9624	-0.0145	0.5429
8 USA-BRA	0.3143	-0.0256	0.2779	-1.1211	-0.4250	-1.5260
9 USA-BUL	0.0516	0.0180	0.2323	1.4075	-0.4135	0.6410
10 USA-BUR	-1.1284	-0.0248	0.0185	-0.2855	2.8377	-0.1363
11 USA-CAM	-1.0882	0.0075	-0.0083	0.2417	-0.1484	-1.0885
12 USA-CAN	-0.1912	-0.1438	-0.1416	-0.1954	-0.0193	0.1323
13 USA-CEY	-0.2804	0.2058	0.1268	0.4983	-0.1534	0.3126
14 USA-CHL	0.0921	0.2347	0.2164	-0.6797	-0.0310	0.8328
15 USA-CHN	-0.2434	-0.0290	-2.7290	2.0446	1.5608	0.4025
16 USA-CHT	-0.4571	0.2112	0.3604	-1.0235	-0.6511	-2.3599
17 USA-COL	0.2734	0.0195	0.2767	-0.8273	-0.2489	0.7985
18 USA-COS	-0.9229	0.1623	0.0718	-1.0644	-0.1683	0.1688
19 USA-CUB	-0.6304	-0.3012	0.1534	-1.5235	-0.1938	0.5275
20 USA-CZE	-0.7907	0.1592	0.1051	0.4621	2.0060	0.6440
21 USA-DEN	0.4419	0.3761	0.0145	-0.8194	-0.0761	0.9333
22 USA-EGY	-0.7221	0.1509	0.1500	-1.5304	-0.2555	0.5027
23 USA-ECU	0.0453	0.3200	0.1575	-0.7318	0.0491	0.8629
24 USA-EGP	-0.1958	0.1143	-0.1836	0.2522	-0.0421	0.1707
25 USA-ELS	-0.9669	0.2328	0.0623	-1.1924	-0.1502	0.2751

COMPONENT ANALYSIS OF 1955 BEHAVIOR OF US TO ALL NATIONS WITH ESTIMATED MISSING DATA.

NO.	NAME	FACTOR SCORES					
		1	2	3	4	5	6
26	USA-ETH	-0.2902	0.1718	0.2394	0.4907	-0.2367	0.2190
27	USA-FIN	-0.1152	0.1906	-0.4580	0.1659	0.2259	0.3982
28	USA-FRN	4.4510	0.4613	0.6953	-0.4909	-1.0867	-1.8386
29	USA-GME	-0.0307	-0.0360	0.6161	2.2322	-0.3829	0.3339
30	USA-GRM	2.3859	0.1059	-0.4514	0.0969	4.9401	0.5070
31	USA-GRC	0.5927	0.3183	0.2115	-0.3747	-0.0489	-0.0622
32	USA-GUA	-1.0131	0.2054	0.0652	-1.1009	-0.1646	0.0950
33	USA-HAI	-0.8250	0.2316	0.0473	-1.3428	-0.0662	0.1851
34	USA-HON	-0.7593	0.2192	0.1630	-1.3977	-0.2639	0.2697
35	USA-HUN	-0.5810	0.2200	-1.2434	0.4573	0.6190	0.4176
36	USA-IND	-0.1171	-0.0807	0.0185	0.6940	-0.2027	-1.6255
37	USA-INS	-0.2949	0.1584	-0.3519	0.3884	0.0874	0.2072
38	USA-IRN	-0.4416	0.1365	0.2084	0.5541	-0.1409	-0.7874
39	USA-ISO	-0.3028	0.1589	0.1481	0.5520	0.0152	0.2570
40	USA-ISR	-0.1274	0.0511	0.1717	0.5622	-0.0266	0.4409
41	USA-ISR	-0.1669	0.0326	-1.5326	-0.1092	0.9220	-0.2726
42	USA-ITA	2.0291	0.1500	0.0427	-0.6186	0.0419	-0.7856
43	USA-JAP	0.6818	-0.0337	0.4347	-0.5790	3.8619	0.2411
44	USA-JOR	-0.4190	0.1704	0.1605	0.7045	-0.0674	0.1198
45	USA-KCI	0.3561	-0.0413	1.6469	2.6475	-2.2283	0.1307
46	USA-KOS	-0.1801	0.2289	0.2592	0.5278	1.5446	-4.5410
47	USA-LAO	-1.0951	-0.0105	-0.0145	0.3442	-0.1246	-1.2027
48	USA-LEB	-0.2214	0.1915	0.1715	0.3649	-0.2302	0.3542
49	USA-LBP	-0.3561	0.1586	0.2028	0.5253	-0.1331	0.2403
50	USA-LBY	-0.2636	0.0906	0.1222	0.7152	0.1226	-0.0272

COMPONENT ANALYSIS OF 1955 BEHAVIOR OF US TO ALL NATIONS WITH ESTIMATED MISSING DATA.

VARIABLE	FACTOR SCORES					
	1	2	3	4	5	6
51 USA-MEX	-0.7130	-0.5228	0.1326	-1.3729	-0.0729	0.3955
52 USA-REP	-0.3736	0.1450	0.1205	0.9684	-0.1132	0.1086
53 USA-NTH	1.1485	0.1705	0.3054	-1.1065	-0.4867	0.7543
54 USA-NEW	0.1670	0.2074	0.2011	-0.5396	-0.7621	0.6951
55 USA-NIC	-0.6983	0.2334	0.2040	-1.4471	-0.3961	0.3533
56 USA-ACP	0.4242	0.3158	0.2915	-0.7746	-0.4009	0.7094
57 USA-CUT	0.0274	-0.0604	0.6150	2.3455	-0.3768	0.3656
58 USA-PAK	0.4702	0.3263	0.0519	-0.2493	-0.4255	-1.2994
59 USA-PAN	-0.7841	0.1670	0.1844	-1.4434	-0.3439	0.2574
60 USA-PAR	-0.0774	0.2846	0.3120	-0.7870	-0.3446	0.8231
61 USA-PER	0.0653	0.2973	0.6251	-0.6454	-0.0201	0.5307
62 USA-PHI	0.4983	-0.0327	0.0735	-0.2145	-0.2675	0.1854
63 USA-FOL	-0.4492	0.2228	-0.0534	0.4971	0.1141	0.4465
64 USA-POR	0.7062	0.1875	0.7342	0.7625	-0.7056	1.0294
65 USA-RUP	-0.4770	0.1684	0.1138	0.7040	0.3522	0.3182
66 USA-SAL	-0.4976	-0.0569	0.1408	0.9467	0.0093	0.2303
67 USA-SPN	0.0250	0.0943	0.3042	0.3120	-0.1445	-1.0366
68 USA-SWC	-0.0050	0.0740	0.2640	0.0012	-0.2225	0.7605
69 USA-SWZ	1.3421	0.2293	0.3786	0.5039	0.3552	1.4177
70 USA-SYR	-0.3849	0.1907	-0.2103	0.5822	0.1874	0.4253
71 USA-TAI	-0.6030	0.1896	-0.0228	-1.0159	-0.4046	-0.4586
72 USA-TUR	0.5454	0.3846	0.3083	-0.7110	-0.9239	-1.3216
73 USA-UIS	0.3653	-0.1309	0.8095	1.0479	-0.7739	0.5704
74 USA-USR	0.5183	0.3664	-7.7364	0.0950	-2.0014	0.1129
75 USA-UNK	4.4201	-1.1293	-0.3748	-0.4514	-1.0310	-0.6808

COMPONENT ANALYSIS OF 1955 BEHAVIOR OF US TO ALL NATIONS WITH ESTIMATED MISSING DATA.

VARIABLE

NO.	NAME	5	FACTOR SCORES					
			1	2	3	4	5	6
76	USA-URA	-0.1515	0.4203	0.2212	-0.5107	-0.1297	1.0588	
77	USA-VTN	0.0274	-0.0604	0.6159	2.3455	-0.3768	0.3656	
78	USA-VTS	-1.2049	-0.0038	0.1033	0.2858	-0.1979	-3.7856	
79	USA-VEN	-0.9368	-1.0614	0.1912	-1.1770	-0.3381	0.4210	
80	USA-YEM	-0.4731	0.1512	0.1315	1.0015	0.0263	0.1893	
81	USA-YUG	-0.7230	0.0320	-0.2763	-0.1712	0.3503	-2.3595	

NOT REPRODUCIBLE

APPENDIX IV: CANONICAL ANALYSIS

The following tables present the major canonical results.

The first table gives the canonical correlations, significance levels, and trace canonical correlation (the correlation between the two spaces). The formula for lambda, Λ , is

$$\Lambda = \prod_{k=1}^q (1 - r_k^2),$$

where q is the number of canonical correlations, k is the k^{th} canonical correlation r . The chi-square equals $-(n - 0.5(p + q + 1)) \log_e \Lambda$, where n = the number of dyads (81), q = the number of behavioral dimensions (6), and p = the number of distances (14). The degrees of freedom equal $\{p - (k - 1)\}\{q - (k - 1)\}$ and the Z transformation is for reference to corresponding areas under the normal curve. The trace correlation is,

$$\text{trace} = \left(\sum_{k=1}^q r_k^2 / q \right)^{1/2}.$$

The second table gives the canonical coefficients and are equivalent to regression coefficients.

The third table shows the canonical structure matrix, which gives the correlations of the variables with the canonical variables and their communality.

The fourth table lists how much of the proportion of total variance in the variables is accounted for by each of the canonical variates.

In evaluating the direction of relationship between distances and the patterns of behavior, careful attention must be given to the direction of loadings on the pattern in the factor loading matrix of Appendix II. For example, the high loadings on the Anglo-American pattern are negative. This means that dyads with Anglo-American behavior will have large negative factor scores. Thus, in evaluating the canonical coefficients for Anglo-American behavior, their signs should be reversed to get the proper direction of relationship of distances to high magnitudes of this behavior.

NOT REPRODUCIBLE

FIELD THEORY TEST-CANON ANALYSIS-ALTERNATES WITH 6 FACTORS R-SPACE

DETERMINANT OF R11 = 0.3514653E-01

DETERMINANT OF R22 = 0.1000000E 01

NUMBER OF EIGENVALUES REMOVED	EIGENVALUE	CORRESPONDING CANONICAL CORRELATION	LAMBDA	CHI-SQUARE	DFGPEFS OF FREEDOM	Z-TRANSFORMATION
1	0.89011	0.93814	0.00771	343.00195	84	D.F. 230
2	0.67730	0.82298	0.06631	193.45943	65	13.26887
3	0.52848	0.72711	0.10927	113.72200	49	8.31264
4	0.33840	0.58172	0.42280	60.69034	33	5.33445
5	0.21796	0.56370	0.63906	31.56720	20	2.05593
6	0.06316	0.25131	0.93684	4.59053	9	1.70072
						-1.09011

TRACE CORRELATION = 0.68390

NOT REPRODUCIBLE

FIELD THEORY TEST-CANNI ANALYSIS-ALTERNATES WITH 6 FACTORS B-SPACE

CANONICAL STRUCTURE MATRIX
 CANONICAL VARIATES

LEFT HAND VARIABLES	1	2	3	4	5	6	
1 ENERGY/CAP	0.793	-0.571	-0.337	0.046	-0.007	-0.148	-0.025
2 NAT INCOME	0.362	-0.067	-0.066	-0.101	-0.045	0.104	0.007
3 FUEL OPPOSE	0.591	-0.067	-0.640	-0.000	0.111	0.300	0.026
4 THREATS	0.857	-0.614	0.367	0.306	0.613	-0.171	0.111
5 DENSITY	0.409	-0.240	-0.107	-0.617	0.005	0.100	-0.003
6 CATHOLIC/CAP	0.610	0.103	-0.671	0.207	0.215	-0.010	-0.127
7 POP CONFLICT	0.355	-0.064	0.109	0.111	0.049	-0.010	-0.550
8 RELIGIOUS	0.708	-0.105	0.407	0.190	-0.116	0.626	-0.225
9 FOREIGN STUD	0.166	-0.123	-0.129	-0.086	-0.004	-0.111	-0.131
10 EDUCAT XFENS	0.212	0.054	-0.272	0.170	0.220	0.075	-0.272
11 EXPORTS/GRP	0.510	0.155	-0.470	0.212	-0.051	-0.302	-0.147
12 LANGUAGE GRP	0.350	-0.141	0.352	0.229	0.007	0.210	0.245
13 PROTEINS/CAL	0.308	-0.145	0.046	-0.012	-0.008	0.101	-0.404
14 GEOGRAPHIC	0.505	-0.176	-0.508	0.473	-0.042	-0.020	-0.007

CANONICAL STRUCTURE MATRIX (CONTINUED)

	CANONICAL VARIATES					
RIGHT HAND VARIABLES H-SOR.	1.	2	3	4	5	6
1 WESTERN EUROPEAN	1.000	0.709	0.359	0.028	0.235	-0.147
2 ANGLO-AMERICAN	1.000	-0.231	0.361	-0.819	0.274	0.215
3 DETERRENCE	1.000	-0.660	0.523	0.317	0.035	-0.207
4 COLD WAR	1.000	0.011	0.354	0.272	0.322	0.000
5 NFG SANCTION	1.000	0.061	0.262	0.202	-0.306	0.251
6 FCCR AID	1.000	-0.076	-0.327	0.219	0.770	0.305

FIELD THEORY TEST. CANONICAL ANALYSIS-ALTERNATES WITH 6 FACTORS B-SPACE

NOT REPRODUCIBLE

CANONICAL COEFFICIENTS

LEFT HAND VARIABLES	CANONICAL VARIATES					
	1	2	3	4	5	6
1 ENERGY/CAP	-0.111	-0.164	0.225	<u>-0.165</u>	-0.106	0.276
2 NAT INCOME	<u>-0.165</u>	-0.062	<u>-0.162</u>	0.014	0.101	-0.176
3 FUSE URGEISE	0.016	<u>-0.556</u>	0.007	0.298	<u>-0.526</u>	0.236
4 THREATS	-0.220	0.137	<u>0.203</u>	<u>0.180</u>	-0.226	0.101
5 DENSITY	-0.032	-0.100	<u>-0.594</u>	0.313	0.102	-0.097
6 CATHOLIC/CAP	0.063	<u>-0.473</u>	-0.065	<u>-0.444</u>	-0.107	0.263
7 NON CONFLICT	-0.066	0.010	0.094	0.162	-0.191	<u>-0.500</u>
8 RELIGIOUS	0.062	0.289	<u>0.305</u>	-0.264	<u>0.163</u>	-0.262
9 FOREIGN STUD	-0.007	0.137	-0.030	-0.127	-0.169	-0.471
10 EDUCAT XPENS	-0.054	0.052	0.129	-0.032	-0.076	-0.108
11 EXPORTS/GRIP	0.012	-0.131	0.063	0.069	-0.220	<u>-0.432</u>
12 LANGUAGE GRP	-0.028	0.033	0.122	-0.174	-0.112	0.103
13 PROTEINS/CAL	0.063	0.062	-0.136	-0.005	0.147	-0.179
14 GEOGRAPHIC	-0.030	-0.035	<u>0.107</u>	<u>-0.464</u>	0.166	-0.143

CANONICAL COEFFICIENTS (CONTINUED)

VARIABLES RIGHT HAND VARIABLES	CANONICAL VARIATES					
	1	2	3	4	5	6
1 WESTERN EUROPEAN	<u>0.700</u>	0.358	<u>0.540</u>	0.028	0.235	-0.147
2 ANGLO-AMERICAN	-0.231	-0.110	0.351	<u>-0.819</u>	0.279	0.235
3 DETERRENCE	<u>-0.670</u>	0.384	<u>0.523</u>	0.317	0.035	-0.207
4 COLD WAR	0.011	<u>-0.795</u>	0.354	0.372	0.322	0.079
5 NEG SANCTION	0.061	0.065	0.269	0.202	<u>-0.394</u>	<u>0.451</u>
6 ECUN AID	-0.076	0.276	<u>-0.327</u>	0.219	<u>0.779</u>	0.395

FIELD THEORY TEST-CANONICAL DISJUNCTIVES WITH 4 FACTORS IN SPACE

VARIATE	CANONICAL CORRELATION	PROPORTION OF LEFT HAND VARIANCE	PROPORTION OF RIGHT HAND VARIANCE	PROPORTION OF TOTAL VARIANCE
1	0.93016	12.090	15.667	14.016
2	0.82298	15.151	16.667	15.667
3	0.72711	7.677	16.667	10.241
4	0.58172	4.027	15.667	8.372
5	0.56379	6.006	16.667	0.204
6	0.25131	53.617	15.667	10.425
		100.000	100.000	67.531

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15. ABSTRACT The foreign relations of the United States is considered in terms of six hypotheses based on (1) the linkage "pre-theory" of James Rosenau, (2) the social status theory of Johan Galtung, (3) the distance theory of Quincy Wright, (4) the power transition theory of A. F. K. Organaki, (5) the integration-regional findings of Bruce Russett, and (6) propositions about geographic distance. These hypotheses are linked together by the notion of a distance vector, interpreted in terms of the constructs of "attribute space," "behavior space," and "dyads," and developed within a geometric framework called field theory. To test this field theory and hypotheses subsumed by it, data on nineteen foreign relations and actions of the U.S., ranging from tourists and treaties to negative communications and sanctions, toward 81 object nations were correlated (using canonical analysis) with the distances between the U.S. and other nations on economic development, size or power bases, political orientation, socio-cultural dimensions, and geographic distance. The general results support the "pre-theory" of Rosenau, the status theory of Galtung, and an emphasis on homogeneity in integration theory. This suggests that these theories can be synthesized in a larger framework such as field theory. Two specific results are: (1) U.S. behavior toward other nations consist of six independent patterns: Western-European Cooperation, Anglo-American Cooperation, Aid, Cold War behavior, Deterrence, and Negative Sanctions; (2) joint Western-European Cooperation (such as treaties, military aid, students, and conferences) and Deterrent Action of the U.S. toward another nation are a function of the power party of the object nation (with a multiple correlation of .94).			

KEY WORDS	LINE A		LINE B		LINE C	
	ROLE	WT	ROLE	WT	ROLE	WT
U.S. Foreign Policy Conflict Integration Distance Cooperation Aid Cold War Deterrence Europe						