THE DIMENSIONALITY OF NATIONS PROJECT

RESEARCH REPORT

DEPARTMENT OF POLITICAL SCIENCE

UNIVERSITY OF HAWAII

FACTOR 3

FACTOR 2

FACTOR 1

AD711331

54

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

RESEARCH REPORT NO. 42

The Conflict Environment of Nations
A Study of Conflict Inputs to Nations in 1963*

Warren R. Phillips**

July 1970

DOCUMENT CONTROL DATA · R & D

Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1 ORIGINATING ACTIVITY (Corporate author)	2a. REPORT SECURITY CLASSIFICATION
DIMENSIONALITY OF NATIONS	UNCLASSIFIED
	2b. GROUP

3 REPORT TITLE

THE CONFLICT ENVIRONMENT OF NATIONS: A STUDY OF CONFLICT INPUTS TO NATIONS IN 1963.

4 DESCRIPTIVE NOTES (Type of report and inclusive dates)
RESEARCH REPORT NO. 42

5 AUTHOR(S) (First name, middle initial, last name)

WARREN R. PHILLIPS

6 REPORT DATE	7a. TOTAL NO. OF PAGES	7b. NO OF REFS
JULY 1970	49	37

8a. CONTRACT OR GRANT NO	9a. ORIGINATOR'S REPORT NUMBER(S)
N00014-67-A-0387-0003	Research Report No. 42
b. PROJECT NO	
c.	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)
d.	

10 DISTRIBUTION STATEMENT

This document has been approved for public release and sale; its distribution is unlimited and reproduction whole or in part is permitted for any purpose of the United States Government.

11 SUPPLEMENTARY NOTES	12 SPONSORING MILITARY ACTIVITY
2500 Campus Road Honolulu, Hawaii 96822	

13 ABSTRACT

This research was designed to answer three specific questions about the conflict behavior of nations: (1) What are the dimensions of variation in environmental inputs to nations from the international conflict system? (2) To what degree is a nation's conflict activity a response to these conflict stimuli from the environment? (3) Which characteristics of nations explain deviations from a simple stimulus-response model of conflict behavior? The work reported here is designated to produce systematic information about contemporary patterns of conflict behavior. It is based upon the belief that behavior begets behavior. To this end, data have been collected on several measures of foreign conflict behavior for all nations exhibiting conflict in 1963. These data were organized into two matrices. The first matrix is an input matrix in which each observation represents the total amount of conflict behavior received by a nation regardless of sender. The second matrix is an output matrix in which observation is a record of the nation's total conflict behavior. The data in these matrices were each intercorrelated and factor analyzed. The factors derived from each matrix were then compared to assess the relationship between inputs and outputs of nations by use of canonical regression techniques. The residuals (conflict variance which is independent of this relationship) from the above analyses were then regressed on a set of twenty-two variables of nations characteristics which represented the basic patterns of attributes found by Rummel in 1963.

The conflict environment of nations was found to be composed of four major patterns of conflict experience. A high correlation between conflict actions sent and received was found. The discrepancies were found to be related to national characteristics.

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

THE CONFLICT ENVIRONMENT OF NATIONS:
A STUDY OF CONFLICT INPUTS TO NATIONS IN 1963

by
Warren R. Phillips, University of Hawaii

ABSTRACT

This research was designed to answer three specific questions about the conflict behavior of nations:
  (1) What are the dimensions of variation i r environmental inputs to nations from the international conflict system?
  (2) To what degree is a nation's conflict activity a response to these conflict stimuli from the environment?
  (3) Which characteristics of nations explain deviations from a simple stimulus-response model of conflict behavior?
The work reported here is designated to produce systematic information about contemporary patterns of conflict behavior. It is based upon the belief that behavior begets behavior. To this end, data have been collected on several measures of foreign conflict behavior for all nations exhibiting conflict in 1963. These data were organized into two matrices. The first matrix is an input matrix in which each observation represents the total amount of conflict behavior received by a nation regardless of sender. The second matrix is an output matrix in which each observation is a record of the nation's total conflict behavior. The data in these matrices were each intercorrelated and factor analyzed. The factors derived from each matrix were then compared to assess the relationship between inputs and outputs of nations by use of canonical regression techniques. The residuals (conflict variance which is independent of this relationship) from the above analyses were then regressed on a set of twenty-two variables of national characteristics which represented the basic patterns of attributes found by Rummel for 1963.

The conflict environment of nations was found to be composed of four major patterns of conflict experience: Official Military Violence, Negative Sanctions, Unofficial Violence/Negative Communications and Warning and Defensive Acts. A high correlation between conflict actions sent and received was found. Thus nations which engage in military violence received military violence from the international environment. Those nations which experienced deviations from the expected relationship of conflict sent to conflict received were identified and the discrepancies were found to be related to national characteristics. The paper suggests an alternative way to conceive the national international linkage problem and demonstrates a linkage between domestic violence and international conflict.

The Conflict Environment of Nations:
A Study of Conflict Inputs to Nations in 1963.

INTRODUCTION

This research was designed to answer three specific questions about the conflict behavior of nations:

(1) What are the dimensions of variation in conflict received by nations from the international environment?

(2) To what degree is a nation's conflict activity a response to conflict it receives from the environment?

(3) Which characteristics of nations explain deviations from a simple stimulus-response model of conflict behavior?

The work reported here is designed to produce systematic information about contemporary patterns of conflict behavior. It is based upon the belief that behavior begets behavior. To this end, data have been collected on several measures of foreign conflict behavior for all nations exhibiting conflict in 1963. These data were organized into two matrices. The first is an input matrix in which each observation represents the total amount of conflict behavior received by a nation regardless of sender. The second is an output matrix in which each observation is a record of a nation's total conflict behavior. The data in each matrix were intercorrelated and factor analyzed. The factors derived were then compared by use of canonical regression techniques to assess the degree of correlation between inputs and outputs of nations. The residuals (conflict variance independent of this relationship) from the analysis of conflict sent and received were then regressed on a set of twenty-two variables of national characteristics representing the basic patterns of attributes found for 1963.[1]

---

[1]This analysis has not been reported to date.

variables at some initial time and knowledge of the relations
among the variables allows us to predict (deterministically or
probabilistically) the state of the sytem at some arbitrary
future time, we have a dynamic theory of the system. If we can
infer only the values of some of the variables from those of
others at a specified moment of time, we have a static theory.
(p. 114-115)

In this study no attempt will be made to ascertain the stability of
these patterns over time. This is a cross sectional analysis. However,
the possibility that patterns so delineated may represent dynamic patterns
should not be dismissed cavalierly.[2]

Boulding's thought-provoking piece is especially applicable to the
current period of international politics. The post World War II period has
produced a great deal of conflict. The emerging patterns of conflict between
nations has tended to cloud the once clear distinction between peace and war.
Throughout this period, several situations have exhibited quasi-peace altern-
ating with quasi-war relationships; Indian-Pakistan and Arab-Israeli relations
are examples. The Soviet Union and the United States have also experienced
these fluctuations in certain places during certain time periods. These
developments call for a renewed interest in conflict studies.

Current research efforts have concentrated quite heavily upon the
topic of conflict behavior. Previous work has provided a good deal of in-
formation about conflict in the international system over time (Singer and
Small, 1967; Denton and Phillips, 1968; Wright, 1942; Richardson, 1960;
Moyal, 1949; and Rosecrance, 1963), between select pairs of nations over
time (McClelland *et al.*, 1965; McClelland, 1968; North *et al.* 1968; Whiting,
1960; and Smoker, 1969) or for all nations at a single point in time (Rummel,
1967, 1969; and Tanter, 1966). The last work has considered the behavior of

---

[2]Elsewhere, (1969) I have shown that there is a good deal of stability
in conflict patterns.

Conflict Interaction

The focus of my interest in conflict is on interaction--the interplay of conduct--and, therefore, on social process. In the terminology current in the international relations field, McClelland (1966), Rosenau (1963), Singer (1961), Snyder (1954), and Sondermann (1961), the emphasis is on the workings of the international conflict system more than on the analysis of foreign policies. I wish to bring into focus a large number of the aspects, modes and functions of international political communications. Others have sug-- gested approaches for analyzing this system. Boulding (1962), for example, has sketched a static model of competition within which he locates the con- cept of conflict. Parties to conflict are identified, the "positions" of parties in a behavior space are conceptualized, and conflict is defined "as a situation of competition in which the parties are aware of the incompatib- ility of potential future positions, and in which each party wishes to occupy a position which is incompatible with the wishes of the other" (p. 5). The result is the identification of the indifference area (or "set"), the conflict area, and the trading or bargaining area. Boulding proceeded to sketch in a dynamic model. This extension of his static model borrows heavily from the Richardson process and econometrics. Elsewhere I have suggested a dynamic extension similar to Boulding's but employing linear algebra and factor analysis (Phillips, 1970).

The analysis reported here can be characterized as a static study of the international system. In so defining this study, I have accepted Rapoport's definition of "system" and "static."

> Mathematically speaking a portion of the world can be called a system if (1) at any given time the "state" of this portion can be described by a set of values assigned to some selected set of variables, and (2) relations of interdependence can be ascribed to the variables. If, in addition, knowledge of the values of the

nations toward the environment (bynation behavior), the behavior of nations
aimed at specific opponents (dyadic behavior), or the total behavior of all
nations for a given time period (systemic behavior). In contrast, I will
investigate the conflict inputs to each nation (byobject). I will do this
by making each observation the total behavior of all nations toward a specific
object nation.

Recently a conceptual framework which incorporates the environmental
concerns of this analysis into a larger milieu has gained acceptance in
international relations. Rosenau (1969) suggests that we look at the environ-
mental linkages with the internal processes of nation states. For Rosenau
the "environment of a polity is conceived to be equivalent to the same
phenomena as comprise any international system of which the polity is a
component part" (1969, p. 45 on). For the purpose of this study, the relevant
environment is the international conflict system. For simplicity, consider
a three-nation system as in Figure 1. Each pair of actors is engaging in
interaction. The conflict exchanged between nations is the conflict environ-
ment of nations and the total conflict behavior received by a specific nation
is the conflict it receives from the international environment. Karl Deutsch
(1968) has suggested that the highest of a nation's basic functions is its
ability for self transformation, "to respond to events in its environment
in new ways, or at least in different and more rewarding ways" (1968, p. 17).
It is assumed in this paper that nations, attempting to cope with the conflict
received will pattern their responses in ways they believe most rewarding.
Thus, changes in the conflict environment of nations influences either the
foreign policy decision-making process within nations or the nation's conflict
behavior with specific opponents.[3]

_____

[3]"States are political systems operating within an environment of other
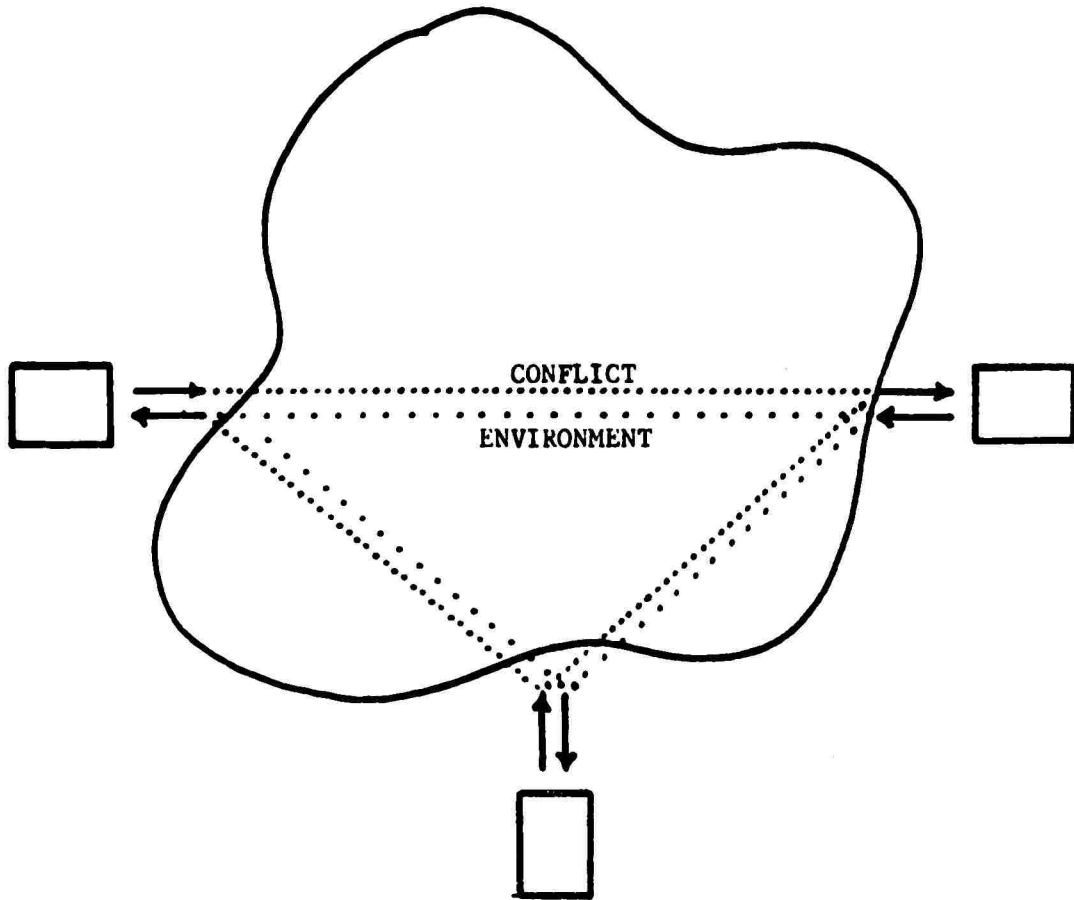systems to which they are adapting and responding." (Burton, 1969, p. 10).

FIGURE I

Rosenau asserts that when we consider the environment as a set of variables rather than as constraints in the functioning of polities, we "permit comparisons of the stability of different international systems in terms of the varying ways in which polities may be linked to them." This approach would seem to call for the delineation of specific patterns of conflict. The development of a series of variables, each independent of the other, would provide a means of testing linkages between environmental inputs and national responses. The research I am involved in will consider these environmental inputs as influences acting upon the normal demand-response sequences of nations involved in conflict. Thus, the amount and type of conflict a nation is receiving from the international system should influence its readiness to initiate new conflict behavior. The linkage between conflict sent and received on the part of specific nations will be made by comparing the total conflict behavior aimed at a specific nation with the conflict that a nation initiates to the system.

This linkage between demand and response behavior has been investigated previously in a number of ways. Using perceptual data, but not action data, Zinnes tested four hypotheses about the symmetric relationship between perceptions and expressions of hostility by key decision-makers in the 1914 crisis (1968). The four hypotheses tested were:

(1) If x perceives itself the object of hostility, then x will express hostility;

(2) If x perceives itself the object of y's hostility, then x will express hostility toward y;

(3) If x expresses hostility toward y, then y will perceive that it is the object of x's hostility;

(4) If x expresses hostility toward y, then y will express hostility toward x. (1968, p. 86-7)

In commenting on this study, Holsti, North and Brody suggest

> Zinnes tested each hypothesis under various time-lag models,
> using both frequency and intensity of statements. Only hypo-
> theses one and two were supported at statistically significant
> levels in her study. One interpretation of these findings
> might be that in crisis 'actions speak louder than words';
> that is, in hypotheses one and two, x's perceptions are probably
> based on both y's actions and y's expressions. Hypotheses three
> and four, however, are concerned only with the relationship of
> expressions of attitude and perceptions of these attitudes. Thus,
> Zinnes' study suggests the limitations of working solely with
> perceptual data, to the exclusion of action data. (p. 157)

They tested the stimulus-response model further but added perceptual variables

as possible mediating forces.

> The analysis of the 1914 crisis began with an assumption basic
> to most traditional theories of international politics—that is,
> the assumption of congruence between input (S) and output (R) action.
> The data revealed, however, a significant difference between the
> two coalitions corresponding to the different levels of involvement
> in the situation. Congruence between (S) and (R) was high for the
> members of the Triple Entente, which became involved only very late
> in the crisis. The level of congruence was much lower for the
> nations of the Dual Alliance, which were engaged for essentially
> the entire crisis period.
> Having failed to account for the escalation from a local
> incident to a general war with only the action variables, the
> perceptual variables (r) and (s) were analyzed. The various links
> across the model were examined and no significant difference between
> the two coalitions in regard to the s-R step was found: (R) was
> higher than (s) in both cases. As predicted, there was little dif-
> ference between the Triple Entente and Dual Alliance in the r-s
> link, both perceiving themselves as less hostile than the other
> coalition. A significant difference did appear at the S-r step,
> however. The leaders of the Dual Alliance consistently over-
> perceived the actions of the Triple Entente. Thus the S-r link
> served a 'magnifying' function. The decision-makers of the Triple
> Entente, on the other hand, tended to under-perceive the actions
> of the Dual Alliance. This difference in perceiving the environment
> (the S-r link) is consistent with the pronounced tendency of the
> Dual Alliance to respond at a higher level of violence than the
> Triple Entente. (1968, p. 137)

The symmetry of conflict behavior has also been investigated.

Operationalizing symmetry has led to interesting definitional conflicts.

Symmetry can be defined as the correspondence in quantity, form and arrange-

ment of conflict input and output or it can be defined as the regularity of
pattern or form with reference to corresponding behavior of input and output.
It is the latter definition of symmetry which will be accepted here. Thus,
if nations receiving relatively high amounts of a specific conflict behavior,
respond by relative , large amounts of the same type of conflict, the relation-
ship is symmetric. No attempt is made to state an equality in the quantity
of input and output. In order not to confuse the reader, the term correlation
will be used throughout the reporting of results instead of symmetry.

Ed Azar (1970), reasserting the symmetry of conflict behavior, tested
the relationship on data gathered from an international subsystem composed
of Britain, France, Israel, and Egypt for the time period, January 1956
through December 1957. He found conformation for symmetry in the level of
hostility. Thus, when Britain, France, and Israel increased or decreased
their level of hostility towards Egypt, the latter responded by increasing
its conflict behavior.

Two further aspects of the relationship of conflict sent to conflict
received are worth pursuing at this stage. The first is to analyze this
potential correlation over all nations rather than a selected subsample. The
distinction here would be between the possibility that a relationship holds
for only certain groups of nations and that any theory of conflict interaction
must include a category system which subdivides nations into groups. Altern-
ately, if there are strong relationships between stimulus and response behavior
in conflict that hold for the system, it may not be necessary to look only at
subsets of the international system. This study will incorporate all nations
which received conflict from the international environment.

The second step will be to examine a series of conflict variables. In
adopting the approach, I reject the notion that international conflict can be
measured by a single indicator such as the number killed or the amount of

hostility. Such indicators represent only aspects of conflict, although important ones. I will be seeking the dimensions of conflict directed toward national recipients that are found to be independent of each other, and for the smallest number of such dimensions. Given the difficulty of using single variable indices for any one concept, i.e., poor data with unknown sources of random and systematic error and validity problems of the definitions, the researcher is faced with a situation similar to Heisenberg's indeterminancy principle in quantum physics. He cannot measure the precise position or "change" cf a nation in the system. Therefore, I have moved to methods that deal with probability densities: methods that define stable structure among arrays of environmental behavior. In those areas where several variables tend to provide dense clusters of information, I am most likely to find the best measures for describing international conflict environment.

The relationship between simple Stimulus-Response theories and the concept of linkage suggested by Rosenau is supported by arguements from psychology. Charles Osgood (1956), in a review of analytical approaches to psychology, pointed out that all of psychology is a study of what goes into an organism or organization (stimulus) and what comes out (response). The task for all social scientists is the explanation and prediction of relation-ships among these two sets of observables, stimuli and responses, and to do this they must make certain assumptions about what goes on in "the little black box" between stimulus and response. Osgood warns about the tendency to collect a different explanatory device for every event--this process of adding a new explanation for each finding results in what he termed "junk box psychology." This mass conglomeration of *ad hoc* explanations can be prevented in a number of ways.

---

[4]For a discussion of the differences between scaling and event approaches to conflict interaction, see McClelland, 1970.

In an attempt to specify the aspects of polities which serve or give
rise to inputs and outputs of nations, Rosenau lists 25 such aspects of
nations. These are given in Table I. The approach preferred by Rosenau
is to analyze these linkages. In contrast, I prefer to look at the stimulus-
response linkage first--to what extent can a nation's outputs be predicted by
knowing that nation's conflict received? When I know the extent to which
this behavior is correlated, I will then attempt to account for deviations
from this symmetry by national characteristics (or the aspects of polities
in Rosenau's terms). Specifying Rosenau's "environments" as the conflict
environment, I plan to delineate separate patterns in this environment by
designating a set of independent patterns (factors) through factor analysis.
I have chosen to take the same approach in delineating national characteris-
tics. The next sections will specify the conflict environment, the conflict
output and the national characteristics of nations employed in this study.

II.   The Conflict Environment of Nations

2.1   Conflict Behavior

The data used in this analysis have been collected from the daily New
York Times, using the foreign conflict code sheet given in Rummel (1966). The
data collected includes actors, objects, date, and type of conflict act or
action. The information in the code sheets for 1963 were reorganized into
a set of 23 conflict variables presented in Table II. The variables represent
combinations of coded information in the code sheet. The data had to be re-
organized from an actor to object or dyadic frame to a world to object or
by object frame. This was accomplished by summing the behavior of all actors
to a specific object.

Some questions have been raised about the reliability problems associa-
ted with the use of a single newspaper. It is likely that the New York Times

TABLE I

A PROPOSED LINKAGE FRAMEWORK

ENVIRONMENTAL → POLITY ↓ Outputs and Inputs		The Contiguous Environment	The Regional Environment	The Cold War Environment	The Racial Environment	The Resource Environment	The Organizational Environment
Actors	1. Executive Officials						
	2. Legislative Officials						
	3. Civilian Bureaucrats						
	4. Military Bureaucrats						
	5. Political Parties						
	6. Interest Groups						
	7. Elite Groups						
Attitudes	8. Ideology						
	9. Political Culture						
	10. Public Opinion						
Institutions	11. Executive						
	12. Legislatures						
	13. Bureaucracies						
	14. Military Establishments						
	15. Elections						
	16. Party Systems						
	17. Communications Systems						
	18. Social Institutions						
Processes	19. Socialization and Recruitment						
	20. Interest Articulation						
	21. Interest Aggregation						
	22. Policy-Making						
	23. Policy-Administration						
	24. Integrative-Demonstrative						

*from Linkage Politics, James N. Rosenau (ed.), New York: The Free Press, 1969.

TABLE II

DYADIC FOREIGN CONFLICT VARIABLE LIST WITH CODES*

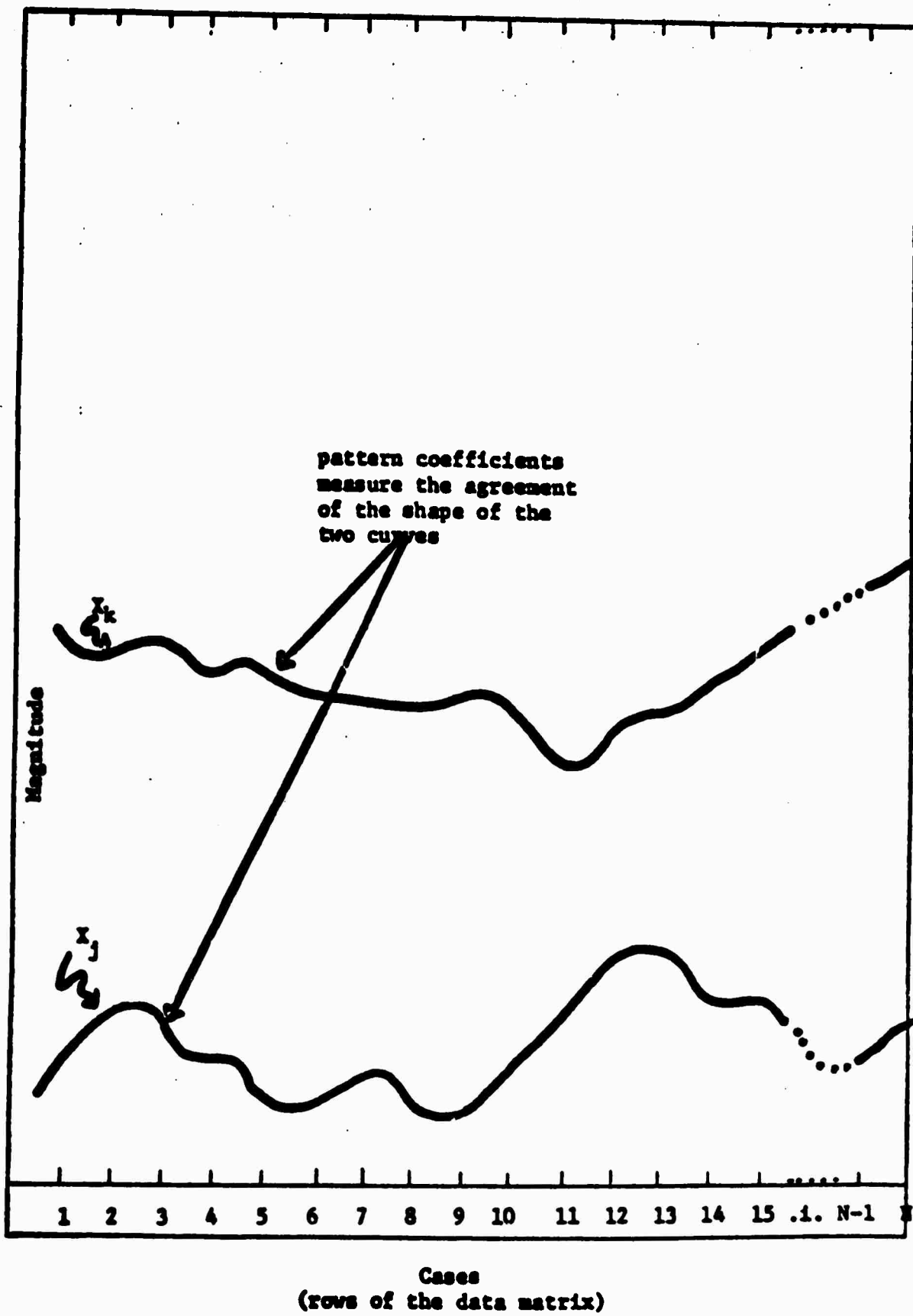| Primary Category	Variable No.	Code		Variable
warning and defensive acts	1	WARNDF	–	Military Maneuvers or Troop Movements
	2	ALRTMB	–	Alerts and Mobility
official acts of violence	3	PLNVIL	–	Planned Violent Acts
	4	WARACT	–	Overt Violence
	5	DISCMA	–	Discrete Military Actions, Clashes
	6	DAYVIL	–	Days of Violence
negative sanctions	7	NEGACT	–	Negative Behavior Acts
	8	UNCNEG	–	Unclassified Negative Acts
	9	SEVDPR	–	Severence of Diplomatic Relations
	10	EXPREC	–	Expulsion or Recall
	11	BCOTEM	–	Boycott or Embargo
	12	AIDREB	–	Aid to Rebels
negative communications	13	NEGCOM	–	Negative Communications
	14	WRTCOM	–	Written Negative Communication
	15	ORLCOM	–	Oral Negative Communication
	16	ACCUSN	–	Accusations
	17	PROTST	–	Protests
	18	MINTHM	–	Minor Themes
unofficial violence	19	UNOFVL	–	Unofficial Violence
	20	ATKEMB	–	Attacks on Embassy
	21	ATKPER	–	Attacks on Persons
	22	ATKFLG	–	Attacks on Flag
non-violent demonstrations	23	NVIOLB	–	Non-Violent Behavior

*Primary Code sheet categories are seperated by solid lines. Variables 1-19 are Official Acts; Variables 20-23 are Unofficial Acts.

does not provide accurate frequency counts of conflict between any two nations, but in fact, understates them in most cases. Thus, the number of warnings and defense acts between Israel and Jordan may not reflect the actual quantity in a given month. However, there is evidence that the source presents an accurate pattern of occurrences for each variable over the dyads in this study. The correlation coefficient which will be the initial measure of similarity employed in this research, measures the pattern similarity of values for two conflict variables and not the magnitude similarity. Thus, if two variables measuring conflict behavior have the same pattern, they will be perfectly correlated. Figure 2 depicts this relationship.

A second problem raised is that any newspaper, no matter how large, is confronted with the problems of editorial decisions and national biases. It is argued that a data source using several newspapers would minimize this bias. McClelland *et al.* (1965) employed newspapers from five different countries. In his study of the Taiwan Straits conflict he found the same pattern of conflict represented in the five newspapers as were found by Sullivan (1964) in his study employing only the New York Times Index. In another investigation, Gamson and Modigliani (1965) studied the reliability of the New York Times reporting of the U.S.-Soviet behavior. They found in the comparison of nine different papers that the New York Times correlated highly with the patterns of conflict reported and the quantity of reports was much higher in the New York Times than any other newspaper.

The New York Times is a source of readily available data in international relations. Its use in gaining a good deal of investigation. Smith (1967) attempted to ascertain whether the New York Times was as good as other, non-newspaper, sources. He compared the New York Times with the Indian White Paper on the Sino-Indian border crisis and found that when one uses correlational procedures, the New York Times is an accurate representation of the

pattern coefficients
measure the agreement
of the shape of the
two curves

Cases
(rows of the data matrix)

FIGURE II. PATTERN COEFFICIENT

patterning of conflict behavior. The availability of records from the foreign offices of various nations is not sufficient to make further tests of these assumptions feasible at this time. No doubt, more effort must be expended in this task, but the above seems to lend support to the choice of the New York Times as a single source of data, at least at this stage of analysis.

2.2 The Conflict Environment of Nations: Conflict Received

In order to ascertain the basic patterns of conflict that form the environment of nations, a factor analysis was performed on a matrix of 23 conflict variables over 73 nation objects. Each observation recorded all behavior which was directed at that nation as an object. All nations that were the object of conflict acts in 1963 were employed in this analysis.[5]

The variables in this study were intercorrelated using the product moment coefficient and factor analyzed.[6] The technique employed was principal component analysis as the specific variance is important in the description of conflict behavior. In addition, I plan to employ the factor scores derived from the factors of conflict reception and the component model will allow better estimates of the true factor scores than would common factor analysis (Rummel, 1970).

The first matrix, which will be derived by factoring the correlation matrix, is a principal axis factor loading matrix. The matrix represents all of the variables in the rows, and the columns represent each factor. A principal axis solution arranges its factors in descending order of variance explained. The first factor in this solution attempts to account for the largest pattern of interrelationships among the conflict measures. The second factor delineates the next largest pattern that is uncorrelated with the first

---

[5]It may be argued that the conflict environment of nations is larger than just those actions directed at them. The decision here was used as an operationally convenient starting point.

[6]No transformations were performed on the data variables.

pattern and so on until all the variance is accounted for in the data.

Table III displays the unrotated (principal axis) matrix of environmental conflict. The first four factors account for 76.9% of the total variance of the original matrix. There is neither a general factor nor a series of bipolar factors commonly found in principal axis solutions. That there was no common factor on which all variables loaded highly is indicative of the lack of a general conflict environment pattern describing the conflict environment of nations. The lack of a bipolar factor indicates that there is no inverse relationship between sets of variables such that nations experiencing an above average amount of conflict on one variable are not generally experiencing a below average amount on another variable.

Principal component analysis generally produces as many factors as there are variables in the original matrix. While this is generally true there seems to be a clear rationale for limiting our discussion to the first four factors. There were six factors with eigenvalues greater than 1.00, but factors 5 and 6 were not easily named and represented collections of variables already loading on factors one through four. There were no loadings above .50 on these two factors and the addition in variance accounted for--about 10 percent--did not seem to warrant the lack of high loading variables which would have facilitated substantive naming.[7]

When the dimensions are rotated to a more invariant solution, it is more convenient to discuss the substantive labeling of the factors. While the un-rotated factors define the most general factors in descending order of general-ity, the rotated factors delineate distinct clusters of interrelationships when they exist in the data. Orthogonal rotation defines patterns which are uncor-

[7]For a discussion of the choice of the number of factors see Rummel (1970). I rotated four, five, and six factor solutions before choosing four.

TABLE III

FACTOR ANALYSIS OF ENVIRONMENTAL CONFLICT[a]/

Measures		Unrotated Matrix[b]/			
		F1	F2	F3	F4
1	WARNDF	27	09	75	-51
2	ALRTMB	26	06	75	-51
3	PLNVIL	31	91	04	05
4	WARACT	27	94	04	06
5	DISCMA	11	95	-02	18
6	DAYVIL	07	91	-04	20
7	NEGACT	56	-20	59	48
8	UNCNEG	63	-17	34	11
9	SEVDPR	11	-12	55	29
10	EXPREC	52	-19	-09	43
11	BCOTEM	09	-19	41	52
12	AIDREB	14	26	35	11
13	WRTCON	97	-07	-13	06
14	ORLCOM	86	-12	-16	25
15	WRTORL	97	02	-13	-04
16	ACCUSN	96	-05	-18	02
17	PROTST	78	-19	-03	35
18	MINTHM	85	-02	05	-06
19	UNOFVL	91	-03	-17	-26
20	ATKEMB	47	07	22	-09
21	ATKPER	90	-04	-22	-23
22	ATKFLG	90	-06	-26	-21
23	NVIOLB	86	00	-05	-29
% of Total Variance		47.74	16.30	10.88	7.97

[a]/ Decimals omitted from loadings.

[b]/ Principal axes technique.

related with each other.[8] These patterns identify clusters of variables which exhibit similar behavior for dyads for 1963. The rotation technique employed in orthogonal rotation was the varimax method as described in Harman (1967, p. 304). Table IV presents the varimax loading matrix.

The first orthogonally rotated factor appears to be a combination of negative communications and unofficial acts of violence. Thus, nations receiving a good deal of negative communications--accusations, protests, etc.--are also likely to be experiencing unofficial violence from other nations. Unofficial violence refers to attacks by civilian populations of one nation against the embassy, flag, or representatives of another nation. It is important to reiterate that these conflict acts need not be directed at the object nation by one specific nation but by a number of sources. Thus the United States--a high scorer on this pattern--may have received negative communication mainly from the Soviet Union and China but received the unofficial acts of violence from Latin American nations. For the purpose of this study neither the time sequencing of actions nor the sender of conflict acts is pertinent. This is a static look at the conflict environment.

The second factor indexes military conflict. This pattern of conflict behavior seems to be statistically independent of other forms of conflict experience. The third pattern of conflict experience represents warning and defensive actions received by specific object nations. The fourth factor accounts for negative sanctions such as the severence of diplomatic relations and the expulsion of diplomats.

Substantively, the statistical independence of these four patterns means that there are four separate types of conflict experience. Foreign offices generally can be expected to experience four types of conflict in the

---

[8]The factor scores will be uncorrelated, but not necessarily the factor loading vectors.

TABLE IV

CONFLICT ENVIRONMENT PATTERNS

	Measures	h^2	Varimax Rotation[a]			
			F1	F2	F3	F4
1	WARNDF	90	11	05	93	14
2	ALRTMB	90	11	02	93	15
3	PLNVIL	94	19	94	11	-05
4	WARACT	96	14	96	11	-06
5	DISCMA	94	-01	97	-04	-04
6	DAYVIL	88	-03	93	-07	-04
7	NEGACT	93	37	-05	19	87
8	UNCNEG	56	53	-05	26	45
9	SEVDPR	41	-04	-03	23	60
10	EXPREC	50	51	04	-29	39
11	BCOTEM	49	-04	-06	-04	69
12	AIDREB	22	02	30	23	28
13	WRTCOM	96	96	07	-01	18
14	ORLCOM	84	86	04	-17	27
15	WRTORL	95	96	14	07	08
16	ACCUSN	97	97	08	-02	10
17	PROTST	76	74	-02	-16	43
18	MINTHM	72	81	08	19	16
19	UNOFVL	92	94	04	17	-10
20	ATKEMB	28	40	12	30	15
21	ATKPER	91	94	03	11	-12
22	ATKFLG	92	95	01	07	-12
23	NVIOLB	83	86	06	27	-07
	% of Total Variance		39.39	16.44	10.27	10.79

[a] Decimals omitted from loadings.

international system, but the relationship between these patterns is unpredict-
able at the systemic level.[9]

III. Patterns of National Output

Oliva and Rummel (1969) analyzed the bynation conflict of 107 nations
for 1963. This was an analysis of the conflict behavior nations have initiated.
The result of their study along with those just reported comprise the conflict
output and input of nations, respectively. In a factor analysis of the nation-
al output, Oliva and Rummel found five conflict patterns. In a reanalysis of
their data, I found the same five factors found in the earlier analysis.[10]
The factors from my reanalysis are presented in Table V. The patterns were
termed Negative Communication, Official Violence, Unofficial Violence, Negative
Sanctions, and Warning and Defensive Acts, respectively. This five factor
solution points out an immediate difference between national input and output
patterns of conflict. In the actions from the nation to the environment,
patterns of Negative Communications and Unofficial Acts of Violence are dif-
ferentiated while in the analysis of environmental input to nations, these
behaviors are not differentiated.[11] Substantially, the patterns of the con-
flict nations sent in 1963 were slightly more complex than the patterns of
conflict received. While the patterns of conflict sent are slightly more com-
plex than the conflict experienced from the international environment, it is
the similarity which is much more striking.

---

[9]The findings do not apply to specific nations but to the system in
general. Thus, a subsection of the system may experience jointly several of
these patterns of conflict. For an attempt to compare parameters at both
levels see Rummel (1969).

[10]I felt it was desirable to refactor the Oliva-Rummel analysis because
three key communications variables (written, oral, and written or oral communi-
cations were omitted from the earlier study and because the number of nations
in their study was 107.

[11]This raises the question of the number of factors. When I rotated
five factors, I found the same difference. Therefore, it can be assumed that
the differences are not simply due to the four factor solution for conflict
received.

TABLE V

	Measures	h^2	Varimax Rotations[a]				
			F1	F2	F3	F4	F5
1	WARNDF	92	14	03	11	03	-94
2	ALRTMB	88	15	01	08	05	-92
3	PLNVIL	93	11	95	-01	-01	-12
4	WARACT	95	08	97	00	-03	-17
5	DISCMA	95	-04	97	-02	01	05
6	DAYVIL	87	02	93	-04	-03	07
7	NEGACT	97	21	-02	08	92	-27
8	UNCNEG	80	18	-01	-04	84	-25
9	SEVDPR	39	-11	-10	38	32	-35
10	EXPREC	41	11	-02	03	62	10
11	BCOTEM	50	04	-05	-16	68	-11
12	AIDREB	45	33	26	30	42	09
13	NEGCOM	98	96	04	-02	23	-08
14	WRTCOM	89	93	04	-03	11	05
15	ORLCOM	77	86	03	07	15	05
16	ACCUSN	91	95	05	-04	-10	00
17	PROTST	86	72	-01	-07	56	-13
18	MINTHM	74	76	04	-04	18	-34
19	UNCFVL	96	-01	-03	97	-01	-12
20	ATKEMB	35	05	02	52	11	-26
21	ATKPER	83	-06	-02	91	-02	04
22	ATKFLG	85	-02	-03	92	03	04
23	NVIOLB	49	-00	07	05	31	-62
% of Total Variance			20.91	16.23	13.83	14.09	11.59

[a] Decimals omitted from loadings.

IV. The Comparison of Conflict and Responses.

The conflict experiences of nations for 1963 can be analyzed by comparing conflict actions sent with actions received. The factor score matrices derived from the analysis of environmental conflict in section 3 will be compared with the factor score matrix calculated in the re-analysis of bynation conflict reported in section 4.[12] To compare them, I have chosen the canonical model in which linear combinations of conflict received by nations are related to linear combinations of national conflict actions. Such combinations would take the form:

$$\alpha_{11}E_1 + \alpha_{12}E_2 + \cdots \alpha_{1m}E_m = \beta_{11}A_1 + \beta_{12}A_2 + \cdots + \beta_{1n}A_n + e_1 \quad (1)$$

where α= coefficients for environmental conflict, E = conflict received by nations from the environment, β= coefficients for natural actions, A = conflict sent to the environment.

This is the basic algebraic model of canonical analysis. Canonical analysis attempts to maximize the linear correlation between pairs of Variates.[13] Each Variate is independent of the other Variates on its own side of the equation and all Variates on the other side of the equation with the exception of those on the same row, opposite itself.

By summing the standardized raw data--in this case the factor scores of both the original analysis--times the correct canonical weights, a Variate score for each nation on the linear combination of both input and output can be derived.

---

[12]Factor scores are calculated by the formula
$$S_{nxp} = Z_{nxm} \, F_{mxp} \, (F'F)^{-1}_{pxp}$$

where S is the factor scores, Z is the standardized raw data, and F is the matrix of loading weights.

[13]I have capitalized "Variate" throughout this paper to help the reader distinguish between Variable--a vector of observations--and Variate--a linear combination of variables weighted by canonical coefficients.

$$V_{nxq} = E_{nxq} \, A_{nxq} \qquad (2)$$

$$W_{nxq} = B_{nxp} \, B_{pxq}$$

where V_{nxq} = the matrix of canonical Variate for tha conflict received and

W_{nxq} = the matrix of canonical Variates for tha conflict sent. These Canonical Variates ara vactors of scores for each nation on the Variate. By subtracting the Conflict Sent score of a nation from its Conflict Receivad score, the degraa of similarity between them is ascertained.

$$V_1 - W_1 = R_1 \qquad (3)$$

where V_1 is the first Canonical Variate of Conflict Received,

W_1 is the first Canonical Variate of Conflict Sant, and

R_1 is the rasidual vector for $V_1 - W_1$.

The standard daviation of R_1 provides a bench-mark for signaling when a differ-ence between V_{ij} and W_{ij} is extreme. When such a rasidual is more than one standard deviation from the mean of the residual vector, the amount of conflict sent or received by that nation is abnormal, relative to other nations' input-output relationships.

This canonical model was applied to tha matrices of factor scores of nations conflict actions sent and raceived. The numbar of nations which re-ceived conflict was 73, the number that sant conflict was 82, and the number that received and sent conflict was 65. I factored two matrices; a conflict sent matrix with 83 observations and a conflict received matrix with 73 observ-ations. In employing the canonical analysis I usad all 73 nations which re-ceived conflict. When a nation receiving conflict did not send conflict, scores for zero conflict were insartad for that observation. The choice of sample is a function of this author's intarest in nations' rasponsas to conflict

received from the environment.

The first matrix to be presented in this analysis is the canonical coefficient matrix, seen in Table VI. There is a separate set of canonical Variates for each matrix. Thus, Variate 1 from the Environmental Conflict matrix is maximally related to Variate 1 of the Conflict Behavior matrix. Another statistic should be presented at this time, the canonical correlation. It is the correlation between V_i and W_j when $i = j$. It measures the degree of pattern similarity for nations on the corresponding Variates of conflict sent and received.[14] The correlations between V_i and W_j when i does not equal j, are all 0. Turning to the communality estimates (H-SQR), they record the percent of variance from each variable that is accounted for by the Variates. In other words,

$$H^2_i = \sum_{i=j}^{p} r^2_{ij} \tag{4}$$

where H^2_i is the communality estimate of variable, and r is the correlation of the variable with the Variate.[15] All of the variance in the matrix of factor scores for conflict received is accounted for in the analysis, thus all communalities are 1.00. Since this is the smaller of the two matrices, all of its variance will be accounted for and there will be as many Variates as there are independent column vectors in this matrix.

As opposed to communalities of 1.00 for conflict received, the variance of the conflict sent variables can vary considerably. In this case, four of the five variables of conflict sent by nations are highly related to variables

---

[14]The correlation is the square root of the eigenvalue.

[15]Caution is needed in interpreting this table. The communality estimate is not the sum of the coefficients reported but requires the calculation of correlations between the Variates defined by these coefficients and raw data. I have attempted to combine the results into a single table.

TABLE VI

CANONICAL VARIATES FOR COMPARISON BETWEEN CONFLICT SENT AND CONFLICT RECEIVED

Conflict Sent	h^2	Canonical Variates 1	2	3	4
1 Negative Communications	.97	.03	.67	.72	.06
2 Official Acts of Violence	1.00	1.00	-.04	.03	-.02
3 Unofficial Acts of Violence	.12	-.04	-.02	-.15	-.31
4 Negative Sanctions	1.00	.06	.69	-.67	.27
5 Saber Rattling	.91	-.04	-.29	.09	.91
Canonical Correlations		.98	.94	.74	.35

Conflict Received	h^2	1	2	3	4
1 Negative Communications/ Unofficial Acts of Violence	1.00	.07	.94	-.30	-.13
2 Official Acts of Violence	1.00	1.00	-.05	.06	-.04
3 Saber Rattling	1.00	.07	.01	-.39	.92
4 Negative Sanctions	1.00	-.00	.34	.87	.37

of conflict received by nations since their communalities show more than ninety percent of their variance is being accounted for in this analysis. In contrast, unofficial violence sent to the environment is not related to the relationships delineated here. Thus, it would appear that mass demonstrations, attack on embassies and other acts of unofficial protest are not related to experience with conflict received from the environment.

Turning from the communalities to the Variates themselves, I will discuss only coefficients above .50. The first combination of Variates has a correlation of .98. Taking the high loading variables from Table VI , and rearranging them to conform to the format as laid out in equation (1), we have the following equation:

Official Violence sent $\doteq$ Official Violence Received

The sign $\doteq$ is used in these equations to mean approximately equal, since I have included only variables which strongly contribute to the Variates. Some variables such as clashes are considered symmetric in character and automatically coded for both sides. While there is no conceptual difference between coding a clash on both sent and received and coding both a threat sent and a threat received, the reader should understand that it is in the nature of military conflict that sides fired upon tend to return that fire.

As a supplement to this interpretation of canonical coefficients, the scores of each nation on the Variates can be computed. These scores represent a weighted combination of each nation's conflict sent and received. The weights are the canonical coefficients. By subtracting a nation's score on the Variate of conflict sent from its score on the conflict received Variate, the residuals are delineated. Table VII presents those scores on the first pair of Variates which showed residuals of more than one standard deviation.

TABLE VII

VARIATE 1

Nation	Conflict Received Score	Conflict Sent Score	Residual Score
Albania	5.28	4.89	0.38*
Cambodia	0.10	-0.26	0.36*
China	0.31	-0.05	0.36*
Taiwan	0.17	-0.13	0.30*
Egypt	0.37	0.83	-0.46**
Haiti	-0.01	-0.34	0.33*
Indonesia	0.40	0.88	-0.48**
Iran	-0.15	-0.42	0.27*
Iraq	-0.35	-0.14	-0.22*
Jordan	0.24	0.46	-0.22*
North Korea	-0.01	0.50	-0.51**
Malasia	0.67	0.41	0.25*
Saudi Arabia	0.59	0.11	0.49**
Somalia	0.07	-0.18	0.24*
Syria	1.07	0.64	0.42*
Union of South Africa	-0.18	-0.42	0.24*
USSR	-0.28	0.11	-0.39*
North Viet Nam	-0.40	-0.18	-0.22*
South Viet Nam	-0.40	0.11	-0.51**
Yugoslavia	4.89	5.31	-0.42*

* = one standard deviation

** = two standard deviations from the mean residual.

With the exception of Saudi Arabia, the nations which display irregularities
in excess of two standard deviations in conflict exchange with their environ-
ment on this pair of Variates were sending more violent conflict to the en-
vironment than they received.[16]

Continuing with the second set of Variates, the following equation is
applicable:

.67 Negative Communications + .69 Negative Sanctions Sent $\doteq$ .94 Negative

Communications/Unofficial Violence Received.

The correlations between these Variate scores is .94. Thus, nations sending
both Negative Communications and Negative Sanctions received Negative Commun-
ications or Unofficial Violence. The residuals of Table VIII present the
nations with extreme residuals in this relationship. Those nations with
extreme residuals are all sending much more to the environment than would
be expected given that which they received.

In contrast to the nations sending both Negative Communications and
Sanctions delineated above, the third pairing of Variates highlights nations
which send Negative Communications, but not Negative Sanctions.

.72 Negative Communications - .67 Negative Sanctions $\doteq$ 87 Negative Sanctions.

This relationship can be interpreted as those nations receiving Negative Sanc-
tions from the environment respond   with Negative Communications but not
Negative Sanctions. These two sets of Variate pairs (sets 2 and 3) point out
the diplomatic complexity of Negative Communications and Negative Sanctions.
These two forms of behavior would appear to be the normal day to day processes

---

[16]The usual procedure here would be to interpret why these irregulari-
ties occur. I will not do this at this stage since I will explai r these
deviations in section V.

TABLE VIII

VARIATE 2

Nation	Conflict Received Score	Conflict Sent Score	Residual Score
Albania	-0.85	-0.39	-0.46*
Cambodia	-0.20	0.36	-0.56*
Egypt	0.06	0.49	-0.43*
Ethiopia	-0.18	0.23	-0.41*
France	0.77	0.22	0.54*
India	0.35	1.51	-1.16**
Iraq	-0.15	0.60	-0.75**
Malaysia	-0.22	0.53	-0.76**
Morocco	-0.20	0.16	-0.37*
Portugal	0.17	-0.45	0.62*
Senegal	-0.41	-0.03	-0.39*
Syria	0.17	-0.52	0.68*
United Kingdom	1.36	1.87	-0.51*
Union of South Africa	0.43	-0.15	0.58*
USA	6.52	5.87	0.65*
South Viet Nam	0.14	-0.45	0.60*
Yugoslavia	-0.55	-1.04	0.49*

* = one standard deviation

** = two standard deviations from the mean residual.

of expressing diplomatic displeasure. There appear to be two patterns; one set of nations engages in both types of acts while another group usually chooses one but not the other.[17] I have been interpreting the input-output relationships of conflict as though a nation sent and then received conflict. This sequencing is not necessarily correct. In fact, it may just as easily be that nations first receive Negative Sanctions and then, complain about it. Since there is no theoretical reason for placing first, the nations' actions or the conflict received, canonical analysis is ideal because the relationships are symmetric and do not change with the direction of assumed sequencing.

Table IX lists the nations with irregular exchanges with their environment. Now for the first time nations with unexpected relations with their environment received more than they sent. The correlation between the Variate in this case was .74 or approximately 54 percent of the variance in Variate scores is held in common.

The final relationship only accounts for about 12 percent--or a correlation of .35--of the variation in exchanges with the environment.

-31 Unofficial Violence + 91 Warning and Defensive Acts ≟ 92 Warning

and Defensive Acts + 37 Negative Sanctions

In other words, nations which rattle sabers are quite likely to receive this in return as well as Negative Sanctions such as expulsions of diplomats. Since this relationship is not strong, it does not warrant extensive interpretation.

The preceding discussion has concentrated on specifying combinations of variables. There is yet a final set of relationships that should be discussed, however. It would be convenient to have a measure of the overall

---

[17]Whether or not a nation chooses to employ both types of acts in a single conflict relation with a specific opponent is not answerable in this analysis because the objects of conflict are not differentiated.

TABLE IX

VARIATE 3

Nation	Conflict Received Score	Conflict Sent Score	Residual Score
Brazil	-1.05	0.05	-1.10*
Cambodia	-0.00	-0.79	0.79*
China	1.51	4.30	-2.79**
Congo	0.03	-0.72	0.76*
Cuba	3.64	2.61	1.03*
Dominican Republic	1.71	0.92	0.79*
France	2.40	0.10	2.30**
Indonesia	-1.38	-0.62	-0.76*
Israel	-0.42	0.50	-0.93*
Lebanon	-0.29	0.42	-0.72*
Morocco	0.13	-1.15	1.28*
Netherlands	-0.05	-0.79	0.75*
Portugal	1.28	0.37	0.91*
Union of South Africa	2.41	0.87	1.54**
Venezuela	-0.56	-1.42	0.86*

* = one standard deviation

**= two standard deviations from the mean residual.

TABLE X

VARIATE 4

Nation	Conflict Received Score	Conflict Sent Score	Residual Score
Cuba	1.78	0.36	1.42*
Dominican Republic	-0.26	4.14	-4.40**
Haiti	4.89	-0.90	5.78**
Israel	1.79	0.15	1.65*
Malaysia	1.30	4.65	-3.35**
United Kingdom	1.62	0.40	1.21*

* = one standard deviation

** = two standard deviations from the mean residual.

relationship of the two spaces and to know how much variance in each space is being accounted for by these relationships. The proportion of variance accounted for by respective sets of canonical Variates is presented in Table XI. This table provides information on the proportion of variance accounted for in the conflict sent space and in the conflict received space. All of the variance in the conflict received space is accounted for in this analysis, since it is the smaller of the two spaces. Eighty percent of the variance in nations' actions to the environment is reproduced by the Variates.

These Variates are the bases of both spaces, but a basis of a vector space is not uniquely given. It is only one set of an infinite number of bases. To ascertain the degree of relationship between the spaces, Hooper derived a Trace Correlation (1959) which is the average of all canonical correlations.

$$\text{Trace} = \bar{r} = \sqrt{1/p \sum_{j=1}^{p} r^2_j}$$

where p = the number of variables in the right hand matrix, Y and r_j is the jth canonical correlation between Variates V_j and W_j. It is an estimate of the average correlation between Variates for any set of basic vectors derivable in dimensionalizing the two spaces. The trace correlation in this analysis is .79 or better than 60 percent of the variance in nations' Conflict Actions is related to the conflict it receives from the environment.

V. Characteristics of Nations Displaying Residuals in their Conflict Sent and Received Scores.

Recall again that for each set of canonical Variates interpreted above, it was possible to calculate a nation score for conflict sent and conflict received, and by subtracting these estimates of conflict sent from that received,

TABLE XI

Variate	Canonical Correlation	Proportion of Left Hand Variance	Proportion of Right Hand Variance
1	0.97670	19.98	24.95
2	0.93935	19.69	24.85
3	0.74098	20.30	25.30
4	0.35118	19.97	24.91
		79.94	100.00

a residual score was calculated. The question to be answered now is: What are the characteristics of nations which account for the residuals? The DON project has factor analyzed 190 attribute variables for 107 nations in 1963. Twenty-two factors accounted for 78 percent of the variance.[18] Table XII lists a marker variable for each of the factors.[19] These twenty-two variables were then employed in an attempt to account for the residuals in conflict sent and received. The procedure employed was stepwise regression.[20] The theoretical approach taken here is to assume that conflict begets conflict and that deviation from the normal exchanges with a nation's environment can be explained by resorting to specific attribute characteristics of these nations.

It is particularly important to discuss the problem of random error when dealing with residuals of highly correlated variables. Most of the random error of the two variables is skimmed off in the residuals. Regression capitalizes on random error. Thus, for twenty-two independent variables, each variable will necessarily (practically speaking) increase the percent of variance explained, even if they were twenty-two error variables. The problem is then, when dealing with a dependent variable highly inflicted with random error (because it is a residual variable) and using a technique that capitalizes on random error, how much faith can we put in the results? To answer this question, the t-test for each variable and the F-ration for the overall relationship is reported. Both tests are employed as answers to the random error problem and do not represent a sampling perspective in this paper.

---

[18]The technique employed in this analysis was component factor analysis and varimax rotation with a 1.0 eigenvalue cutoff criteria. Missing data estimation was employed to fill in all missing cells, using a technique described in Wall and Rummel (1969).

[19]A marker variable is one which is highly correlated with the factor scores. It is used rather than factor scores for ease in interpretation.

[20]For a discussion of this technique see Draper and Smith (1966).

TABLE XII

MARKER VARIABLES FOR THE PATTERNS OF NATIONAL ATTRIBUTES

Pattern No.	Marker Variables
1	Agricultural Population/populations
2	Population
3	Defense Expenditure
4	IFC and IBRD subscriptions/$(GNP)^2$ per capita
5	Domestic Killed
6	Purges
7	Population/national land area (density)
8	Foreign college students/college students
9	Religious titles published/book titles
10	Unemployed/economically active population (% unemployed)
11	Languages
12	Need affiliation scores
13	Export GNP
14	Cost of living index
15	Military personnel/population
16	Balance of investments/gold stock
17	Arts and cultural NGO/Ngo
18	Legality of Government Change
19	UN delinquencies/assessment
20	Constitutional Status 0=totalitarian, 1=authoritarian, 2=constitutional
21	Factor Scores on South African Voting Dimensions
22	Latitude measure of nation's capital

The results of the first regression analysis of the deviations from the expected of military violenca sent and received are presented in Table XIII. Seven of the twenty-two attribute characteristics account for 36 percent of the variance in the residuals. The two most important variables are Domestic Killed and the Percentage of Population in Agriculture. These two variables are inversely related to the deviation in scores for military exchanges. Positive deviations indicata the receipt of more official military conflict than expected, given the amount sent to the environment. Thus, attributa variables with positive coafficients vary directly with more conflict received than expected, given the conflict sent while attribute variables with negative coefficients vary directly with unexpected levels of conflict sent. The conclusion hare is that nations displaying domestic violence, having a low percentage of population in agriculture, who have tended to experience unlawful change of offices in the recent past, and have a high cost of living index, tend to send more military violance to tha environment than would ba expected, givan normal exchange with the environment. In other words, modernized nations experiencing inflation and internal violence, possibly associated with tha unlawful exchange of leadership, are likely to over respond militarily to thair environment. The finding supports much of the literature regarding the relationship between internal and external violence.[21] It is interesting in light of the general lack of relationship between internal and external violence uncovered in empirical studies (Rummel, 1963; Tanter, 1966; Phillips and Hall, 1970). It suggests that most military violence is directly related to the receipt of violence (the Correlation above is .97) but that deviations or perhaps oversensitivity to military violence is found among those nations experiencing internal violence and rising costs of living.

The second variable of conflict residuals was taken from the relation-

---

[21]For example, see Rosecrance (1963).

TABLE XIII

OFFICIAL MILITARY VIOLENCE RECEIVED - OFFICIAL MILITARY VIOLENCE SENT
REGRESSED ON NATIONAL ATTRIBUTES

Variable	Multiple		Increase		Relation-
	R	RSQ	in RSQ	T Test	ship
Domestic Killed	19	8	8	9.86	-
Agriculture Population/population	40	16	8	9.84	
Legality of Government Change	47	22	6	6.04	
Cost of Living Index	51	26	4	4.68	-
Religious Titles Published/ book titles	55	30	4	5.18	
Latitude Measure of Nation's Capital	57	33	3	2.88	-
Unemployed/Economically active population (% unemployed)	60	36	3	2.58	

Constant = .43
F ratio = 4.58

ship between Negative Communications and Negative Sanctions sent and received.
It varied positively with more than expected amounts of Negative Communications
and Negative Sanctions sent. Population is the marker variable for a factor
which also has a high loading for Riots indicating that nations with large,
highly dense populations (as shown by another marker variable) tend to show
population unrest in the form of riots but not domestic killed. This combina-
tion explains international conflict in the form of Negative Sanctions and
Negative Communications. These nations are also economically developed as
shown by results of their energy production divided by gross national product
and their lack of unemployment. There are two substantial differences between
this set of national characteristics and the ones found to account for devia-
tions in military violence. First, nations over acting along the military
violence Variates were nonagricultural, with high living cost, low unemploy-
ment but they were not delineated by population or economic development. The
second difference seems to be the role of violence in these two sets of
societies. In the first relationship, Domestic Killed was positively related
to overestimates of a nation's actions. In this second relationship it is
negatively related to excess in predicting actions of nations. The percent
of variance explained was 55 percent.

Turning to the analysis of deviations from the third pair of Variates,
the canonical coefficients accounted for Negative Communications or Negative
Sanctions sent from nations to their environment, but not both. Ten attribute
characteristics combine to predict almost 50 percent of the residual variance
in this relationship. Since sending Negative Communications and receiving
Negative Sanctions is the strongest relation, it will be the basis of this
discussion. The variables most influential in explaining the release of more
Negative Communications than expected were population, percent unemployed,
military personnel as a percentage of population and voting on South African
issues in the UN. Countries with large residuals tend to have large popula-

tions but a relatively high level of employment. They also have a relatively large percentage of their population in the military, but do not spend a large portion of their budget on defense expenditures, and show an interest in religion as indicated by the importance of religious titles published. These characteristics vary positively with deviations in the amount of Negative Communications sent from nations to the environment. In contrast to the influence of economic development on nations which tend to over respond in both Negative Sanctions and Negative Communications, nations which are over active on only one or the other are not developed, usually large, and traditionally oriented. These findings suggest that nations which tend to be economically developed demonstrated a tendency to handle several patterns of conflict at a time and tend to show larger than normal activity, given environmental inputs, in the diplomatic forms of conflict, Negative Sanctions, and Negative Communications. On the other hand, nations which are large but not economically developed and suffer from internal stress are likely to demonstrate this tension by overaction in only one pattern of diplomatic conflict, Negative Sanctions, or Negative Communications.

The final canonical Variate accounted for Warning and Defensive Acts sent and received. This saber rattling was not highly correlated as shown by the correlation between input and output of .35. Thus, there was a good deal of variation in the residuals, but the ability for attributes to predict this deviation was not as large or as interpretable as the other regression analyses. While these four variables shown in Table XVI account for 31 percent of the variance in deviations from input-output correlation, there does not seem to be a readily interpreted relationship.

TABLE XIV

NEGATIVE COMMUNICATIONS AND NEGATIVE SANCTIONS RECEIVED - NEGATIVE COMMUNICATIONS AND NEGATIVE SANCTIONS SENT REGRESSED UPON NATIONAL ATTRIBUTES

Variable	Multiple R	RSQ	Increase in RSQ	T Test	Sign
Export GNP	35	12	12	3.91	-
Population	46	22	9	12.57	-
Unemployed/Economically Active Population (% Unemployed)	56	31	10	9.62	
Factor Scores on South African Voting Dimensions	61	37	6	5.58	-
Balance of Investments/Gold Stock	64	41	4	9.19	
Foreign College Students/College Students	66	44	3	2.89	-
Population/National Land Area (density)	69	47	3	6.88	-
Domestic Killed	70	49	2	3.44	
Legality of Government Change	72	52	2	4.13	
Arts and Cultural NGO/NGO	74	55	3	3.47	

Constant = -.14

F ratio = 6.52

TABLE XV

NEGATIVE COMMUNICATIONS OR NEGATIVE SANCTIONS RECEIVED - NEGATIVE COMMUNICATIONS OR NEGATIVE SANCTIONS SENT

REGRESSED UPON NATIONAL ATTRIBUTES

Variable	Multiple R	RSQ	Increase in RSQ	T Test	Sign
Population	38	14	14	20.26	-
Factor Scores on South.African Voting Dimensions	49	24	10	6.72	-
Unemployed/Economically active Population (% Unemployed)	52	28	4	8.95	-
Religious Titles Published/Book Titles	57	32	4	4.89	-
Military Personnel/Population	61	37	5	7.94	-
Cost of Living Index	63	39	3	1.34	-
Constitutional Status 0=totalitarian, 1 = authoritarian, 2=constitutional	65	42	3	1.02	
Languages	66	44	2	4.04	
Population/National Land Area (density)	68	46	3	3.77	
Defense Expenditure	70	49	3	2.87	

Constant = .40

F Ratio = 5.18**

TABLE XVI

WARNING AND DEFENSIVE ACTS RECEIVED - WARNING AND DEFENSIVE ACTS SENT
REGRESSED ON NATIONAL ATTRIBUTES

Variable	Multiple R	RSQ	Increase in RSQ	T Test	Sign
Arta and Cultural NGO/NGO	31	10	10	10.83	
Religious Titles Published/Book Titles	45	20	10	9.28	
Balance of Investments/Gold Stock	51	26	6	6.67	
Languages	55	31	4	3.63	

Constant = -1.51

F Ratio = 6.59

Conclusions

Three levels of analysis have been employed in a first pass at the conflict input-output of nations. Factor analysis was used to find the independent patterns of conflict sent and received across nations for 1963. Then, canonical analysis ascertained the degree of relationship between input and output. And finally, stepwise regression techniques were employed to discover the attributes of nations which were related to deviations in input-output patterns of conflict. The individual results have been presented previously, but by bringing these results together we can make some statements about the nature of the conflict system. The five patterns of behavior found in analyzing conflict sent to the environment can be broken down into three subgroups. The patterns of Official Military Violence and Warning and Defensive Acts can be combined as the domain of the military. These are the behaviors which result from decisions of the executive and defense department. Of course, diplomatic experts and representatives from foreign offices are consulted, but the responsibility for the actions rests with the military. On the other hand, Negative Sanctions and Negative Communications usually orginate in the diplomatic offices of the government. This classification of patterns of behavior leaves just Unofficial Acts of Violence. These acts would orginate in the mass public or among subgroups of that public.

The findings suggest a relationship between diplomatic and military acts of conflict: military initiative on the part of a specific nation is met with a military response from the environment. Thus, violence begets violence and saber rattling is the response to saber rattling. The diplomatic initiatives are responded to by diplomatic activities but in this case the actions are somewhat more complex. One strategy seems to be the use of both Negative Sanctions and Negative Communications while another appears to be the use of one or the other but not both.

Unofficial Violence is not a separate pattern of environmental conflict, suggesting that across nations in 1963 there was not a subset of nations which received this form of conflict as the sole pattern of conflict. In the canonical analysis, the low communality of the nation output factor for unofficial violence signaled that the type of behavior was not related to conflict changes.

The above findings specify a direct relationship between that which a nation sends to and receives from the international environment. Nations which send conflict to the environment can expect to receive conflict from it. The relationship of conflict behavior sent and received is quite high. It would also appear that at the macro level, diplomatic responses to diplomatic conflict are more probable than escalations from diplomatic to military conflict. The next step in this form of analysis would be to move to overtime analyses to ascertain the life cycle of conflicts.

The attempt at predicting deviations from expected in conflict sent and received highlighted the role of internal unrest in explaining these residuals. Residuals in each of the three largest relationships between input and output all pointed to the role of internal stress. Actual domestic violence resulting in domestic deaths was related to over expected initiatives of Military Violence. Other forms of domestic unrest and internal stress such as riots, high amounts of unemployment, or high cost of living indices were important in accounting for higher than estimated amounts of diplomatic conflict. It would appear that the number of different diplomatic conflict behaviors a nation jointly sends out is explainable by its technical ability to handle complex forms of behavior. These findings relate to a number of current theoretical statements. The linkage between domestic aspects of national units and international policies is viewed here as secondary to the actual give and take with the environment. I have taken Rosenau's admonition to look for

linkages (1969) in particular in domestic sources of foreign policy (1968).
These findings support his excellent suggestion and demonstrate both an
operational technique for specifying the environmen: and aspects of politics
as well as an alternative approach to linking the two domains. The relation-
ships of internal conflict to external conflict found in this work is close
to the conceptualization of internal violence spilling over into international
actions as suggested by Rosecrance (1963) and others. Thus, the conflict
environment of nations would be expected to have a dynamics of its own with
deviations explainable by internal or domestic forces.

Bibliography

Azar, Edward E. "The Dimensionality of Violent Conflict: A Quantitative Analysis." Paper presented at the Conference on Middle East Conflict, sponsored by Peace Research Society (International), Cambridge, Massachusetts, June 4-5, 1970.

Boulding, Kenneth E. Conflict ano Defense: A General Theory. Harper and Row, New York, 1962.

Burton, John W. Conflict Resolution: The Use of Controlled Communication in International Relations. New York: The Free Press, 1969.

Denton, Frank H. and Warren Phillips. "Some Patterns in the History of Violence." The Journal of Conflict Resolution, Vol. XII, No. 2, June 1968, pp. 182-195.

Deutsch, K. W. The Analysis of International Relations. Englewood Cliffs, New Jersey: Prentice-Hall Inc., 1968.

Holsti, Ole; Robert C. North, and Richard A. Brody. "Perception and Action in the 1914 Crisis." Quantitative International Politics. Edited by Singer. New York: The Free Press, 1968, pp. 123-58.

Gamson, William A. and Andre Modigliani. "The New York Times as A Data Source." The Carrot and/or the Stick. July, 1965.

McClelland, Charles A.; Daniel Harrison, Wayne Martin, Warren Phillips and Robert Young. "The Communist Chinese Performance in Crisis and Non Crisis: Quantitative Studies of the Taiwan Straits Confrontation." China Lake, California: Behavioral Sciences Group Naval Ordinance Test Station, 1965.

McClelland, Charles A. Theory and The International System. New York: The MacMillan Company, 1966.

McClelland, Charles A. "Access to Berlin: The Quantity and Variety of Events, 1948-1963." Quantitative International Politics. Edited by Singer. New York: The Free Press, 1968, pp. 159-86.

McClelland, Charles A. "Two Conceptual Issues in the Quantitative Analysis of International Event Data." University of Southern California, 1970. (Mimeographed)

Moyal, J. E. "The Distribution of Wars in Time." Journal of the Royal Statistical Society, Vol. 112,(1949), pp. 446-9.

Oliva, Gary and R. J. Rummel. Foreign Conflict Patterns and Types for 1963. Dimensionality of Nations Project, Research Report No. 22, University of Hawaii, April, 1969.

Osgood, Charles. "Behavior Theory and The Social Sciences." Approaches to the Study of Politics. Edited by Roland Young. Evanston, Illinois: NorthWestern University Press, 1958.

Phillips, Warren R. "Dynamic Patterns of International Conflict." Ph.D. Dissertation, University of Hawaii, October, 1969.

Phillips, Warren R. A Mathematical Theory of Conflict Dynamics. Dimensionality of Nations Project, Research Report No. 39, University of Hawaii, June 1970.

Phillips, Warren R. and Dennis R. Hall. The Importance of Governmental Structure as a Taxonomic Scheme for Nations. Dimensionality of Nations Project, Research Report No. 18, University of Hawaii, 1970.

Rapoport, Anatol. "Mathematical, Evolutionary, and Psychological Approaches to the Study of Total Societies." The Study of Total Societies. Edited by Samuel Z. Klausner. Garden City, New York: Doubleday and Company, Inc., 1967.

Richardson, Lewis Fry. Arms and Insecurity. Homewood, Illinois: Boxwood Press, 1960.

Rosecrance, Richard. Action and Reaction in World Politics: International Systems in Perspective. Boston: Little Brown & Co., 1963.

Rosenau, James. Calculated Control as a Unifying Concept in the Study of International Politics and Foreign Policy. Center of International Studies Research Report No. 15, Princeton, New Jersey, 1963.

Rosenau, James. Domestic Forces of Foreign Policy. New York: The Free Press, 1967.

Rosenau, James N. Linkage Politics. New York: The Free Press, 1963b.

Rummel, R. J. "Dimensions of Conflict Behavior Within and Between Nations." General Systems Yearbook, Vol. VIII (1963), pp. 1-50.

Rummel, R. J. "Field Theory and Indicators of International Behavior." Paper Presented at the Annual Meeting of the American Political Science Meetings, New York, September, 1969.

Rummel, R. J. Applied Factor Analysis. Evanston, Illinois: Northwestern University Press, 1970.

Singer, J. David. "The Level of Analysis Problem in International Relations." World Politics, Vol. XIV (1961), pp. 77-92.

Singer, J. David and Melvin Small. "Alliance Aggregation and the Onset of War 1815-1945." Quantitative International Politics: Insights and Evidence. Edited by Singer. New York: The Free Press, 1968, pp. 247-86.

Smith, Raymond F. "On the Validity of Using the New York Times as a Source of Data on International Events." Northwestern University, Department of Political Science. (Mimeographed)

Smoker, Paul. "A Time Series Analysis of Sino-Indian Relations." Journal of Conflict Resolution, Vol. XIII (June, 1969), pp. 172-91.

Snyder, Richard C. Decision-Making or an Approach to the Study of International Relations. Princeton, New Jersey: Foreign Policy Analysis Project, 1954.

Sullivan, John D. "Quenoy & Matsu: A Systematic Analysis." San Francisco State, 1964. (Mimeographed)

Tanter, Raymond. "Dimensions of Conflict Behavior Within and Between Nations, 1958-60." Journal of Conflict Resolution, Vol. X, No. 1 (1966), pp. 41-64.

Wall, Charles and R. J. Rummel. Estimating Missing Data. Dimensionality of Nations Project, Research Report No. 20, University of Hawaii, January, 1969.

Whiting, Allen S. China Crosses the Yalu. Santa Monica, California: RAND Corporation R-356-PR, 1960.

Wright, Quincy. A Study of War. Chicago: University of Chicago Press, 1942.

Zinnes, Dina A. "The Expression and Perception of Hostility in Prewar Crisis: 1914." Quantitative International Politics. Edited by Singer. New York: The Free Press, 1968, pp. 85-122.