INTERNATIONAL INTERACTIONS MODELS

by

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Abstract

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The study is an attempt to evaluate the relative importance of internal vs. external explanatory variables for the different types of international interactions. Because both data and measures for many theoretically relevant internal and external explanatory variables are lacking, it was decided to use the most stable internal variables in terms of economic development and size and the most widespread external variables in terms of equivalent reciprocity with the expectation that models which include both the above-mentioned internal and external variables will be stronger explanatory devices than those which use either type of variable.

Simple and multiple regression was applied to 1965 economic and demographic data drawn from the second edition of the World Handbook of Political and Social Indicators to represent economic development and size and to interaction events data of the 1966-1969 period drawn from the World Events/Interaction Survey. There was lack of fit between the mathematical requirements of the regression model and the data

characteristics, but it was felt that such lack of fit is not serious enough to prevent the generation of theoretically meaningful results.

These results showed that a comprehensive model which includes both the internal and external variables mentioned above is, depending on the international interaction category, no better than either models explaining by internal variables alone or by external variables alone. More specifically, internal variables are the best explanation for international interaction categories representing strong cooperation or weak conflict and external variables are the best explanation for international interaction categories representing weak cooperation or strong conflict. This occurred because both strong cooperation and weak conflict are slow-changing international interactions and so also the internal variables which best explain them, and because both weak cooperation and strong conflict are fast-changing international interactions and so also the external variables which best explain them.

By comparing the above-mentioned results with the theoretical interpretations available in the literature for international interactions, it soon became evident that the above-mentioned empirical results do not explain either the onset or the end of international interactions. They explain only the middle stage, i.e., the continuation process of such interactions. Both internal and external variables were found to be relevant to the onset of all international interactions. But external variables were found to be relevant to the end of slow-changing international interactions and internal variables were found to be relevant to the end of fast-changing international interactions.

Dispensing with the terms of internal and external and using

instead the terms proximal for the explanatory variables responsible for the continuation of international interactions regardless of such variables being internal or external, and distal for the explanatory variables responsible for the end of international interactions regardless of such variables being internal or external, we arrive at the following two explanatory principles for all international interactions: 1) all international interactions occur as a result of a combination of both proximal and distal variables, continue as a result of the stability of their proximal variables, and end as a result of a change in their distal variables, and 2) the identity of the proximal and distal variables in terms of internal vs. external is a function of both the change rate and the developmental status of such interactions.

In sum, the study has shown that there are two types of international interactions, each with its own explanatory model, emphasizing the importance of internal or external explanatory variables at a different developmental stage.

FOREWORD

The method of documentation used in this study is the one used by psychologists, sociologists, and other social scientists. It differs from the one used by political scientists. It has the advantage of evading numbers, repetitions, and of providing the reader with immediate documentation. Political scientists should adopt this method.

The laws and theories arrived at in this study are of heuristic nature, i.e., their scientific value lies in their demonstrated capacity to generate further new hypotheses. Final confirmation or rejection of such laws and theories has to await the emergence of a comprehensive theory of international interactions.

No attempt was made to use qualitative theories or evidence in developing the basic theory offered in this study. Such use would weaken the epistemological status of the emerging quantitative theory because if qualitative theory is to be taken as the final evidence for quantitative theory, then there is no meaning for quantitative work.

The quotations written at the beginning of each chapter are meant to give the reader a summary of the main point in each chapter.

Professors Abraham Bargman, Richard Styskal, and Howard H. Lentner contributed a lot through their teachings, discussions, and writings. However, if the study does not appear to be perfect, it is because I sought their advice and not their consent.

-Ahmed Zaky

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INTRODUCTION

This introduction aims at clarifying several theoretical issues that occur in this study. Among these issues are the nature of theories and models and the relations among them; the varied meanings of the concepts of reciprocity, development and underdevelopment, and international interactions; and phenomenology and its appropriate statistical analysis.

Scientists are concerned with generating theories, not models. But when theories are hard to generate, due to the complexity of the phenomena, the only alternative available is models. The difference between theories and models, at least in social science, is one of degree and not of kind since the more the models approach the phenomena which they model, the more likely they are to become the theories of such phenomena. Models, however, still differ from theories in that they make less claim to validity than theories, in the meaning that the existence of a model of a phenomenon does not preclude the existence of another model for the same phenomenon. A model of a phenomenon is only <u>one</u> among several possible models for such phenomenon. On the other hand, theories make a stronger claim to validity in realtion to the phenomena which they try to explain. A theory of a phenomenon claims to be <u>the</u> theory of such phenomenon. As such there is no opposition between theories and models. Each of them represents an effort toward theorizing and each of them is preferred under certain appropriate conditions. When the phenomena are clearly understood, then theories are preferred to models, and when such phenomena are vague and complex models are

preferred. Now given this to be the case, then it is obvious that the situation in political science in general and in international politics in particular would favor models over theories. Furthermore, even if highly abstract and complex theories could be currently developed in political science and in international politics, models are still needed to test them since such abstract and complex theories cannot be tested directly. They can be tested only through testing a statistical hypothesis derived from them. In these situations the hypotheses become statistical models for the theories. As such models are an essential part of political science theorizing.

In this study we attempt to evaluate the importance of internal vs. external variables in explaining different types of international interactions. The evaluation model used is that of multiple regression. This model was chosen because it is a powerful statistical technique. The word "powerful" refers to its capacity to extract and explain larger amounts of variance in the dependent variable. The multiple regression model has several assumptions which should be satisfied if the model is to yield valid results. If such assumptions are not satisfied, then statistical remedies should be sought before the results of the model are accepted. One of these assumptions, however, has no statistical remedies and that is the specification error assumption which states that the researcher is in possession of a complete explanation of the phenomenon he is seeking to explain (Koutsouyiannes, 1973, p. 114). This assumption is needed to make theoretical evaluations of the resulting regression parameters. At this stage of our knowledge in international politics this is an impossible demand, and we have had to get around it by utilizing in our explanatory models the most powerful and

widespread external variable in the form of equivalent reciprocity and the most strong and stable internal variables in the form of economic development and size and then tie these explanatory variables to already existing theoretical positions in international politics known as sovereignty and marxism.

Sovereignty was tied to the external explanatory variable of equivalent reciprocity through a series of theoretical links as follows: sovereignty means legal equality, the attribute of equality usually generates reciprocity in interactions, reciprocity means literally the exchange of resources, services, and behaviors and such exchange refers by definition to the external variables. As such the concept of sovereignty must include in its operational definition a reference to reciprocity, i.e., the external behavior. It should be noted here that sovereignty is tied to equivalent reciprocity, i.e., to reciprocity in which the behaviors exchanged are similar in both quality and quantity. Other types of reciprocities in which the behavior exchanged differs on one or both of these two dimensions of quality and quantity exist, although they might not be logically related to sovereignty. In our study we empirically examined another type of reciprocity, i.e., opposing reciprocity, and developed hypotheses regarding another two possibile types, i.e., generalized and non-equivalent reciprocity. Marxism was tied to the internal explanatory variables of economic development and size because of the emphasis which such theory puts on the role of internal economic development in international interactions (Waltz in Greenstein et al., 1975, p. 17). and because our statistical measures indicated that size puts constraints on economic development once such

development has started. And it is this emphasis which marxism puts on economic development which led us to analyze the data separately for the underdeveloped states as well as for the developed states.

In sum, both sovereignty and marxism were utilized as alternative, but complete, explanations of international interactions, although no implication is made to the effect that our above-mentioned interpretations and operational definitions of these two theories are their only possible interpretations and definitions. Sovereignty and marxism are too rich and complex theories to be pinned down by such limited interpretations and definitions.

There is no agreement among the authorities on the meanings of economic development. Strictly speaking economic development means structural-functional changes in the economy. But economists, up to now, are unable to measure such structural economic changes (Kindelberger, 1965, p. 3). They have to resort to growth measures to represent such structural changes, although it is obvious that economic growth may continue to occur without further structural changes in the economy. In our study we used several growth measures as operational definitions of the underdevelopment-development continuum. Yet statistical cutting points on such measures are meaningless because of the extreme skewness of the distribution of the states on such measures. Thus we have had to resort to the self-identification of the states as developed or underdeveloped, as a criterion of their economic developmental status, i.e., all the states which declared themselves in international negotiations over economic issues (e.g., GATT) as underdeveloped were classified as such and all other states were classified as developed. The theoretical

relevance of this criterion rests on the observed fact that self-identification of the states as underdeveloped or developed has implications for their international interactions. Such criterion argues against both the western-oriented conception of development and underdevelopment as purely internal phenomena (Higgins, 1968, pp. 347-348) and the leftist-oriented conception of development and underdevelopment as a phenomenon composed simultaneously of both internal and external variables, i.e., a phenomenon composed of internal backwardness or growth, and their international interactions, i.e., development is a function of underdevelopment and vice versa (Cockcroft, Frank and Johnson, 1972, Ch. 3, 12). Adopting the western-oriented definition would make some OPEC countries developed states, which they are obviously not--rich maybe but certainly not developed. And adopting the leftist-oriented definition would make the study, within the limits of the multiple regression model, impossible because there would be no differentiation between the dependent and independent variables. This, of course, does not imply that the leftist-oriented definition of development and underdevelopment is conceptually or theoretically wrong. On the contrary, there is much empirical evidence in both the western-oriented writings (Cohen 1973, p. 218; Knorr, 1973, p. 120) and the leftist-oriented writings (Magdoff, 1969; Jalee, 1972) which attest to the validity of the leftist-oriented conceptualization and theory of development and underdevelopment. Our incapacity to test the leftist-oriented definition is a function of the statistical model utilized in the study. Multiple regression permits the use of <u>several</u> independent variables to explain only <u>one</u> dependent variable at a time. An empirical test of

the leftist-oriented definition of development and underdevelopment would require the use of canonial correlations and regression models which are statistical models designed to permit sets of independent variables to explain sets of dependent variables at the same time, i.e., the independent variable would be composed of both internal and external variables and so the dependent variable (Thorndike, 1978, p. 177). But if so, then explanation models other than the ones arrived at in this study are quite possible for the phenomena of development and underdevelopment and their international interactions.

As we said above, scientists are concerned with generating theories. Adequate theories must be able to describe and explain our phenomenological realities. The phenomenological realities which we are concerned with explaining in this study are those of international interactions operationally defined in terms of events data which we grouped twice into six macro-initiated and six macro-received international interactions of Cooperative Action (CA), i.e., giving and receiving economic and military aid, Diplomatic Exchange (DE), i.e., negotiation, Participation (PR), i.e., routine diplomacy, Verbal Conflict (VC), i.e., verbal charges and threats, Nonmilitary Conflict (NM), i.e., diplomatic and economic hostilities, and Military Conflict (MC), i.e., war. Because interaction data are usually highly correlated, every two identical initiated and received interaction categories were statistically purified from the effects of all other ten initiated and received interaction categories through the use of partial correlations. Partial correlations give us the correlations, not between the original variables, as the zero order correlations would do, but between the residuals of

such original variables. That is, zero order correlations give us correlations between phenomenological realities and partial correlations give us correlations between essences of such realities. Yet in interaction phenomena zero order correlations are usually spurious and thus useless as explanatory devices. They are of value here only as descriptive devices. As such, a clash exists between our respect for the phenomenological realities of the dependent variables which we want to explain and the need to explain such variables. In reporting the results of our study, both the zero order and the partial correlations are discussed and the reader may take his pick if he chooses. However, a solution for this problem, which was not utilized in the study, lies in the form of part, not partial correlations. Such part correlations would have removed the effect of all ten initiated and received interactions from the independent variables and not from the dependent variables, i.e., from the explanatory variables and not from the explained variables, thus respecting the phenomenological realities of the international interactions which we want to explain and at the same time providing them with valid explanations. This, of course, implies that the results of our study are a function of its correlational procedures. These results are not faulty, but the implication is that the use of another correlation procedure in the form of part correlations might have led to other explanatory models because part correlations are likely to be smaller than partial correlations (Thorndike 1978, p. 133) and certainly smaller than zero order ones.

This emphasis on the phenomenological realities of international interactions should not stop with the issue of their statistical analysis.

It should be extended to their operational definitions. As we mentioned above, international interactions are defined in terms of events, representing the action of the states toward each other. In an area like international politics where data was until recently almost nonexistent, this is quite an advance. Yet we feel that we are under no logical or theoretical obligation to accept the above-mentioned operational definition of international interactions. As a matter of fact we feel that such operational definitions are phenomenologically deficient. After all, there is more to war, i.e., MC, than the acts of military conflict. There are the internal economic and social sacrifices and mobilizations. There is more to diplomacy, i.e., DE and PR, than the exchange of proposals and counter-proposals. There are the internal pressure groups and the bureaucracy evading or pushing for an agreement. There is more to economic and military aid, i.e., CA, than giving and receiving such aid. There are the internal economic, social, and political effects in both the giver and the receiver states. And finally there is more to nonmilitary hostilities, i.e., VC and NM, than the exchange of charges and threats. There is the internal political and social atmosphere which usually accompanies such hostilities, e.g., McCarthyism and Stalinism. But if so, then more data in the form of the internal accompanying events is needed to represent adequately and to define operationally the dependent variables which we want to explain, i.e., international interactions. But again, if the operational definitions of international interactions are going to be so drastically changed, then it is highly probable that their explanatory models would be different from those which we identified in this study. That is, other explanatory models

could emerge from a comprehensive as against the currently restricted operational definition of international interactions.

To sum up, different, i.e., more comprehensive, operational definitions for development and underdevelopment and for international interactions might have led to different explanatory models; and different correlational procedures, i.e., part correlations, and different regression procedures, i.e., canonial regression, might also have led to different explanatory models. Add to all this the fact that a dynamic analysis of the events data of international interactions, with its own model possibilities in the form of multiple time series analysis, markov chains, etc., etc., has not been attempted, and it becomes clear that whatever laws and theories are arrived at in this study are mere models among several other possible, yet by no means endless, models. All this, however, should not be taken to imply that the study is a worthless explanatory effort. Within the limits of its operational definitions and its statistical procedures it has generated some broad generalizations and has led to some unexpected results which, if looked upon as models, then as we said at the beginning of this introduction obviously do not preclude the existence of other models.

CHAPTER ONE

MODELS

> The basic problem of contemporary international politics is the evaluation of the relative role of internal vs. external variables in explaining international interactions. Every author has his preferred list of the variables which he thinks are relevant and which are never put to a test except in a non convincing, selective after the fact manner with the result that no theoretical advances are ever made. The problem, however, is solvable if explanations are set in terms of the abovementioned two alternatives and combinations of them and empirical tests are applied to settle the issue and it would be highly advantageous if the contents of such alternatives are selected on theoretical basis.

Models, statistical or otherwise, like theories are simplifications of reality. Models, however, are better suited than theories for an underdeveloped area of research like that of international politics, because they permit direct testing by data and theories do not. In order to test theories they must be modeled first and tested by data second and this is what we intend to do here with Sovereignty, Marxism, and a variety and combination of them.

Equality and inequality among states are obvious facts with not-so-obvious implications for the international interactions of such states. According to international law states are sovereign and thus legally equal. Yet the diversity of their material and social conditions

obviously imply that they are unequal. As such the states face a behavioral dilemma. If equality implies reciprocity as anthropological literature leads us to believe (Lévi-Strauss, 1969, p. 266), then in order to affirm their international equality states should behave reciprocally. Yet their very internal material and social conditions certainly affect their capacity for such behavioral reciprocity. Now given this to be the situation, then the relevant research question becomes one of identifying those types of international interaction which, regardless of the internal conditions of the states, are highly reciprocal, against those types of international interaction which, regardless of the equality reciprocity thesis, are highly conditioned by the internal material and social conditions of the states. To put it in other words, what is at stake here is a question of the relative importance of the external vs. internal variables in explaining the different types of international interactions. This is the problem investigated in this study and current theories of international politics, i.e., realism and systems theory, cannot help us answer this question.

In international law, most if not all writing regarding the sovereignty of the states is concerned with identifying the conditions for both the internal and the external sovereignty of such states. Thus it is said that sovereignty implies legal equality among the states, that sovereignty whether internal or external is limited sovereignty, i.e., sovereignty within the law (and that this must be so since otherwise legality would imply illegality which is a logically untenable position [Middleton in Stankiewicz, 1969]), that the test of internal sovereignty is whether the state or any other entity is in control of the country

and that the test of external sovereignty is whether the state is de jure and not de facto free from outside control (Kelsen in Stankiewicz, 1969). Yet at no point legal theorizing points to the behavioral implications of the sovereignty equality thesis in terms of its expected behavioral effects. This, however, is not a deficiency in legal theory. By its very nature the law establishes norms and does not describe actual behavior. It is science which does so. And if we took the sovereignty equality thesis literally and added to it the abovementioned anthropological postulate which states that equality generates reciprocity, then the sovereignty-equality-reciprocity thesis could provide us with an explanatory model for international interactions which is expressed in the following two equations:

Model One

$$I = R_e$$

$$R = I_e$$

where I means international interaction behavior initiated by the states, R means international interaction behavior received by the states, I_e means initiated equivalent behavior, i.e., reciprocal, and R_e means received equivalent behavior, i.e., reciprocal.

Anthropological literature, however, recognizes one type of reciprocity, i.e., reciprocity in kind. Another type of reciprocity obviously exists, i.e., reciprocity in opposition. This occurs when cooperation is responded to by conflict and vice versa. Reciprocity in opposition could occur in situations which could range from dissatisfaction to frustration due to causes which could range from deception to

exploitation. This second type of reciprocity could provide us with a second model of international interactions which is expressed in the following two equations:

Model Two

$$I = R_o$$

$$R = I_o$$

where I and R mean the same as in model one, I_o means initiated opposing behavior, i.e., reciprocal, and R_o means received opposing behavior, i.e., reciprocal.

But then it is reasonable to assume that the states, in initiating and receiving international interactions, take into account all types of relevant behavior, i.e., the relevant equivalent as well as the relevant opposing. So we could combine Models One and Two above into a third model of international interactions which is expressed in the following two equations:

Model Three

$$I = R_e - R_o$$

$$R = I_e - R_o$$

where all the symbols have the same meanings as in Models One and Two above.

That the inequality of the states, as represented by the diversity of their internal material and social conditions, has an effect on their international interactions is a thesis which has been stated by a series of philosophers and economists. Thus Plato gave the advice to

the effect that to avoid war states should strive to have a moderate level of consumption and prosperity. He rationalized this advice on the basis that such moderate states would be less attractive as a victim of aggression (Haas, 1974, p. 163). Also classical economists such as Adam Smith, Saint Simon, August Comte, and Herbert Spencer all agree that because of their poverty agrarian states are aggressive and because of their preoccupation with economic development and trade capitalist states are peaceful. Thus the consensus until the early nineteenth century was that economic development creates peaceful international interactions among the states (Haas, 1974, p. 164).

It is with Marx that such consensus began to disintegrate. Thus, although Marx himself agreed with previous thought to the effect that agrarian states are more prone to war and that capitalist states are more prone to peace, he qualified such agreement, as far as capitalist states are concerned, by stating that capitalists states in time of crises, i.e., when as a result of underconsumption supply exceeds demand and the rate of profit declines, will have to seize markets abroad by force in the form of imperialism (Haas, 1974, p. 166). Capitalism, after all, cannot be trusted to be that peaceful. Communism is. Peaceful international interactions will come when communism replaces capitalism (Haas, 1974, p. 165). After Marx and up to the present time three lines of thought emerged. One was led by Rosa Luxemburg and stated that technological advances coupled with stable labor wages must result in underconsumption and excess of supply over demand. Such excess of supply must be sold by force, if required, in overseas markets, the thing which leads to war and imperialism (Cohen, 1973, Ch. 2). The

second line of thought was led by Lenin and stated that the development of finance capital coupled with the decline of the rate of profit at home must result in a search for overseas markets in which such capital could be invested. Such markets for capital investments have to be seized by force because of the competition among the capitalist states over them, the thing which leads to war and imperialism (Cohen, 1973, Ch. 2). The third line of thought is the contemporary writings on the capitalism-neocolonialism thesis which states that, although the colonies have recently become independent, in actuality they are not. Because of their economic underdevelopment they are unable to compete effectively in the two areas of trade and investments. Simply, the underdeveloped states receive unfavorable prices for their exports of raw material and pay excessive prices for their imports of finished products and the multinational corporations drain them of their wealth. Thus economically they are exploited and politically they are dependent because as a result of their economic underdevelopment and dependence, the options for their political behavior are determined from outside (Cohen, 1973, Ch. 4).

Material and social inequalities of the states are thus, according to the Marxist writings, facts which affect their international interactions and lead to war and imperialism. A strict test of the Marxist inequality theory of international interactions would have to compare the international behavior of the developed capitalist states with that of the developed communist states and that of the underdeveloped states. However, if we noticed that communist states did engage, even among themselves, in conflict and war, then the logical test of the effects of the

inequality of the states on their international interactions would be to compare the international behavior of the developed states, capitalist and communist combined, against that of the underdeveloped states according to the following model:

Model Four

$$I = ED + SZ$$

$$R = ED + SZ$$

where I and R have the same meaning as in Models One, Two, and Three and ED means economic development and SZ means size. Size is included in the equations because it puts some limit on the economic development of the states once such development has been achieved. Approximately ten percent of such development could be attributed to size.

As written, the sovereignty models explain international interactions in terms of external variables alone and also as written the Marxist model explains such interactions in terms of internal variables alone. But since international interactions, like any other social phenomenon, are likely to be multidetermined, then a fifth model which combines all the above models, thus permitting us to explain international interactions in terms of both external and internal variables combined, could be written as follows:

Model Five

$$I = ED + SZ + R_e - R_o$$

$$R = ED + SZ + I_e - I_o$$

where all the symbols have the same meanings as in Models One, Two, Three, and Four above.

The five models generated from sovereignty, Marxism and a combination of them would help us answer two questions relevant to the evaluation of the relative importance of external vs. internal variables in explaining the international interactions of the states. These two questions are as follows: 1) are the established values of the regression parameters of the explanatory variables in the models independent of the pattern within which they occur?--i.e., are they independent of the effects of underdevelopment and development? 2) are the models equally applicable to every type of international interaction or are certain models best fitted for some types of international interactions and other models best fitted for others?--i.e., are the models general or specific?

Before we are able to answer these two questions we have to specify the population of the states used in the study, examine the characteristics of the data used to test the models to see how far such data fits the requirements of the linear regression model, examine any resulting problems, and evaluate any suggested solutions. All these methodological issues would take us to the next chapter on Method.

CHAPTER TWO

METHOD

> In a choice between establishing a theory to fit a group of variables which are precisely measured and testing a theory through an imprecise measurement of its variables, we opt for the second choice. Insight and not precision per se is what science is all about.

Our research will analyze data related to the internal characteristics of the states in terms of their economic development and size and data related to their international interactions in terms of initiated and received behaviors through simple and multiple linear regression models.

The states used are those which were in existence during the period of January 1, 1966, to August 31, 1969. During this period there were 135 formal political entities which legally qualify as states. We could not find data related to the economic development (ED) or size (SZ) of the three states of Maladive, Swaziland, and Vatican and they were dropped from the analysis, leaving us with 132 states or 98 percent of the total population of states. Out of the 132 states used, 96 qualified as underdeveloped and 36 states qualified as developed. The basis for classifying a state as underdeveloped or developed is a political and not an economic one, i.e., it is whether a state had declared itself to be underdeveloped or not. Thus all the states in North America and

Europe plus South Africa, Israel, Japan, Australia, and New Zealand were considered developed and all the states in South America, Africa, and Asia were considered underdeveloped. A list of the states used and their developmental status appears in table 2.1 on the following page. The decision to use a political instead of an economic criterion for classifying the states into underdeveloped and developed was made because of the extreme variability among the states' measures of economic development, a variability which made any statistical cut-off point theoretically meaningless. Furthermore the self-identification of the states does have implications for their international interactions. The statistical analysis of the data which is reported in chapter three is carried separately for the underdeveloped states, for the developed states, and for the total population of the states.

There is no agreement among economists or political scientists on the exact operational definitions of economic development or size. Different authorities advocate different operational definitions (Salmore, 1972, ch. 5). In the face of this theoretical difficulty many research workers have adopted the strategy that for any group of states, for any specified period, whatever indices correlate highly with each other would be taken as operational definitions for ED and for SZ. For the year 1965, which is the year preceding the period 1966-1969, data is available in the World Handbook of Political and Social Indicators (WHBPSI) on many indices usually utilized in measuring ED and SZ. Salmore correlated and principal-component analyzed several indices related to ED and SZ for 73 states chosen on the basis of their providing a balanced set of cooperative and conflictive international interactions.

TABLE 2.1

STATES USED IN THE STUDY
AND THEIR DEVELOPMENTAL STATUS

Underdeveloped States

* 1.	Cuba	33.	Upper Volta	*65.	Iran
2.	Haiti	34.	Equatorial Guinea	*66.	Turkey
3.	Dominican Rep.	35.	Liberia	*67.	Iraq
4.	Jamaica	36.	Sierra Leone	*68.	Egypt
5.	Trinidad	*37.	Ghana	*69.	Syria
6.	Barbados	38.	Togo	*70.	Lebanon
* 7.	Mexico	39.	Cameroon	*71.	Jordan
8.	Guatemala	*40.	Nigeria	*72.	Saudi Arabia
9.	Honduras	41.	Gabon	*73.	Yemen
10.	Salvador	42.	Cen. African Rep.	74.	South Yemen
11.	Nicaragua	43.	Chad	*75.	Kuwait
12.	Costa Rica	44.	Congo (B)	76.	Afghanistan
13.	Panama	*45.	Congo (K)	*77.	China (P)
*14.	Colombia	46.	Uganda	78.	Mongolia
15.	Venezuela	*47.	Kenya	79.	China (T)
16.	Guyana	*48.	Tanzania	80.	Hong Kong
17.	Ecuador	49.	Burundi	*81.	N. Korea
18.	Peru	50.	Rwanda	*82.	S. Korea
*19.	Brazil	51.	Somalia	*83.	India
20.	Bolivia	*52.	Ethiopia	*84.	Pakistan
21.	Paraguay	*53.	Zambia	85.	Burma
*22.	Chile	*54.	Rhodesia	86.	Ceylon
*23.	Argentina	55.	Malawi	87.	Nepal
24.	Uruguay	56.	Lesotho	*88.	Thailand
25.	Gambia	57.	Botswana	*89.	Cambodia
26.	Mali	58.	Malagasy	*90.	Laos
27.	Senegal	59.	Mauritius	*91.	N. Vietnam
28.	Dahomey	*60.	Morocco	*92.	S. Vietnam
29.	Mauritania	*61.	Algeria	*93.	Malaysia
30.	Niger	*62.	Tunisia	*94.	Singapore
31.	Ivory Coast	63.	Libya	*95.	Philippines
*32.	Guinea	*64.	Sudan	*96.	Indonesia

Developed States

* 1.	U.S.A.	* 5.	Netherlands	* 9.	Switzerland
* 2.	Canada	* 6.	Belgium	*10.	Spain
* 3.	U.K.	7.	Luxemburg	*11.	Portugal
4.	Ireland	* 8.	France	*12.	Germany (F)

TABLE 2.1 - Continued

Developed States		
*13. Germany (D)	*21. Yugoslavia	29. Norway
*14. Poland	*22. Greece	*30. Denmark
*15. Austria	*23. Cyprus	31. Iceland
*16. Hungary	*24. Bulgaria	*32. South Africa
*17. Czechoslovakia	*25. Rumania	*33. Israel
*18. Italy	*26. U.S.S.R.	*34. Japan
19. Malta	27. Finland	*35. Australia
*20. Albania	*28. Sweden	*36. New Zealand

*These states are the ones used in Salmore's (1972) study.

His results showed that 1) GNP per capita, radios per 1000 population, literacy percentage, and percentage of agricultural share of GNP are the best indicators for ED for these states for the year 1965; 2) population, agricultural area in 1000 km^2 and military manpower are the best indicators of SZ for these states for the year 1965; 3) it is possible through principal component analyses to extract one factor explaining over 83 percent of the variability within the indices of ED; and 4) it is possible through the same technique also to extract one factor explaining over 74 percent of the variability within the indices of SZ (Salmore, 1972, ch. 5). States used by Salmore are identified by an asterisk in table 2.1 above. In our study we used a larger number of states than that used by Salmore, yet we decided to use his measures for ED and for SZ because this creates a sense of continuity of research in international interactions and permits comparative evaluation for both his results and ours.

The international interactions data used are those of the World Events Interaction Survey (WEIS) by Charles McClelland. The WEIS is composed of 22,965 event data covering the period from January 1, 1966, to August 31, 1969. Out of the total WEIS data 2187 event data or 9 percent of the total data were not utilized in the analysis because they represent interactions among formal and nonformal international organizations. The rest, i.e., 20,778 events or 91 percent of the total representing international interactions among the states and between the states and international organizations, was included in the analysis. The rationale for including events related to the interaction of the states and international organizations is that such events are a significant

part of the behavior of the states. There were 1,038 such events or 5 percent of the total WEIS data.

The word event refers to major disturbance above the routine level which usually finds its way into the press. The word interaction is used to differentiate the WEIS events from transaction events. Transaction events are routine, aggregated, nonnoticeable, and nonpolitical flows, but interaction events are turbulent, public, political flows which make news because their actors aim at influencing each other (Kegley, 1975, pp. 91-105). The WEIS data was collected from the City Edition of the New York Times (NYT) and was coded by McClelland into 63 categories which could be regrouped into 22 major categories. Salmore used principal factor analysis to extract the basic dimensions of the WEIS events. He identified two underlying dimensions, one for commitment and one for affect. The commitment dimension or factor is called Inverse Commitment because international interaction categories high on it represent low commitment of internal resources and international interaction categories low on it represent high commitment of such resources. The affect dimension or factor is a bipolar one and is called cooperation-conflict, with international interaction categories representing cooperative behavior having negative loadings on it and international interactions categories representing conflict behavior having positive loadings on it. These two dimensions of commitment and affect explain about 80 percent of the variability in the WEIS data. In relation to these two independent dimensions Salmore classified the WEIS events into only six international interaction categories (Salmore, 1972, ch. 4). McClelland's classification of the WEIS events and Salmore's

classification of such events and the relation between them are available in table 2.2 below. Here we will discuss only Salmore's classification of the WEIS data. It was adopted for our study because of its simplicity.

Salmore's classification of the WEIS event data was as follows. 1) There are three categories of cooperation, each of which is stronger on both the two dimensions of commitment and affect than the one which follows behind it: Cooperative Action (CA) which is the category of giving and receiving economic and military aid, Diplomatic Exchange (DE) which is the category of negotiation, Participation (PR) which is the category of routine diplomacy. 2) There are three categories of conflict, each of which is stronger on both the two dimensions of commitment and affect than the one which follows behind it: Military Conflict (MC) which is the category of war, Nonmilitary Conflict (NM) which is the category of economic and diplomatic hostilities, and Verbal Conflict (VC) which is the category of verbal and ideological hostilities. In connection with this classification of international interaction events we should note several points. 1) Salmore's study used international interactions events only for the period January 1, 1966, to December 31, 1968. 2) His study used interaction data belonging to the above-mentioned 73 states having a balance of cooperative and conflictive interaction events. Such balance is necessitated by the normality assumption required by principal factor analysis. 3) His study failed to classify five types of event data but we classified them according to what seem to be their appropriate categories (see table 2.2 below). 4) His study found the distribution of the utilized events data over their states to be highly skewed and Salmore had to use common logarithmic

TABLE 2.2

McCLELLAND'S AND SALMORE'S CLASSIFICATION OF THE WEIS

McClelland's Classification	Salmore's Classification
Give Verbal Support	
Promise Material Support	
Extend Economic Aid	Cooperative Action
Military Assistance	
Other Assistance	
Pessimistic Comment	
Neutral Comment	
Optimistic Comment	
Explain Policy Position	
Consult-Neutral Site	
Visit	
HostMeeting	
Praise, Hail	Participation
Surrender, Submit	
Yield Position, Retreat	
Retract Statement	
Express Regret, Apologize	
Promise Policy Support	
Promise Future Support	
Assure, Reassure	
Give State Invitation	
Grant Privilege	
Make Substantive Agreement	
Agree to Future Action	
Request Information	
Request Policy Assistance	
Request Action	
Appeal to	Diplomatic Exchange
Offer Proposal	
Urge Action Policy	
Refuse, Oppose	
Deny Accusation	
Cancel Planned Event	
Reject Proposal or Demand	
Criticize, Charge	
Denounce	

TABLE 2.2 - Continued

McClelland's Classification	Salmore's Classification
Complain	
Formal Protest	
Deny Accusation	
Demand	
Warn	Verbal Conflict
Suspend Sanctions	
Return Persons or Property	
Threat-Nonspecific	
Threat-Force Specified	
Ultimatum	
Military Mobilization	
Reduce International Activity	
Suspend Aid	Nonmilitary Conflict
Halt Negotiation	
Break Relations	
Arrest Persons	
Request Material Assistance	
Expel Persons	
Expel Organizations	Military Conflict
Seize Positions	
Military Engagement	

Note: The following five events were not reclassified by Salmore but were reclassified by us as follows: Decline to Comment as Participation, Grant Asylum as Verbal Conflict, Nonmilitary Demonstration as Diplomatic Exchange, Destructive Act and Nonmilitary Injury as Nonmilitary Conflict. The basis for our classification is the position occupied by these five events in relation to the positions of the six international interaction categories in the two-dimensional space of commitment and affect.

transformations to create the normality of distribution required by principal factor analysis. This fact implies that the factor loadings of the above-mentioned six international interaction groups on the two dimensions of commitment and affect are expressed in logarithmic forms. Now since we are going to use these factor loadings to weight frequencies within each of these six international interaction categories, then it follows that the results of our regression analysis will be expressed in logarithms and not in terms of simple numerals. Table 2.3 below reports the factor loadings of the six international interaction categories on the two dimensions of commitment and affect.

Up to now we have described the data to be used in the analysis and pointed to some of its minor limitations. In what follows we will turn our attention to 1) measurement problems of both the WHBPSI data and the WEIS data, 2) structural problems of the models' regression equations. Both of these two types of problems are certain to affect the values of the regression parameters and thus require some detailed discussion.

The measurement problems of the WHBPSI data are three. Data is missing for some states and the reported data has both validity and reliability problems of unknown magnitude. Some data related to the above-mentioned indices of ED and SZ is missing for some states. We generated such data through regressing the index with missing data on another index which Salmore's work has shown to have the highest possible correlation with it, then predicting the missing data from the resulting regression equations. Most of the missing data belongs to the underdeveloped states. Thus the missing data is not random and the

TABLE 2.3

PRINCIPAL FACTOR ANALYSIS OF THE WEIS

			Unrotated Factors	
		h^2	I	II
Cooperative Action	(CA)	.78	.72	-.50
Diplomatic Exchange	(DE)	.86	.91	-.17
Participation	(PR)	.88	.92	-.16
Verbal Conflict	(VC)	.79	.89	.10
Nonmilitary Conflict	(NM)	.69	.80	.22
Military Conflict	(MC)	.81	.68	.58
Percent of Total Variance			68.3	11.5
Eigen Value			4.1	.7

Source: Salmore, 1972, p. 146.

replacement estimates made through regression with available data were done with systematically different subsets of populations with the result that the replacement estimates cannot be said to be representative of the original population of data. This is likely to affect the validity of the international interaction models of the underdeveloped states (Cohen and Cohen, 1975, pp. 269-270). Yet due to the fact that the final measures of ED and of SZ are actually figures composed of the summation of the values of several weighted indices, then the size of bias in such figures is likely to be small because it is highly improbable that all the indices of either ED or SZ for many underdeveloped states are generated values.

The authors of the WHBPSI stated that their data suffers from the following problems: 1) for political and bureaucratic reasons some governments would deliberately distort their data; 2) the quality of the reported data is a function of the economic development of the reporting states; 3) there is a lack of international agreement on the definition of certain concepts used to collect the data (Hudson and Taylor, 1972). Both the first and the third problems imply that the WHBPSI has validity problems and both the first and the second problems imply also that such data has reliability problems. The magnitude of such validity and reliability problems cannot be estimated except after the above-mentioned three problems are solved. But the fact is that up until now, they do exist and as such they will lead to measurement errors which in turn will lead to biased estimates of the equations parameters.

The measurement problems of the WEIS data are also three. Secret international interaction data is certainly missing from published news

and there is no way for generating such data at present. Also there is no ultimate source of reality against which the validity and reliability of the news published in the New York Times could be compared. The available evidence implies that the New York Times publishes far less international interaction events than those which are reported in official sources and publications (Salmore, 1972, ch. 3). All these validity and reliability problems are generating measurement errors, in yet unknown quantities, and leading to biased estimates of the equations parameters.

A combination of measurement errors in both the WHBPSI data representing the independent variables and the WEIS data representing the dependent variables will lead to an upward bias for the alpha parameter and a downward bias for the beta parameter. The statistical remedies known for this situation such as the instrumental variables method or the maximum likelihood method would require the availability of currently nonavailable extra information about the nature of international interactions (for the instrumental variables method) or making unsupportable statistical assumptions about the nature of the distribution of such events (for the maximum likelihood method [Koutsoyaines, 1973, ch. 12, 16, 18]). As such we have only two choices: 1) to accept knowingly biased alpha and beta values for the equations parameters, or 2) to make the assumptions that more valid and reliable WHBPSI data would not significantly change the results and to restructure our conceptualization about the validity and reliability of the WEIS data so as to make it error free. We opt for the second choice. The WHBPSI data is for a population and not a sample and thus more valid and

reliable data is not likely to change significantly its systematic characteristics and the validity and reliability of the New York Times news could be restricted to and evaluated against the world of published news, and once this reconceptionalization is accepted then the New York Times news would appear to be both highly valid and reliable (Salmore, 1972, ch. 3).

The models equations face four structural problems: the problem of spurious correlations which usually accompanies interaction data, the problem of aggregation resulting from the need for conceptual simplifications, the problem of specification errors resulting from the incomplete nature of the theories and their models, and the problems of multicolinearity affecting model five. Such multicolinearity is to be expected if model four is to be successful. As we will see only the first problem of spurious correlations is open to practical solution through the use of partial correlations. Yet still we have to discuss the other three problems in order for us to be clear about the nature and limitations of the results of our study.

By definition interaction data, international or otherwise, is likely to be highly correlated and if such high correlations are to be used to generate the regression models, then misleading theoretical results are certain to follow because a smaller number of explanatory variables is likely to be accepted than what might be theoretically required. The rational strategy in such a situation would be to purify each zero order correlation between each two international interaction categories from the impact of all other categories related to them. This is done through computing partial correlations. Partial

correlations will be used in generating all five interaction models discussed in chapter one except model four and parts of model five. In model four I and R are regressed on ED and SZ and not on another interaction category as in the other models. Furthermore the measures for ED and SZ are those of the year 1965 and international interactions occurring in the period 1966-1969 could not, logically or empirically, be affecting anything occurring prior to them. By the same reasoning correlations between ED and SZ on the one hand and international interaction categories in model five will be also zero order correlations. But the correlation between the reciprocal independent variables and the dependent variables in model five will be partial correlations. As we will see in chapter three on Results, the difference between partial correlations and zero order correlations is so great as to mask the discovery of basic laws of international interactions.

As we mentioned above, in this study we are going to adopt Salmore's aggregation and categorization of the international interaction events data into the above-mentioned six categories and also his aggregation of several indices for ED and for SZ. The process of aggregation is known to have statistical effects on the equations parameters. Aggregating the dependent variables alone results in biased estimates of the equations parameters and aggregating the independent variables alone lowers the efficiency of such estimates since it enlarges their standard errors. Because we are using near population data in this study we are not going to use standard errors to evaluate the equations parameters. However, a theoretical problem still exists because we do not know what effects aggregating both the dependent and independent variables at the

same time has on the equations parameters. Of course an empirical answer to this problem could be generated through Monte Carlo studies, but this would fall far beyond the intended scope of this study and all we could do here is to point out the problem and recognize that it has unknown effects (Hannan, 1971).

A basic assumption of the multiple regression model is that the independent variables will provide complete explanation for the dependent variable. We do not expect even the most elaborate model, i.e., model five, to include a complete explanation for the international interaction categories. Excluding relevant explanatory variables leads to biased estimates of the equations parameters. The degree of such bias cannot be evaluated unless the correct explanatory model is known. We do not know the correct explanatory model. If it were known then this study would not need to be undertaken. But we must be able to recognize and theoretically evaluate the consequences of the specification error inherent in the structures of the models due to the deficiencies in the theories for which the models stand (Deegan, 1972, ch. 3).

Multicolinearity is a state of high correlations among the independent variables. If such state is to occur to a severe degree, then the estimations of the equations parameters would be indeterminate to the extent that even a computer might not be able to estimate them (Tufte 1974, p. 152). We expect some degree of multicolinearity to occur in model five. The ED and SZ variables should have some relevant correlations with the international interaction explanatory category, i.e., the reciprocal. This should occur if model four which regresses international interaction variables on ED and SZ is to be successful.

Two basic solutions exist for multicolinearity: 1) enlarge the data so as to lower the correlations among the independent variables, or 2) create low correlated new explanatory variables from the already existing independent variables. However, both of these solutions are inapplicable in our situation. We are using population data and there is no possibility for enlarging such data, and creating new low correlated variables from the existing explanatory variables is theoretically unacceptable because it would drastically change the structural nature of the models to the extent that they would not be representative of the theories tested. Therefore the decision is made here to report and closely examine model five as it is, noting at the same time the limitations and implications, both statistical and theoretical, of any degree of multicolinearity occurring.

In the face of all these methodological problems the question might be raised as to whether it is a good research strategy to use the linear multiple regression model in our study. The answer here is that in social science the regression model rarely provides a complete and perfect explanation when it is used. We seldom are in possession of a full theoretical explanation for the phenomena we are interested in. All we could achieve through the use of the regression model in social science phenomena is to demonstrate the theoretical relevance of some variables to the explanation of whatever we are interested in (Amick and Wallberg, ed., 1975, ch. 2) without claiming that the quantitative values of the equations parameters are final estimates for such parameters, and with this aim in mind we turn to the next chapter on Results.

CHAPTER THREE

RESULTS

> Simplicity is the name of the game in science. Scientists are lazy people who want to explain the whole world by a few statements. Thus if you have a theory which uses more than, say, four explanatory variables, forget it. In all probability it is faulty.

We stated in chapter two that we are going to use the factor loadings of the six international interaction categories on the two dimensions of commitment and affect to weight such categories. A look at table 2.3 in the previous chapter will show that the affect dimension is bipolar and that the three categories of cooperation have a negative sign. These negative signs are disregarded in weighting the three categories of cooperation because such signs are mathematical artifacts resulting from the very procedure of principal factor analysis which makes not only the second extracted factor, but also most of the subsequently extracted factors bipolar (Child, 1973, pp. 48, 52; Guertin and Bailey, 1970, pp. 92-93). And once this is done then we arrive at a set of results which is applicable mathematically and thus theoretically to both the dimensions of commitment and affect because weighting is nothing more than a linear transformation of the data required for the meaningful evaluation of different groups of such data and different linear transformations for the same groups of data should mathematically lead to identical regression parameters or results.

The results of the study will be reported for each model in three separate sets of figures: one for the underdeveloped states, one for the developed states, and one for the total population of states. Each set of figures will contain values of R, R^2, and Beta. R is the correlation coefficient which tells us the degree of covariation between two or more variables and which could range only from -1 to +1. R^2 is the square of R. It is the coefficient of determination which tells us the amount of variability in the dependent, i.e., explained, variable which is explained by the independent, i.e., explanatory, variables. Such a coefficient could range only from 00 to +1. Beta is a standardized regression coefficient which tells us in standardized terms the amount of expected change in the dependent variable as a result of one unit change in one independent variable, holding the effect of all other independent variables in the equation constant. Such a coefficient could range only from -1 to +1.

Tables 3.1 and 3.2 which follow report the results for model one. Table 3.1 is for results from zero order correlations and table 3.2 is for results from partial correlations. From these two tables we draw the following conclusions.

1) Regardless of the group of states used in the analysis, the zero order correlations are obviously larger than the partial correlations. Accepting the zero order correlations would imply that through equivalent reciprocity we have already achieved full explanation for some international interaction categories and substantial explanation of others. The fact that this is not true is obvious from comparing the zero order correlations results with those of the partial correlations.

TABLE 3.1

RESULTS OF MODEL ONE:
ZERO ORDER CORRELATIONS AND REGRESSIONS

	R	R^2	Beta
Underdeveloped			
CA	.60	.37	.60
DE	.90	.81	.90
PR	.95	.91	.95
VC	.81	.65	.81
NM	.68	.47	.68
MC	.87	.77	.87
Developed			
CA	.80	.65	.80
DE	.95	.91	.95
PR	.96	.93	.96
VC	.86	.74	.86
NM	.88	.77	.88
MC	.87	.76	.87
Total			
CA	.61	.38	.61
DE	.93	.86	.93
PR	.96	.93	.96
VC	.83	.70	.83
NM	.78	.61	.78
MC	.86	.74	.86

Note: The results are applicable for both I and R equations.

TABLE 3.2

RESULTS OF MODEL ONE:
PARTIAL CORRELATIONS AND REGRESSIONS

	R	R^2	Beta
Underdeveloped			
CA	.12	.01	.12
DE	.44	.19	.44
PR	.76	.57	.76
VC	.24	.05	.24
NM	.38	.14	.38
MC	.72	.51	.72
Developed			
CA	.27	.07	.27
DE	.70	.49	.70
PR	.73	.53	.73
VC	.0003	.00	.0003
NM	.42	.17	.42
MC	.69	.47	.69
Total			
CA	.05	.00	.05
DE	.47	.22	.47
PR	.76	.57	.76
VC	.16	.02	.16
NM	.36	.12	.36
MC	.70	.49	.70

Note: The results are applicable for both I and R equations.

The partial correlations results tell us that both the type of interaction category and the developmental status of the states are relevant variables affecting whether equivalent reciprocity is or is not a relevant explanatory variable. Furthermore the zero order correlations imply that development affects equivalent reciprocity mostly in the two interaction categories of CA and NM, a finding which is hard to explain in the case of NM. But the partial correlations tell us that development affects equivalent reciprocity in a more complex, yet more comprehensible way. Development increases the effects of such reciprocity in the case of CA and DE, and decreases it in the case of VC. Such findings are easier to explain. CA is the category of giving and receiving economic and military aid and the developed states due to their wealth are more able than the underdeveloped states to do so. DE is the category of negotiation, and again the developed states due to their sophisticated bureaucracies are more able than the underdeveloped states to do so. Underdeveloped states excel only in the category of VC which is the category of protests and threats, something which is explained in terms of their huge amount of grievances against both the developed states and each other.

2) More important, the zero order correlations mask an important relationship between equivalent reciprocity on the one hand, and cooperation and conflict on the other. A look at the zero order correlations (Betas) shows no clear pattern which could be related to the strength of the different interaction categories of cooperation and conflict. In contrast, a look at partial correlations (Betas) shows such a clear pattern. Table 2.3 in the previous chapter shows that regardless of the dimension

extracted CA is stronger than DE and DE is stronger than PR. Also MC is stronger than NM and NM is stronger than VC. The partial correlations show that equivalent reciprocity decreases with the increase in the strength of the cooperation categories and increases with the increase in the strength of the conflict categories, i.e., there is a negative relationship between equivalent reciprocity and the strength of cooperation and a positive relationship between equivalent reciprocity and the strength of conflict. This is what we call the Equivalent Reciprocity Law (ERL) and it would not have been discovered through zero order correlations.

What explanations do we have for the ERL? The negative relationship between equivalent reciprocity and the strength of cooperation could be explained in terms of the economic costs required to carry out the acts of cooperation. Lower levels of cooperation do not require much cost and states are to some extent able to reciprocate equivalently. Higher levels of cooperation do require much cost and states are to a large extent unable to reciprocate equivalently. Economics is involved in carrying conflict too, but here the cost is seen as a necessary expense for the preservation of the state, especially at the highest level of conflict, i.e., military conflict. Thus differential economic capacities among the states is the explanation for the negative relationship between equivalent reciprocity and the strength of cooperation and the necessary existence of the state is the explanation for the positive relationship between equivalent reciprocity and the strength of the conflict. A comparison of the Beta values of the underdeveloped states, which are mostly poor, with those of the developed states, which

are mostly wealthy, will support this interpretation. For cooperative interactions the two values of the lower category PR do not differ (.76 vs. .73), the two values of the middle category DE differ very much (.44 vs. .70) and the two values of the higher category CA differ extremely (.12 vs. .27). On the other hand for conflict interactions the two values of the lower categories VC differ extremely (.24 vs. .00), the two values of the middle category NM do not differ (.38 vs. .42), and the two values of the higher category MC also do not differ (.72 vs. .69). Differential Economy and Existential Necessity are the explanations behind the opposite relationships between equivalent reciprocity and the strength of both cooperation and conflict.

Tables 3.3 and 3.4 which follow report the results for model two. Table 3.3 is for the results from zero order correlations and table 3.4 is for the results from partial correlations. From these two tables we draw the following conclusions.

1) The zero order correlations imply that there is a negative correlation between opposing reciprocity and the strength of both cooperation and conflict. But the partial correlations reveal a more complicated relationship between opposing reciprocity and the developmental status of the states. The zero order correlations thus seem to offer a simpler explanation of the phenomena of opposing reciprocity. Yet we are inclined not to accept their results, not only because their high R^2 implies that, regardless of the group of states examined, between one-third and two-thirds of the variability of the dependent variables is already explained by the independent variables, but also because such results are not open to theoretical explanation in the case of DE

TABLE 3.3

RESULTS OF MODEL TWO:
ZERO ORDER CORRELATIONS AND REGRESSIONS

	R	R^2	Beta
Underdeveloped			
CA	.53	.28	.53
DE	.62	.38	.62
PR	.78	.60	.78
VC	.78	.60	.78
NM	.63	.39	.63
MC	.65	.42	.65
Developed			
CA	.68	.46	.68
DE	.82	.67	.82
PR	.86	.73	.86
VC	.83	.68	.83
NM	.82	.67	.82
MC	.68	.46	.68
Total			
CA	.56	.31	.56
DE	.72	.51	.72
PR	.80	.64	.80
VC	.82	.67	.82
NM	.72	.51	.72
MC	.65	.42	.65

Note: The results are applicable for both I and R equations.

TABLE 3.4

RESULTS OF MODEL TWO:
PARTIAL CORRELATIONS AND REGRESSIONS

	R	R^2	Beta
Underdeveloped			
CA	.15	.02	.15
DE	-.00	.00	-.00
PR	.06	.00	.06
VC	.08	.00	.08
NM	.17	.02	.17
MC	.21	.04	.21
Developed			
CA	.39	.15	.39
DE	-.47	.22	-.47
PR	.15	.02	.15
VC	-.08	.00	-.08
NM	-.40	.16	-.40
MC	.11	.01	.11
Total			
CA	.28	.07	.28
DE	-.13	.01	-.13
PR	.05	.00	.05
VC	.03	.00	.03
NM	.02	.00	.02
MC	.21	.04	.21

Note: The results are applicable for both I and R equations.

and NM. By definition the opposing reciprocity model regresses CA on MC and vice versa, DE on NM and vice versa, and PR on VC and vice versa. The relationship between CA and MC is explainable by the fact that initiating and receiving economic and military aid is related to engagement in military conflict. Also the relationship between PR and VC is explainable by the fact that engagement in routine diplomacy is done with the aim of influencing verbal conflict. But the relationship between DE and NM is not explainable at all when their correlations and Betas are positive as in the zero order correlations. DE is the category of negotiation and NM is the category of disengagement from such negotiation. It is the interaction category of halting and breaking formal diplomatic interactions. As such both the correlations and the Beta values for the relationship between DE and NM should be very low or of negative signs and that is exactly what the partial correlations give us, but only for the developed states. Thus we can dismiss the zero order correlations only if we could explain the partial correlations values of the underdeveloped states and the total population of states.

2) The partial correlations show a curvilinear relationship between opposing reciprocity and the strength of cooperation for both the underdeveloped states and the developed states, a positive relationship between such reciprocity and the strength of conflict for the underdeveloped states, and a curvilinear relationship between such reciprocity and the strength of conflict for the developed states. The total population of states follows the pattern of the underdeveloped states. This is understandable since the total population of states is composed mostly of the underdeveloped states. Relevant differences are

thus between the underdeveloped states and the developed states. Thus while the developed state decreases its DE or NM in the face of an increase in opposing reciprocity, a perfectly rational and as we pointed out above a logically expected type of behavior, the underdeveloped state disregards opposing reciprocity in the case of DE and responds positively to it in the case of NM. One possible explanation for this absurd type of interaction on behalf of the underdeveloped states might exist in the small unsophisticated bureaucracies of the underdeveloped states and thus their limited capacities to behave effectively in the face of different and varied international interactions. The fact that this is so is obvious from the low Beta values for all their interaction categories in the partial correlations of opposing reciprocity interactions except that of MC. But in the interaction category of MC the underdeveloped states are mostly receivers of the opposing reciprocity category of CA, i.e., economic and military aid usually given by the developed states to the underdeveloped states in the case of military conflict, and that is the reason why their Beta values are higher here than those of the developed states. This interpretation of the differences between the underdeveloped states and the developed states in their behavior toward opposing reciprocity is reflected in the underdeveloped states' complaint to the effect that due to their underdevelopmental status they are unable to compete effectively in the international system (Tucker, 1977). Now if such an interpretation of the differences between the Beta values of both the developed states and the underdeveloped states is accepted, then the zero order correlations should be dismissed and the partial correlations should be accepted

because the zero order correlations imply that the underdeveloped states behave in the face of opposing reciprocity in the same manner as the developed states do, something which the above analysis denies.

3) All this, however, does not imply that the opposing reciprocity model in its existing form has much of a theoretical value. Except for the two interaction categories of DE and NM of the developed states, the explanatory power of the opposing reciprocity model is too small for both the underdeveloped states and the total population of states. As judged from the values of R^2 the model's explanatory power ranges from .00 to .04 for the underdeveloped states and from .00 to .07 for the total population of states. Such R^2 values are too small to be of any theoretical importance. Thus the opposing reciprocity model, in its existing form, seems to be theoretically relevant only to few interaction categories belonging only to the developed states.

We will not report the results of model three because in both the zero order correlations and the partial correlations, several equations belonging to the developed states were affected by severe multicolinearity to the extent that the computer system was unable to generate their Beta values (Tufte, 1974, p. 152). Furthermore, with the exception of 2 out of 24 equations, the R^2 values of model three revealed that the addition of opposing reciprocity to equivalent reciprocity did not relevantly increase the explanatory power of the equations belonging to the underdeveloped states or the total population of states. So with or without multicolinearity model three is dismissed with little or no theoretical loss incurred.

Tables 3.5 and 3.6 which follow report the results of model four. Table 3.5 reports separate results for ED and for SZ and table 3.6

TABLE 3.5

RESULTS OF MODEL FOUR:
ZERO ORDER CORRELATIONS AND REGRESSIONS FOR ECONOMIC DEVELOPMENT (ED) AND FOR SIZE (SZ)

	I = ED			R = ED			I = SZ			R = SZ		
	R	R^2	Beta	R	R^2	Beta	R	R^2	Beta	R	R^2	Beta
Underdeveloped												
CA	.11	.01	.11	.07	.00	-.07	.49	.24	.49	.33	.11	.33
DE	.05	.00	.05	.03	.00	-.03	.39	.15	.39	.39	.15	.39
PR	.02	.00	.02	.01	.00	.01	.34	.12	.34	.35	.13	.36
VC	.03	.00	.03	.07	.00	-.07	.41	.16	.41	.44	.19	.44
NM	.09	.00	.09	.03	.00	-.03	.43	.18	.43	.48	.23	.48
MC	.06	.00	-.06	.06	.00	-.06	.34	.11	.34	.33	.10	.33
Developed												
CA	.29	.08	.29	.18	.03	.18	.73	.53	.73	.68	.46	.68
DE	.12	.01	.12	.11	.01	.11	.67	.46	.67	.68	.47	.68
PR	.24	.05	.24	.15	.02	.15	.71	.50	.71	.70	.49	.70
VC	.20	.04	.20	.26	.06	.26	.65	.43	.65	.67	.45	.67
NM	.20	.04	.20	.18	.03	.18	.63	.40	.63	.66	.43	.66
MC	.15	.02	.15	.36	.13	.36	.48	.23	.48	.60	.36	.60
Total												
CA	.50	.25	.50	.08	.00	.08	.44	.20	.44	.39	.15	.39
DE	.30	.09	.30	.29	.08	.29	.41	.17	.41	.41	.17	.41
PR	.37	.14	.37	.31	.10	.31	.38	.14	.38	.39	.15	.39
VC	.29	.08	.29	.23	.05	.23	.43	.18	.43	.45	.20	.45
NM	.27	.07	.27	.30	.09	.30	.44	.20	.44	.46	.21	.46
MC	.0065	.00	-.00	.18	.03	.18	.35	.12	.35	.37	.13	.37

TABLE 3.6

RESULTS OF MODEL FOUR:
ZERO ORDER CORRELATIONS AND REGRESSIONS
FOR BOTH ECONOMIC DEVELOPMENT (ED) AND SIZE (SZ)

	I = ED + SZ			R = ED + SZ		
	R	R^2	Betas*	R	R^2	Betas*
Underdeveloped						
CA	.52	.27	.16,.51	.34	.11	-.04,.33
DE	.40	.16	.09,.39	.39	.15	.00,.39
PR	.35	.12	.06,.35	.36	.13	.04,.36
VC	.41	.17	.07,.41	.44	.19	-.03,.43
NM	.45	.20	.13,.44	.48	.23	.01,.48
MC	.34	.12	-.03,.34	.33	.11	-.03,.32
Developed						
CA	.73	.54	.08,.70	.68	.46	-.01,.68
DE	.68	.46	-.08,.70	.69	.48	-.09,.71
PR	.71	.50	.03,.70	.70	.49	-.05,.71
VC	.65	.43	.00,.65	.67	.45	.07,.65
NM	.64	.40	.01,.63	.66	.43	-.01,.66
MC	.48	.23	.01,.47	.63	.40	.20,.54
Total						
CA	.66	.43	.48,.43	.39	.15	.06,.39
DE	.50	.25	.29,.40	.50	.25	.27,.40
PR	.52	.27	.36,.36	.50	.25	.30,.38
VC	.51	.26	.27,.42	.50	.25	.21,.44
NM	.51	.26	.25,.43	.54	.29	.28,.45
MC	.36	.12	-.02,.36	.40	.16	.16,.36

*First figure under Beta is for ED and second figure is for SZ.

reports their combined results. From these two tables we draw the following conclusions.

1) Size is a stronger explanatory variable than economic development. Regardless of the group of states used, the Beta values indidate so for both the initiated and the received behavior. When combined in one equation the Beta values of both ED and SZ do not show much change. This is due to the low correlation between these two variables. For the underdeveloped states the correlation between ED and SZ is -.09, for the developed states .29, and for the total population of states .03. Any observed fluctuation in the Beta values for the developed states in the combined results is due to the somewhat moderate correlation between ED and SZ in such group of states. The relevant theoretical question here, however, is why size, a biophysical variable, is more important than economic development, a socioeconomic variable. The answer here is that the use of economic power in international interactions is usually easily circumvented through the availability of other sources of supply and the capacity of technology to make internal adjustment possible. Hence the use of economic power is likely to lead to economic loss for the states which use it, the thing which caused a decline in its use (Knorr, 1973, p. 196).

2) Development <u>increases</u> the effect of both ED and SZ on international interactions and underdevelopment <u>decreases</u> such effect. The Beta values in table 3.5 are a clear indication of this fact, and this is true for all the states and for both initiated and received behavior. This fact is considered by us as a special case of the Pattern Impact Law (PIL) which states that a) underdevelopment or development

constitutes a pattern whose elements interact with each other and acquire meaning only in relation to the pattern; b) the behavioral effects of any variable are a function of the pattern of variables to which it belongs and with which it interacts; and c) as a consequence the same behavioral effects in two different patterns would require qualitatively similar but quantitatively different causes for them to occur. The third statement is logically deducible from the second. As applied to the two patterns of underdevelopment and development, the PIL must be able to explain why underdevelopment decreases the effect of both ED and SZ on international interactions and why development increases such effect. The answer here is that the underdeveloped states are internally segmented, i.e., they are internally divided along tribal and caste lines, with incohesive elites, amorphous institutions, and weak personalized political centers which are concerned primarily with both consolidating power and staying in power above everything else. As a result their political systems are immobilized (Heegar, 1974, ch. 1, 3, and conclusion), and thus unable to project the impact of internal domestic variables onto external international interactions. On the other hand the developed states are composed of integrated societies, cohesive elites, well established institutions, and strong political centers. Thus their political systems are more responsive to their internal domestic variables and more able to project such variables onto international interactions.

3) The results of model four show the effects of ED and SZ on international interactions within the two contexts of underdevelopment and development. If the PIL is valid, then it follows that such effects

are relative and not absolute in the meaning that they will change if studied within contexts other than the economic context of underdevelopment and development, e.g., religious, political, or cultural contexts, and it is only through comparative contextual studies that the full nature and limitations of the PIL could be discovered.

Tables 3.7 and 3.8 which follow report the results of model five. Because of the failure of model three it became imperative to evade multicolinearity between equivalent and opposing reciprocities in model five. Therefore model five was rewritten as follows:

Model Five

$$I = ED + SZ + R_e$$

$$R = ED + SZ + I_e$$

where all the symbols have the same meanings as mentioned in chapter one. From the results of tables 3.7 and 3.8 we draw the following conclusions.

1) Both the models written with zero order correlations and those written with partial correlations explain a substantial amount of the variability in the dependent variables with the models written with zero order correlations explaining more. But neither of these two types of models could be considered valid because the results of the zero order correlations model are affected by spurious correlations and the results of the partial correlations model are needlessly complicated in the meaning that, depending upon the equation, they explain by three independent variables what either model one or model four could explain by one or two variables. In other words, the partial correlations model

TABLE 3.7

RESULTS OF MODEL FIVE:
ZERO ORDER CORRELATIONS AND REGRESSIONS

	$I = ED + SZ + R_e$			$R = ED + SZ + I_e$		
	R	R^2	Beta*	R	R^2	Beta*
Underdeveloped						
CA	.70	.49	.18,.34,.50	.62	.39	-.14,.01,.61
DE	.91	.82	.09,.04,.88	.90	.82	-.08,.03,.89
PR	.95	.92	.01,-.00,.95	.95	.92	.01,.03,.94
VC	.82	.67	.10,.07,.78	.82	.68	-.09,.11,.76
NM	.70	.50	.12,.14,.62	.72	.51	-.06,.21,.60
MC	.88	.77	.00,.06,.85	.88	.77	-.01,.03,.86
Developed						
CA	.84	.72	.09,.31,.57	.82	.67	-.07,.20,.67
DE	.95	.91	.00,.03,.93	.95	.92	-.01,.07,.90
PR	.97	.94	.08,.03,.93	.97	.94	-.08,.04,.95
VC	.87	.75	-.04,.14,.77	.87	.76	.06,.16,.73
NM	.88	.78	.02,.09,.81	.89	.79	-.02,.17,.77
MC	.89	.79	-.17,.05,.97	.91	.84	.19,.18,.75
Total						
CA	.79	.63	.45,.24,.48	.67	.45	-.28,.07,.72
DE	.93	.86	.04,.03,.90	.93	.86	.00,.03,.91
PR	.96	.93	.07,.00,.94	.96	.93	-.04,.03,.97
VC	.84	.71	.11,.07,.78	.84	.71	-.00,.11,.79
NM	.79	.62	.04,.11,.71	.80	.64	.11,.15,.68
MC	.87	.77	-.16,.03,.87	.88	.78	.18,.06,.84

*The first figure under Beta is for economic development, the second for size, and the third for the reciprocal variable.

TABLE 3.8

RESULTS OF MODEL FIVE:
PARTIAL CORRELATIONS AND REGRESSIONS

	I = ED + SZ + R_e***			R = ED + SZ + I_e***		
	R	R^2	Beta*	R	R^2	Beta*
Underdeveloped						
CA	.70	.49	.18,.34,.50	.62	.39	-.14,.01,.61
DE	.50	.25	.09,.26,.34	.50	.25	-.03,.25,.34
PR	.77	.59	.02,.08,.73	.77	.60	.00,.11,.72
VC	.42	.18	.07,.37,.08	.44	.20	-.04,.40,.22
NM	.49	.24	.13,.33,.23	.52	.27	-.01,.38,.22
MC	.73	.54	-.00,.11,.68	.73	.53	-.01,.08,.69
Developed						
CA	.80	.64	.08,1.00,-.42	.76	.58	.03**,1.04,-.50
DE	.75	.57	-.04,.38,.44	.76	.58	.05,.41,.43
PR	.78	.62	.06,.35,.47	.78	.61	.07,.37,.49
VC	.89	.79	.06**,1.19,-.82	.89	.80	.07**,1.16,-.78
NM	.64	.40	.01,.63,.00	.66	.43	-.01,.66,.00
MC	.70	.49	-.11,.11,.66	.78	.60	.19,.30,.51
Total						
CA	.68	.46	.49,.50,-.18	.44	.20	.20,.50,-.27
DE	.57	.32	.21,.28,.29	.56	.31	.18,.28,.30
PR	.77	.60	.15,.10,.66	.77	.59	.05,.13,.68
VC	.52	.27	.30,.47,-.11	.51	.26	.25,.50,-.12
NM	.52	.27	.22,.38,.11	.55	.30	.26,.40,.11
MC	.72	.52	-.13,.10,.68	.73	.54	.18,.12,.65

*The first figure under Beta is for economic development, the second for size, and the third for the reciprocal variable.

**These three Beta values are not wrong. A Beta over 1 is a mathematical possibility in multiple regression (Cohen and Cohen, 1975, pp. 88-89).

***The models are based on the statistical assumption that both the external original and the external residual variables will have comparable correlations with the internal variables. The results of the zero order and the partial correlations of model one indicate, however, that this assumption is likely to be more satisfied in some interaction categories

Table 3.8 - Continued

and less satisfied in others. Yet the failure of the model to increase its explanatory power beyond those of either models one or four cannot be attributed to this discrepancy in satisfying this statistical assumption, since the model failed to do so in interaction categories in which the assumption is satisfied and in interaction categories in which the assumption is not.

does not have extra explanatory value beyond that of either model one or model four. This is obvious from comparing the R^2 values of the three models as reported on table 3.9 on the following page. Out of 36 equations only 4 showed relevant increases in model five far beyond their values in either model one or model four. There is no statistical mystery about the failure of model five in its partial correlation form. In the interaction categories of CA, NM, and VC the model failed because the reciprocal variable added little to the explanatory power of the internal variables and in the case of MC, DE, and PR the model failed because of the large covariance between the internal explanatory variables and the external explanatory reciprocal variable as indicated by the results of model four in table 3.5

2) In explaining international interactions we are thus left with only two models: model one, which explains only in terms of external variables, and model four, which explains only in terms of internal variables. In making a choice between them we applied the logical principle of Occam's razor, which states that we should choose the simplest possible explanation among several competing but equally powerful explanations. The result was that regardless of whether the behavior is initiated or received, for the underdeveloped states, the developed states, and the total population of states model one is the choice for MC, DE, and PR and model four is the choice for CA, NM, and VC.

3) A look at table 2.3 in chapter two will show that, regardless of whether the dimension is commitment or affect, CA is strong cooperation and MC is strong conflict. But both DE and PR are weak cooperation and both NM and VC are weak conflict. This judgment follows from

TABLE 3.9

RESULTS OF MODELS ONE, FOUR, AND FIVE
IN TERMS OF R^2

	Model One	Model Four	Model Four	Model Five	Model Five
	I and R	I	R	I	R
Underdeveloped					
CA*	.01	.27**	.11	.49	.39
DE	.19	.16	.15	.25	.25
PR	.57	.12	.13	.59	.60
VC	.05	.17	.19	.18	.20
NM	.14	.20	.23	.24	.27
MC	.51	.12	.11	.54	.53
Developed					
CA	.07	.54	.46	.64	.58
DE	.49	.46	.48	.57	.58
PR	.53	.50	.49	.62	.61
VC*	.00	.43	.45	.79	.80
NM	.17	.40	.43	.40	.43
MC	.47	.23	.40	.49	.60
Total					
CA	.00	.43	.15	.46	.20
DE	.22	.25	.25	.32	.31
PR	.57	.27	.25	.60	.59
VC	.02	.26	.25	.27	.26
NM	.12	.26	.29	.27	.30
MC	.49	.12	.16	.52	.54

*Only in these two categories model five has higher R^2 than models one or four.

**The choice models for the different interaction categories are underlined.

comparing the factor loadings belonging to the different interaction categories on both the two dimensions of commitment and affect. Strong cooperation and weak conflict are thus best explainable by internal variables and strong conflict and weak cooperation are thus best explainable by external variables. But if so, then a new theoretical principle, which answers the basic question asked in this study about the relative importance of internal vs. external variables in explaining interactions, emerges. Such principle states that a) there are identical explanations for totally opposing interactions (by "totally opposing" we mean opposing in both quality, i.e., cooperation vs. conflict, and quantity, i.e., strong vs. weak), and b) the violation of such principle will lead to an infinite proliferation of explanatory variables since no set of external variables will be sufficient to explain the variability in strong cooperation and weak conflict and no set of internal variables will be sufficient to explain the variability in strong conflict and weak cooperation. For abbreviation we call this principle the IETOI principle.

4) Like any other empirically derived principle the IETOI needs a theoretical explanation. Such an explanation lies in the concept of change rates. Explanations are a function of change rates. The internal explanatory variables are relatively stable phenomena, i.e., they do not change fast. As such, they cannot be related to events representing fast-changing interaction categories of diplomacy and war, i.e., DE, PR, and MC. Instead such internal explanatory variables could be related only to more stable and prolonged relationships or interactions which exist in the form of aid and basic stable conflicts, i.e., CA, NM,

and VC. On the other hand, external explanatory variables are continuously and ever changing, i.e., they change fast and thus cannot be related to events representing interaction categories requiring relevant continuity in time to be meaningful forms of interaction as CA, NM, and VC. Instead, such external explanatory variables could be related only to the fast and ever-changing interaction categories of war and diplomacy, i.e., MC and DE, PR. And it is these facts which led to the specific nature of the relationships specified by the IETOI principle between internal explanatory variables and both strong cooperation and weak conflict, and between external explanatory variables and both strong conflict and weak cooperation. The evidence that the internal explanatory variables are relatively stable can be established by examining the long-term change rates in the indices of the variables grouped in the concept of economic development and in the concept of size. We were not able to find in the literature data reflecting such long-term changes for every index of economic development and of size, so we examined the data related to only one index of economic development and one index of size and assumed that in each case the change in such indices represents also the change in the other indices grouped with them in economic development and in size. Such an assumption is valid since, as mentioned above in chapter two, the indices of economic development are highly correlated with each other and also the indices of size are highly correlated with each other. For economic development, for the 1950-1969 period, the compound annual percentage change rate for GNP for the underdeveloped states is 5.000, for the developed states is 4.8, and for the total population of states is 4.8 (Hamblin et al., 1973,

pp. 170-171). For size, for the period 1920-1970, the average annual percentage change rate for population is 1.66 for the underdeveloped states, .91 for the developed states, and 1.38 for the total population of states (Bogue, 1969, p. 49). As such it is obvious that the internal explanatory variables change slowly over long periods of time. True, some possible internal explanatory variables like revolutions are fast changing but such destructural variables do not seem to directly affect international interactions. They affect such interactions indirectly through the radical type of the internal political system which they generate (Lentner, 1974, p. 11) and the type of the internal political system of the states is a relatively stable phenomenon. On the other hand, the evidence that the external explanatory variables are fast changing follows from a logical examination of the explanatory variables of negotiation, i.e., DE plus PR, and war, i.e.,MC. Negotiation is a mutual attempt to resolve a conflict peacefully (Ikle, 1967, p. 1) and war is a mutual attempt to resolve a conflict forcefully. Such mutual aspects in both variables imply and necessitate a quick reaction by each state to the moves and actions of the other; otherwise the interaction in each case would not exist and could not be logically characterized as negotiation or war. True, some possible external explanatory variables, e.g., alliances, are relatively stable, but such structural variables do not directly affect international interactions. They affect such interactions indirectly through the state of uncertainty which they create (Midlarsky, 1975, p. 67) and uncertainty by its very definition is an unstable, fast-changing phenomenon.

5) It might be objected here that, because the models used in

our study are incomplete, in the meaning that they do not include all possible internal and external explanatory variables, then the IETOI principle is an overgeneralization, i.e., it is a premature conjecture based on insufficient evidence. The answer to this criticism lies in the fact that model one, i.e., the equivalent reciprocity model, represents the most widespread and the most powerful form of interaction, international and otherwise. Thus the relevant external explanatory variables were given here their full chance to prove themselves and they failed in the case of CA, NM, and VC. This failure implies that it is highly improbable that the other forms of reciprocity which are usually infrequent and weak will be relevant explanatory variables for these three interaction categories. It also implies that the only possible explanatory variables here are the internal ones, although not all possible internal variables are tested and not all which are tested proved to be relevant as in the case of economic development. On the other hand, the addition of both the two internal explanatory variables of ED and SZ to the external explanatory variable of model one has failed to increase its explanatory power in the case of MC, DE, and PR, although these two internal explanatory variables when used alone with these three interaction categories seem to be able to explain, depending upon the interaction category, between one-tenth to one-quarter to one-half of the variability in these three interaction categories. This failure implies that it is highly improbable that the other internal explanatory variables which are usually weaker and less stable than economic development and size will be successful explanatory variables here and that the only possible explanatory variables for these three

interaction categories are the external ones, although not every possible external variable is tested and not all which are tested proved to be important ones as in the case of opposing reciprocity. This argument may be summarized by the following two statements: 1) CA, NM, and VC are best explained by internal variables and MC, DE, and PR, are best explained by external variables; 2) Nature is trying to tell us something and we had better not close our eyes to it. Of course, like any other empirically generated theory, we could be wrong, but truth emerges more often from error than from confusion.

6) With all the new information available now to us as a result of examining the results of the statistical analysis of the data, we are able both to answer the two questions raised at the end of chapter one regarding the independence of models from the pattern of states whose behavior they explain and the specificity of the models in relation to the different categories of international interaction, and to evaluate Sovereignty and Marxism as explanatory theories of international interactions. With regard to the question of the independence of the models from the pattern of the states, the answer is that the models are dependent upon the pattern which they explain, or the PIL would be false, and with regard to the question of the specificity of the models, the answer is that the models are specific in the meaning that certain models are best fitted for some types of international interactions and other models are best fitted for others, or else the IETOI principle would be false. By the same token, we could say that neither Sovereignty nor Marxism has proven itself to be a complete theory of international interactions, although each of them has some explanatory relevance to

only one type of international interactions, but not to the other. Sovereignty is relevant to the fast-changing interaction categories of MC, DE, and PR, and Marxism is relevant to the slow-changing categories of CA, NM, and VC. Such division of labor is not surprising. Sovereignty had accompanied the international system since its beginning when war and diplomacy, i.e., MC and DE, PR, were its main tools and Marxism appeared on the international scene only after the industrial revolutionmade international interactions like economic aid and ideological conflicts, i.e., CA, NM, and VC, possible (Luard, 1976; Morse 1976). The results of any study, however, become more meaningful when compared to, related to, and placed within the context of current relevant knowledge and that is what we intend to do next in chapter four on Interpretations.

CHAPTER FOUR

INTERPRETATIONS

> Theories are not derived from facts.
> They are invented to account for them.
>
> Let us consider variables as interacting through time in a set of processes.
> - Howard H. Lentner

Having discussed our theories and their models, our method and its limitations and our results and their explanations, we turn our attention to comparing our results with those of previous research and relating them to current theoretical and practical issues. The aim of this discussion would be to draw upon current empirical and theoretical contributions in order to enhance our understanding of the results of the study.

Some of the results of previous research support our results and some do not. Whenever lack of support occurred it was due to differences in data, in sampling, in operational definitions, in measurement, and in the statistical models used, and since none of the comparable studies duplicated ours in most or all of these aspects, then any comparisons done in terms of actual statistical values would be misleading if not outright meaningless. Thus all that could be done here is briefly to describe each comparable study, point to whether its results support or do not support ours, and in case of nonsupport point to the methodological differences or deficiencies.

Rummel, using event data belonging to 77 states to investigate the relationship between several internal variables and external conflict in the period of 1955-1957, found what he characterized as low strength correlations between ED and SZ on the one hand and the conflict behavior of the states on the other. His operational definitions of ED and SZ do not exactly agree with, although they also do not contradict, ours. Also his operational definitions of conflict behavior could be easily reconceptualized in terms of our VC, NM, and MC. Our results agree with his as far as ED is concerned. For SZ our correlations are of medium to high strength (Sullivan, 1976, p. 110). East et al., using event data belonging to a nonrandom sample of 33 states to investigate the effects of the type of states on their foreign policy behavior in the period 1959-1968, found that ED is not related to percentage of initiated DE, PR, or MC, that SZ is not related to percentage of initiated CA, PR, or MC, that ED is related to percentage of initiated CA, and that SZ is related to percentage of initiated DE. Our results are not expressed in terms of percentage but in terms of weighted logarithmic frequencies. How much the use of raw percentages and nonrandom sampling has contributed to these results which differ from ours is a matter which cannot be answered. Thus we note the differences but do not consider them as implying a negation of our results (Roseneau, ed., 1974, pp. 269-303). Haas, using data drawn from several resources and 85 states to investigate the relationship between societal development and war during the period 1955-1960, found that such development is related to war. His operational definitions of both societal development and war differ from our operational definitions of economic development and

military conflict, yet his results agree with ours (Haas, 1974, ch. 8). Our results show that in the developed states ED is related to initiating MC. Finally, although we used both Salmore's data and measurements, our results are not directly comparable to his. For his analysis Salmore used only 73 states and only for the period January 1, 1966, to December 31, 1968. We used 132 states for the period January 1, 1966, to August 31, 1969. Salmore's sample is nonrandom and his measures of the dependent variable, i.e., the international interaction categories, are in terms of raw nonweighted frequencies. We used a near population of states and weighted logarithmic frequencies as measures of such interactions. The net result was that Salmore's results underestimated the correlations between ED and CA, DE, PR, between SZ and NM, MC, and overestimated the correlations between ED and MC, and between SZ and CA, DE, PR. Such underestimation and overestimation of correlations is established in relation to the results of our total population of states. Salmore did not study the other two groups of underdeveloped and developed states (Salmore, 1972, pp. 230, 233). The results of previous relevant research are thus neither in complete agreement or complete disagreement with our results. But since we used both a population of data and states and weighted such data, then our results are the ones to be trusted.

Similar but incomplete versions of the ERL are to be found in the literature in the writings of Lévi-Strauss and Dupreel. As stated in chapter three the ERL states that there is a negative relationship between equivalent reciprocity and the strength of cooperation and a positive relationship between the same type of reciprocity and the strength

of conflict. This law contradicts the conclusion drawn by Lévi-Strauss from his anthropological studies. Lévi-Strauss examined reciprocity as related to the exchange of women in primitive societies for the purpose of marriage and ended by stating that a positive relationship exists between equivalent reciprocity and cooperation and a negative relationship exists between such reciprocity and conflict (Lévi-Strauss, 1969, p. 87). Exchange of women in primitive societies for the purpose of marriage, however, is a situation of moderate cooperation, i.e., Lévi-Strauss did not investigate the behavior of equivalent reciprocity in situations of low and high strength cooperation or situations of low, moderate, and high conflict, i.e., his generalizations lack the empirical evidence to support them. Meanwhile our study, which generated the ERL, used data covering the whole spectrum of the strength of both cooperation and conflict, and as such its results are likely to be more valid than those of Lévi-Strauss. The problem with Lévi-Strauss' statements is that they are overgeneralizations of moderate cooperative interactions to every type of interaction. Also in his discussion of conflict systems Dupreel maintained that for such systems to exist they must be symmetrical, i.e., every action must bring a proportionate response in kind, i.e., an equivalent reaction both in quantity and quality, thus leading to a correlation of one between the interactions of the conflict systems (Triska and Finley, 1968, ch. 8). Such theorizing has no empirical data to support it and the empirical evidence generated in our study goes against it. True, within the conflict interaction categories, both the zero order and the partial correlations between the initiated and received behaviors are positive. But it is

only in the case of the zero order correlations which are spurious that such correlations approach the level of one specified by Dupreel's theorem. The partial correlations are far below that level even in their highest level of MC. The problem with Dupreel's theorem is that it has not been empirically tested except in an impressionistic, after-the-fact manner as Triska and Finley did when they applied it to explain global conflict between the USSR and the West (Triska and Finley, 1968, ch. 8).

Currently the underdeveloped states are making demands upon the developed states for a redistribution of the world's wealth. A maldistribution of such wealth between the underdeveloped states and the developed states is seen by the underdeveloped states as a clear sign of the inequalities which are depriving them of real sovereignty and independence. In their opinion, sovereignty thus has not only a legal dimension but also an economic one, and without the economic dimension of sovereignty the legal dimension is meaningless since by itself it cannot give them an equal opportunity to participate in the international system and to move up in its hierarchy (Tucker, 1977). Our study cannot throw any light either on the rationale for these demands or on their rationality. But the study could evaluate their expected effects on the international interactions of the underdeveloped states. If a redistribution of the world's wealth will make the underdeveloped states as wealthy as the developed states, then this would mean according to our operational definitions and measurements of economic development an average increase of over 540 percent in the wealth of the underdeveloped states. This figure is arrived at by dividing the developed

states' statistical mean of 1772 on the economic development variable by the underdeveloped states' statistical mean of 327 on the same variable. But it does not follow automatically that, as a result of this huge instant increase in wealth, the underdeveloped states will have the same impact as the developed states have on international interactions as a result of their advanced economies, an impact which is documented by model four Beta values. The Pattern Impact Law (PIL) which was discovered during our discussion of the results of model four states that the effects of any variable are dependent upon the pattern of variables to which it belongs and with which it interacts and as a result the same effects in different patterns would require varied quantities of the same variable for them to occur. Now since the patterns of underdevelopment and development differ, then an equalization of the economic development variable per se would not result in the same international interactions for both the underdeveloped and the developed states. This result of course is disappointing for the underdeveloped states, but science in this case is not in their side, even if justice is. It should be noted here, however, that all the PIL helped us to see is that things will be different. But the answers to the question about these specific differences cannot be generated through the PIL. Such answers will be generated only through an empirical theory of underdevelopment and development in relation to international interactions. Such a theory is currently lacking, although model four has made a contribution towards it when it showed that underdevelopment decreases the effects of internal variables on international interactions and development increases such effects.

All this, of course, raises a question about the epistemological status of the PIL. The PIL by itself is not an empirical theory of either development or underdevelopment and their relations to international interactions. As a matter of fact it is not an empirical theory of anything. Yet it is a part of a yet-to-be-discovered theory of the effect of development and underdevelopment on international interactions. The PIL would be that part of the theory which refers to the form and not to the content of the analysis carried by such theory and will help relate such a theory to the varied phenomenological realities (Boudon, 1971, ch. 3, 4). By applying the PIL to the phenomenological realities of both development and underdevelopment and their international interactions such a theory is likely to be generated. Such a theory would be relative to the PIL in the meaning that it must reflect its basic syntax (Boudon, 1971, p. 73), which states in essence that both development and underdevelopment and their international interactions constitute different systems. Thus at this stage the PIL is nothing more than a set of postulates used in the context of discovery of such theory, but once such theory becomes known then such postulates would be used in the context of its confirmation (Boudon, 1971, p. 99).

This brief exercise in epistemology was done neither for its own sake, nor to contribute to the theory of development and underdevelopment and their relations to international interactions, which is the proper concern of political economy. Aside from clarifying the epistemological status of the PIL, our aim was to highlight the role played by phenomenological realities in the generation and the confirmation of scientific theories. From our discussion of the epistemological status

of the PIL it is obvious that phenomenological realities are necessary for both the generation and the confirmation of scientific theories. So two relevant questions arise here: one is about the nature of the phenomenological realities of international interactions and the other is about whether such phenomenological realities are actually explained by the theory suggested in our study in the form of the IETOI principle. Phenomenologically speaking international interactions seem to be processes which rise and decline through time and are somehow related to what happens within the states as well as among them. As such, on the face of it, the IETOI principle appears to be an inadequate explanation for such processes. If the IETOI principle aspires to be a general theory of international interaction, then it must be able to account for them in all their varied complexities. Our inability to deal with such varied complexities is the result of the way the WEIS classifies the international interaction events into categories. In order to proceed with the classification the WEIS has to take such events out of their time contexts. Thus a settlement at the end of a war is classified as an event of diplomatic exchange, i.e., DE, and a failure in negotiations is classified as an event of nonmilitary conflict, i.e., NM. As such the integrity, the structure, the system nature, and the time dimension of any international interaction process is dissolved and no empirical theory emerging from analyzing the WEIS data, or any other empirical data set for that matter, would be able to reflect its phenomenological realities since such classification procedure reflects international interactions as a mere collection of events which hang together, not due to a structural logic reflecting them as processes which begin, continue,

and end through time, but hang together due to mere conceptual similarity among them, i.e., the process nature of international interactions is abolished and they are considered as phenomena which merely exist without beginning or end.

In order to remedy this deficiency we took a survey of the available empirical literature on international interactions to see the extent to which its theoretical interpretations both support the IETOI principle and complement it. There are no empirical studies in the literature for the two international interaction categories of VC and NM. Thus we combined them in one category of refusal to negotiate, i.e., denegotiation (DN), and used the historical interpretation of the cold war to represent them. Also little is found in the literature regarding the interpretation of the international interaction category of PR. As such it was combined with DE in one category of negotiations (NG). Such restructuring of international interaction categories does not change the quantitative relations among them. Both CA and MC are still strong categories of cooperation and of conflict and both NG and DN become the weak categories of cooperation and of conflict. What follows is the evidence collected from the empirical literature regarding the theoretical interpretations of the three developmental stages, i.e., the onset, continuation, and end of each of the four international interaction categories of CA, DN, MC, and NG as defined above.

Both internal and external variables seem to be necessary for the onset, i.e., the beginning of international interactions. For CA the economic capacity to give aid and the economic need to receive it are the internal variables and the international struggle between the

SU and the US is the external variables (Knorr, 1973, p. 164; Wall, 1973, p. 9). For DN the SU and US nuclear monopoly and autarkic economy are the internal veriables (Reynolds, 1973, p. 243) and the expansionist policy each of the superpowers assumed the other to be pursuing is the external variables (Gamson and Mediglioni, 1971, pp. 84, 88). For MC the rise of ideological or power values associated with actual or expected material or cultural gains is the internal variable (Randle, 1973, p.10), and the military reaction of the other states in the form of resistance is the external variable. For NG the devaluation of ideological and power values is the internal variables (Randle, 1973, pp. 14, 15), and the willingness of another state to negotiate is the external variables (Ikle, 1967, p. 2).

Either internal or external variables seem to be necessary for the continuation of international interactions. Thus for CA and DN internal variables alone seem to be relevant and for MC and NG external variables alone seem to be relevant. The continuation of CA is dependent upon the continued differentiated capacities and needs of givers and receivers of such aid (Wall, 1973, ch. 2, 8). Also the Cold War lasted for almost a quarter of a century because of the continued economic and nuclear superiority of both the two superpowers in relation to all other states in the international system and the internal economic benefits for the US (Barnet, 1972, p. 190) and the internal political benefits for the SU (Ulam in London, 1974, pp. 43-44) derived for both states from a stable, yet not so militarily hazardous, hostile behavior. On the other hand, the externally oriented stimulus response models were successful in studying military conflict, i.e., MC (Sullivan, 1976, pp. 285-292). Also the success of game theoretical models in the study of the processes of bargaining and

negotiations, i.e., NG, implies that external variables are relevant explanatory variables here since such models basically emphasize action and reaction in relation to the characteristics of the situation (Sullivan, 1976, pp. 272-284). In sum the continuation of international interactions is a function of the stability of only one type of the variables responsible for the onset of such phenomena.

A change in either internal or external variables seems to be required for international interactions to come to an end. For CA and DN only a change in the external variables is required, and for MC and NG only a change in the internal variables is required. Thus CA comes to an end when the recipient states refuse to go along with the donor states on important policy matters (Knorr, 1973, pp. 173-174), and DN also comes to an end when the rise of multipolarity ends the cold war between the SU and the US (Gamson and Medigliani, 1971, p. 119). But the end of MC comes when a devaluation of ideological and power values results in legislative, elite, and public opposition to the war (Randle, 1973, pp. 432-442), and the end of NG comes when enough changes have occurred in the ideological and power values so as either to facilitate or to block the conclusion of an agreement (Randle, 1973, pp. 451, 452; Ikle, 1967, p. 132). In sum the end of international interactions comes when a change occurs in only one type of the variables responsible for the onset of such phenomena.

All the above evidence could be summarized in the following two statements: 1) CA and DN occur as a result of both internal and external variables, continue as a result of the stability of the internal variables, and end as a result of the change in the external variables;

2) MC and NG occur as a result of both internal and external variables, continue as a result of the stability of the external variables, and end as a result of a change in the internal variables. Now if we were to dissolve back the category of DN into VC and NM and dissolve back the category of NG into DE and PR and retrieve back the distinction established in chapter three between the international interaction categories which are best explained internally, i.e., CA, NM, and VC, and those which are best explained externally, i.e., MC, DE, and PR, then two conclusions follow. a) There are identical explanations for the onset, continuation, and end of totally opposing interactions. All international interactions occur as a result of both internal and external variables. But CA, NM, and VC continue as a result of the stability of internal variables and end as a result of a change in external variables; and MC, DE, and PR continue as a result of the stability of external variables and end as a result of change in internal variables. b) The IETOI principle has thus a wider applicability than our study has shown. It is not only valid for explaining the continuation process of international interactions, but also valid for explaining both the onset and the end of such interactions.

Such remarkable capacity of the IETOI principle implies that it is not merely an empirical generalization but also a metatheoretical theory of international interactions, i.e., it is a theory which tells us how to write theories of international interactions. In order to present such theory in a concise manner we need to dispense temporarily with the terms internal and external and replace them with the two terms of proximal and distal. Proximal variables are the variables

responsible for the continuation of international interaction regardless of these variables' being internal or external and distal variables are the variables responsible for the end of such interactions regardless of these variables being internal or external. Once this change is introduced, then we can state the IETOI principle as a metatheory as follows.

1) There are two types of international interactions, those which are slow changing, i.e., CA, NM, and VC, and those which are fast changing, i.e., MC, DE, and PR, and there are identical explanations in terms of internal vs. external explanatory variables for their onset, continuation, and end.

2) The onset of all international interactions is a function of a combination of both distal and proximal variables. The distal variables trigger the proximal variables into action.

3) Their continuation is a function of the stability of the triggered proximal variables. At this stage the distal variables merely put limits on the operation of the proximal variables.

4) Their end is a function of the change in their distal variables. At this stage the proximal variables stop operating in response to such change in the distal variables.

5) The identity of the distal and proximal variables in terms of internal vs. external variables is a function of both the above-mentioned rate of change of international interaction in terms of slow vs. fast, and their developmental status in terms of onset, continuation, or end, with the slow-changing international interactions having internal variables as their proximals and external variables as their distals and the fast-changing international interactions having external variables as their proximals and internal variables as their distals.

6) Violation of the IETOI principle will lead to a proliferation of explanatory variables and would prevent the construction of meaningful scientific theory.

7) Correlations opposite to the IETOI principle could occur as a function of relating the international interaction phenomena at a specific developmental stage, i.e., onset, continuation, or end, to the explanatory variables operating at previous or later stages, but these correlations would be weaker than those occurring according to the IETOI principle.

8) Complete understanding of international interactions would require studying them at all three stages of onset, continuation, and end, and also identifying the relationship between the distal and proximal explanatory variables along these three above-mentioned stages.

9) The IETOI principle does not preclude the use of structural variables, e.g., alliances (Midlarsky, 1975, Ch. 3) or destructural variables, e.g., internal conflict (Wilkenfeld, 1973, Ch. 3, 4, 5, 6, 9) but assumes that their use would not violate it.

In sum, in its enlarged form, the IETOI states that <u>international interactions occur as a result of a combination of distal and proximal variables, continue as a result of the stability of their proximal variables, and end as a result of a change in their distal variables</u>. The IETOI principle is thus able both to describe and to account for the process nature and the time dimension of the phenomenological realities of international interactions without resorting to any dynamic concepts. It does so by stabilizing the process and the time dimension of such interactions at the three static points of onset, continuation, and end, and by separating itself from the elementary

classification of the explanatory variables of international interactions in terms of being internal or external and instead taking into account a more abstract description of them in terms of being distal or proximal. At this point, the enlarged form of the IETOI principle has certainly a heuristic value, since its application will lead us to the type of explanatory variables in terms of internal vs. external, relevant to an international interaction category in terms of both its changing rate and its developmental stage. But once the full explanatory theory of all international interactions at all their developmental stages becomes known, then the heuristic value and the metatheoretical nature of the IETOI principle would decline and disappear and the IETOI principle would be a general theory of international interactions since it is likely to serve as a unifying principle for the many yet-to-be-discovered, empirical generalizations among the independent and dependent variables of international interactions.

Time, the dimension within which changes and processes occur, affects not only international interactions, but also the international society as a whole. Some authors claim that the contemporary international society is changing to a new one (Morse, 1976; Luard, 1976). If this is so then a question about the time limit of the generalizations and theories arrived at in this study arises, i.e., will such generalizations and theories be applicable to a new international society which differs more or less from the contemporary one? The nature of the new international society is not yet clearly defined. Luard, who elaborated on this issue more than any other theoretician, suggested four possible types of future international societies.

1) A transnational society which is characterized by the primacy of international economics over international politics and a decline in the authority of the states due to such transnational organizations taking over significant parts of their functions. In this society international politics would be politics among transnational organizations.

2) An international society which is characterized by the states becoming incapable of dealing with their internal problems and thus significant parts of their authorities are gradually transferred to existing and new international organizations. In this society international politics would be the politics of bargaining and negotiation within such international organizations.

3) A sphere of influence society which is characterized by superpower dominance. Only superpowers would be able to stand to the forces of change and the rest of the world would be divided among them, each superpower with its own sphere of influence. In this society international politics would be the politics of superpowers.

4) A regions society which is characterized by a series of associations of states leading finally to regional integrations within such associations. In this society international politics would be the politics among such regions (Luard, 1976, ch. 14).

To sum up all of these four possible international societies, take either one of the following two positions regarding the state: 1) states are going to stay but be subject to the control of superpowers or regional organizations; 2) states are going to lose some of their functions to transnational or international organizations.[1] And the relevant

question as far as the results of our study are concerned is whether any or all of these new possible four international societies will drastically change or end international interactions as we know them.

The basic elements of the contemporary international society are two: 1) several states competing with each other for security, influend, and control, 2) such competition occurring within a decentralized system, i.e., a system in which there is no higher authority to guarantee the security of each state and settle the disputes among such states over influence and control. Both the spheres of influence and the regions societies would keep this above-mentioned essential character of the contemporary international society, only they will reduce drastically the number of its units. Thus unless we adopt the absurd opinion to the effect that the generalizations and theories discovered in this study are a function of the number of units used in the analysis or that the laws governing the interactions of super and regional powers differ from those governing the interactions of all other states, then the realization of any of the above-mentioned two international societies of spheres of influence and regions will not change the basic character of international interactions as we know it. Also, both the other two societies of transnational and international organizations speak about the expected decline in the states' functions and authorities, but they never admit that the states are going to disappear and be replaced by such transnational or international organizations. They merely say that states will have less functions to perform. Of course, the rise of transnational or international organizations might lead to the decline or the disappearance of certain forms of international interactions, e.g.,

MC and CA or to an increase in others, e.g., DE and NM, but this does not mean that the basic character of international interactions as we know it is going to change. A quantitative decline in any phenomenon does not imply logically or empirically a qualitative change in its basic nature. In sum, no matter which type of society the contemporary international society is likely to evolve to, international interactions are likely to remain interactions in a decentralized society, and thus the generalizations and theories established in this study are not limited to the present structure of the international system.

The above-mentioned three laws of ERL, PIL, and IETOI were generated within a special methodological context, i.e., the linear simple and multiple regression model, and as we saw in chapter two there was no total fit between the characteristics of the data used and the mathematical requirements of the model. Problems of spuriousness, validity, reliability, aggregation, incompleteness, and multicolinearity were expected in advance. The execution of the study, however, has pointed to a new set of both methodological and theoretical problems which further research must contend with before any further theoretically significant advances could be made and a discussion of these problems will move us to chapter five in Implications.

CHAPTER FIVE

IMPLICATIONS

> The results of any study are less important than the problems it opens for research. After all the critics will always say that should the author have been more intelligent, then he should have anticipated these results to be self-evident and there would be no need for the study in the first place.

Two types of implications are generated by the research reported in this study: one methodological and one theoretical. The methodological implications are related to the three issues of 1) theoretically generated operational definitions of the independent variables of model four, 2) the proper explanation of received behavior, and 3) the failure of the WEIS data set to generate an international interaction category of integration. The theoretical implications are related to the three issues of 1) generating new types of reciprocity other than those of equivalent and opposing reciprocities and using them as explanatory variables in model one, 2) introducing new internal explanatory variables in model four, and 3) studying and identifying the relationships between the distal and proximal explanatory variables, i.e., between the distal and the proximal, between the distal and the change in the distal, and between the proximal and the change in the distal. In what follows we will discuss in some detail these six issues pointing to

their theoretical importance and what theoretical gains could be expected from them.

The operational definitions of the two variables of ED and of SZ were statistically generated, i.e., Salmore correlated a large number of indices which were thought to reflect each of these two variables and the indices which correlated highly with each other were taken as operational definitions of each of these two variables. Two deficiencies occurred here: 1) the researcher is a victim of the sample used, and a different sample of states might have generated a different set of correlations; 2) this procedure is a source of redundancy among the independent variables because some of the indices which are statistically relevant to one independent variable might prove to be also statistically relevant to another, and if these indices were to be included in the operational definitions of both variables then redundancy effects in the form of uniformly low Betas are sure to occur. To evade all these problems which are sure to confound the results of any investigations of international interactions, operational definitions of the independent variables should be generated theoretically and not statistically. This could be done through, first, providing theoretical definitions of the independent variables and, second, logically deducing from such definitions the empirical indicators, their indices, and how these indices should be combined. These two steps are required to generate both meaningful and theoretically sound operational definitions. Without theoretical definitions the indices remain too specific and without indices the theoretical definitions remain too diffuse (Hage, 1972, p. 67). Both Salmore's and our failure to adopt this procedure

might create severe problems of redundancy among the independent variables if we want to introduce an independent explanatory variable representing military power whose theoretical definition implies indices of military manpower and GNP (Knorr, 1973, p. 95). Both of these indices are already included in the above-mentioned statistically generated definitions of size (for military manpower) and of economic development (for GNP) and as such redundancy among the independent variables is sure to follow if these two indices were used for military power. To evade such redundancy we either have to drop these two indices from the operational definitions of size and economic development, the thing which will make such operational definitions deficient, or dispense with the concept of military power as an explanatory variable. Both of these two choices are, of course, illogical and thus unacceptable, and the only way out is through theoretically generated operational definitions along the above-mentioned two steps.

The results achieved by our study for the received behavior of the states almost duplicate those of the initiated behavior and thus, on the face of it, are puzzling and require further examination. The relevant question here is, of course, why is this so? For model one this occurred because the received behavior of the states equals in quantity that of the initiated behavior of such states. This is obvious for most of the international interaction categories for the three groups of the states, from the high zero order correlations of model one reported in table 3.1 in chapter three. But for models four and five the duplication of results is theoretically unacceptable. Two theoretical possibilities exist. 1) In responding to each other the states take

into account not only the behavior responded to but also the internal characteristics of the states which initiated it. To test this possibility we need to regress the received behavior on the internal characteristics of the states which received it. This is done already in models four and five, and its results are, as we said above, puzzling and thus unacceptable. 2) In responding to each other the states take into account not only the behavior responded to but also their own internal characteristics. To test this possibility we need to regress the received behavior on the combined internal characteristics of the states which initiated it. This was not tested in our study. But if it is done, then the results for the received behavior of the states are almost certain not to duplicate those of the initiated. The problem of the received behavior has never been explored before in the literature on international interactions. Received behavior is a new conceptualization of such interactions and it deserves more attention than we can devote to it in this study. Such new conceptualization has been legitimized by the explanatory success of model one in which received behavior provided substantial explanation for the three international interaction categories of MC, DE, and PR.

The results of any study are to some extent a function of the nature of its data and our results are no exception. The WEIS data, which is the data set used in this study, has excluded all economic and social transaction data among the states on the basis that such data is nonpolitical and that it is readily available in aggregate form in official publications. This, of course, has its obvious results reflected in the lack of an international interaction category of integration.

The exclusion by McClelland of economic and social transaction data among the states on the basis that they are nonpolitical because its actors do not aim at influencing each other's behavior is too restrictive. Lots of economic and social behavior has political aims and lots of political events have economic and social aims. All this, of course, raises suspicions about the stability of the results achieved from a principal factor analysis of a data set which cannot be logically or theoretically considered as reflecting all interaction phenomena among the states. As such we might speculate here about the effects of including transaction data upon our categorization of international interactions. A look at table 2.3 in chapter two clearly shows that there is little difference in the factor loadings of both DE and PR on both the two dimensions of commitment and affect, and as such for all practical and theoretical purposes these two categories could be grouped together in one category of Negotiation (Ng). With the addition of transaction data a new international interaction category is likely to emerge, i.e., integration (IN). As such a new international interaction category set would be composed of the following six categories: CA, IN, Ng, VC, NM, and MC. The first three categories are categories of cooperation and the last three categories are categories of conflict. The first and the last categories are strong categories and the second through the fifth categories are weak categories, i.e., the same classifications which generated the concept of "Totally Opposing Interactions" would still be valid under the new classification. As such both the addition of the new IN international interaction category and the integration of both DE and PR in the new category of Ng are

likely to upset neither the IETOI principle nor the ERL. All this speculation is based on two assumptions: 1) that the new IN interaction category will reflect moderate cooperation, and 2) that the new Ng interaction category would reflect low cooperation. Both of these two assumptions seem reasonable to make. Economic and social transactions are certainly less cooperative than outright giving or receiving in the form of economic and military aid, i.e., CA, and negotiations are less cooperative than economic and social transactions since they logically imply the previous existence of conflict which is negotiated (Ikle, 1967, p. 2). Finally, we do not recognize anything in the new classification of the international interaction categories which could upset the PIL.

Only two types out of four possible types of reciprocal interactions were examined in this study: equivalent and opposing reciprocities. Two other possible types exist. They are generalized and nonequivalent reciprocities. This fourfold classification of reciprocities is based on classifying the six international interaction categories simultaneously along both the qualitative dimension of cooperation and conflict and the quantitative dimensions of strong, moderate, and weak. In the equivalent reciprocity of model one every interaction category is regressed on exactly its equivalent. In the opposing reciprocity of model two every interaction category is regressed on its qualitative opposite, holding their quantitative strength stable. In models written for generalized reciprocity every interaction category would be regressed on either or both of two other interaction categories which differ from it quantitatively but are similar to it qualitatively. Finally, in

nonequivalent reciprocity every interaction category would be regressed on either or both of two other interaction categories which differ from it both qualitatively and quantitatively. Table 5.1 which follows gives the characteristics of all four possible types of reciprocities and their operational definitions in terms of the current and the above-mentioned suggested classification of the international interaction categories. Here we have two expectations.

1) We would expect that nonequivalent reciprocity, like opposing reciprocity, is not likely to meet with much success. In opposing reciprocity the two interaction categories regressed on each other differ only qualitatively and in nonequivalent reciprocity such categories would differ both qualitatively and quantitatively and given the results of model two it is highly unlikely that a model reflecting nonequivalent reciprocity will be successful. However, it should be noted here that the results of model two are done with the classification of international interaction events in the six categories of CA, DE, PR, VC, NM, and MC. What the results are likely to be with the new above-mentioned suggested classification of such events into the six categories of CA, IN, Ng, VC, NM, and MC is anybody's guess.

2) We would also expect that generalized reciprocity, like equivalent reciprocity, would result in a meaningful model. In equivalent reciprocity the two interaction categories regressed on each other are similar both qualitatively and quantitatively and in generalized reciprocity such categories differ only quantitatively but not qualitatively. Now since it is reasonable to assume that any type of international interaction, whether it is cooperation or conflict, would either require

TABLE 5.1

TYPES OF RECIPROCITIES AND THEIR OPERATIONAL DEFINITIONS

Type of Reciprocity	Qualitative Similarity between the Variables	Quantitative Similarity between the Variables	All Possible Relations: Current Classification	All Possible Relations: New Classification
Equivalent	Yes	Yes	CA - CA DE - DE PR - PR VC - VC NM - NM MC - MC	CA - CA IN - IN Ng - Ng VC - VC NM - NM MC - MC
Opposing	No	Yes	CA - MC DE - NM PR - VC VC - PR NM - DE MC - CA	CA - MC IN - NM Ng - VC VC - Ng NM - IN MC - CA
Generalized	Yes	No	CA - DE/PR DE - CA/PR PR - CA/DE VC - NM/MC NM - VC/MC MC - VC/NM	CA - IN/Ng IN - CA/Ng Ng - CA/IN VC - NM/MC NM - VC/MC MC - VC/NM
Nonequivalent	No	No	CA - VC/NM DE - VC/MC PR - NM/MC VC - DE/CA NM - PR/CA MC - PR/DP	CA - VC/NM IN - VC/MC Ng - NM/MC VC - IN/CA NM - Ng/CA MC - Ng/IN

or permit the exercise of qualitatively related other types of interactions then the prospects for a successful and meaningful generalized reciprocity model are good regardless of whether the current or the new classification of international interaction categories is adopted. And if a generalized reciprocity model is realized, then a new model combining both equivalent and generalized reciprocities could be written as follows:

$$I = R_e + R_{g1} + R_{g2}$$
$$R = I_e + I_{g1} + I_{g2}$$

where I, R, I_e, and R_e have the same meaning as in model one and R_{g1} and R_{g2}, I_{g1} and I_{g2} mean received and initiated generalized first and second interaction categories. Now since the equivalent reciprocity of model one has explained between one-quarter and one-half of the variability in the dependent variables (depending upon the international interaction category), then assuming the success of a generalized reciprocity model, the prospects for a near complete explanation for the externally explained international interaction categories of MC, DE, and PR might be finally at hand.

But if different types of reciprocities could possibly help provide a complete model for explaining the above-mentioned externally explained interaction categories, what internal independent variables could be invoked to help complete the explanation of the internally explained international interaction categories of CA, NM, and VC? Two prospects here are military power and the type of the political system of the state. Military power influences international interactions

(Holsti, 1972, p. 307). The relevant question here is what interactions and by how much? There are no studies in the literature which could throw some light on this question. One possible explanation for such neglect is the observed devaluation of military power as a political tool and the consequent decline in its actual use. This occurred because of the rising cost of the use of such power and the decline in the value of its returns in relation to internal investments returns (Knorr, 1973, pp. 196, 117). On the other hand, the military expenditures of all states keep rising year after year even when inflation is taken into account (Rosen and Jones, 1974, pp. 98, 186). So if military power is not going to be used by the states in military conflicts, i.e., MC, an externally explained interaction category, is it possible if not probable that the aims and use of such power are related to the internally explained international interaction categories of CA, NM, and VC. For the CA interaction category military power is certainly relevant to initiating military aid and, as for the two other interaction categories of NM and VC, which could be grouped together as we have previously shown in a category of denegotiation, i.e., DN, military power certainly could support a position of denegotiation of conflicts between the states (Reynolds, 1973, p. 243).

On the other hand, the political system of the state has been shown by some researchers to be related, but only to the internally explained international interaction categories of CA, NM, and VC (Salmore, 1972, p. 213). The type of political system studied here was along the open-closed, i.e., the democratic-totalitarian, dimension. Other political dimensions which also could be relevant here include

the liberal-authoritarian dimension and the radical-conservative dimension (Blondel, 1969, pp. 37-42). The type of political system is usually measured in ordinal scales which in turn are treated as interval scales, thus permitting the application of the regression model (Salmore, 1972, p. 210). Such procedure, however, is mathematically wrong and leads to dubious results. Attempts should be made from the start to identify indices which could be represented by at least interval scales. The ordinal scales lower the variability among the states on the measured independent variable and thus either increase the size of the correlation and regression coefficients if the dependent international interaction categories happen to be of low variability, or decrease such coefficients if such dependent variables happen to be of high variability. In Salmore's work such procedure contributed to questionable effects in his models since it led to high correlations between the two independent variables of economic development and the open-closed political dimension because of the low variability among the states used in his sample, since most of them are developed or semi-developed states.

In studying the relationships between the distal and proximal variables, the relevant question here is one of identifying the time lags between the distal variables and the triggering of the proximal variables. In order to answer this question we need to do historical surveys directed at the length of such time lags and the different internal and external variables affecting such lags. In advance of such surveys four hypotheses may be offered: 1) the stronger the states involved, in relation to other states in the international system, the

shorter such time lags; 2) the more balanced the power of the states involved in relation to each other the longer such time lags; 3) bipolarity of the international system shortens such time lags; 4) multipolarity of the system lengthens such time lags. The first and the third hypotheses are applicable to internally explainable international interactions of CA, NM, and VC. The second and the fourth hypotheses are applicable to the externally explainable international interactions of MC, DE, and PR.

In studying the relationship between the stability of the proximal variables and the change in the distal variables, historical surveys could also identify the time lags between them and the following hypothesis could be tested: Both the strength of the proximal variables and the balance of power among the states involved on such variables have a positive relationship to time lags in MC, DE, and PR, and a negative relationship to such lags in CA, NM, and VC.

In studying the relationships between the strength of the distal variables and later changes in them, the relevant question here is, again, one of identifying the time lags between the rise and decline in the distal variables. Again historical surveys are needed here to detect the length of such time lags and the different internal and external variables which affect them. In advance of such surveys four hypotheses may be offered: 1) the stronger the states involved, in relation to other states in the system, the longer such time lags; 2) the more balanced the power of the states involved in relation to each other, the shorter such time lags; 3) bipolarity of the international system

lengthens such time lags; 4) multipolarity of the international system shortens such time lags. The first and the third hypotheses are applicable to internally explainable international interactions of CA, NM, and VC. The second and the fourth hypothese are applicable to the externally explainable international interactions of MC, DE, and PR.

It is obvious from all the above-mentioned nine hypotheses that time lags are a function of whether the international interaction involved is externally or internally explained with opposite roles played by such external and internal explanatory variables in the two groups of international interactions. Such opposite roles resulted from the differential roles played by such external and internal variables in explaining the three stages of onset, continuation, and end related to international interactions as was established by the IETOI principle in chapter four.

Chapter two of our study has shown the methodological problems resulting from lack of fit between the data characteristics and the mathematical requirements of the linear multiple regression mode. This chapter has pointed to a new set of methodological requirements which must be satisfied before any theoretically relevant advances could be made in the explanation of international interactions. There is no alternative before us but to pursue the research along the above-mentioned suggested lines, although it is obvious that huge efforts are required before any substantial results could be achieved. The failure of the two existing theories of international politics, i.e., realism and systems theory, to generate new hypotheses for further research is too well documented in the literature to be repeated here (Hoffman, 1960;

Reynolds, 1973, ch. 2). Thus the only way a scientific theory of international interactions could be achieved would be along the lines pursued in this study, i.e., through an interplay among data, method, and empirical generalizations playing the role of theories. Method applied to data to test hypotheses deduced from vague theories like sovereignty or marxism, generates empirical generalizations whose limitations soon become evident when compared with our phenomenological realities of international interactions, thus generating a whole new cycle of scientific activities in the form of new hypotheses tested by more refined data and methods, and so on. Finally a large number of empirical generalizations will emerge and could be transformed to scientific laws when integrated in a general theory of international interactions and then such theory would replace the current vague theories of realism and systems theory as the theory of international interactions. Other research workers before us have tried to generate such empirical generalizations in relation to every possible explanatory variable for international interactions (McGowan and Shapiro, 1973). Yet because of problems of sampling, measurement, choosing the wrong statistical model, and lack of respect for the phenomenological realities of international interactions, for almost every empirical generalization which was established another empirical generalization was found to contradict it (McGowan and Shapiro, 1973). In our study populations are used instead of samples, weighted measurements are used instead of raw frequencies counts, the appropriate statistical model is applied, and a total respect for the phenomenological realities of international interactions is observed. As such the probability of our findings being upset by other research is quite remote and on this optimistic note our study ends.

CHAPTER SIX

SUMMARY

> Simple and obvious things like sex, money, and international politics do not need scientific explanations. When scientifically explained, they become complex, obscure, and, more important, much less interesting.

In order to evaluate the relative role played by internal vs. external variables in explaining the different types of international interactions, five regression models were generated from sovereignty theory and marxism. Simple and multiple linear regression were applied to both 1965 data of economic development and size used as internal variables and to 1966-1969 reciprocal international interactions used as external variables. There was a lack of fit between the mathematical requirements of the linear regression model and the characteristics of the above-mentioned used data, the thing which prevented a valid and reliable estimation of the equations regression coefficients. Yet it was felt that such lack of fit is not serious enough to prevent the generation of theoretically relevant results. Three such results were generated in the form of 1) the Equivalent Reciprocity Law which states that there is a negative relationship between such reciprocity and the strength of cooperation and that there is a positive relationship between such reciprocity and the strength of conflict, 2) the Pattern Impact Law which emphasizes the concept of pattern, structure, or

system and thus infers and demonstrates that the behavioral effects of any independent variable are not independent from the pattern of variables to which it belongs and with which it interacts, 3) the Principle of Identical Explanation of Totally Opposing Interactions, which states that regardless of their developmental stage both strong cooperation and weak conflict are explained by the same type of variables and that both strong conflict and weak cooperation are explained also by another type of variable. Thus regarding the basic question asked in this study about the relative importance of internal vs. external variables in explaining international interactions, the answer is that each of them is relevant but to a different type of international interaction at a different developmental stage.

The results demonstrated for the first time the importance of the received behavior of the states as an explanatory variable and generated a heuristic metatheoretical theory of international interactions, i.e., a theory which tells us how to write theories explaining such interactions. As the same time the results pointed to some of the limitations inherent in pure empiricism in the form of the limitation the data set puts on what is to be investigated and the pure static aspect it imposes on theorizing. More important, the results have shown international interactions to be lawful phenomena whose behavior lacks that mysterious impression which they always make on us.

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