Research Note

COGNITIVE MAPS OF THREE LATIN AMERICAN POLICY MAKERS

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I

THE main premise of this paper is that the domestic and foreign policies of Latin American states are strongly influenced by the belief systems of their domestic and foreign policy elites.[1] Specifically, I will assume that beliefs about the causal relationships among conceptual variables, called "cognitive maps" here,[2] which constitute a

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[1] Some of the reasons for adopting this premise may be summarized as follows: (a) Latin American nations, like other developing nations, are less constrained in their actions by mass public opinion or by bureaucracies than are developed nations; (b) their leaders usually adopt a distinctive style of policy making that emphasizes the fit between policies and ideology which is often lacking in the incrementalist politics of developed countries; (c) whenever there is a change in leadership in Latin American nations, there is usually a change in domestic and foreign policies which reflects the beliefs of the new leaders. In support of point (a), I would simply argue that there are very few liberal democratic regimes surviving in Latin America at the moment, and that if there were much bureaucratic politics in Latin America, a literature about it would have developed by now. The only works that I know of which discuss the constraining effects of interagency conflict or bargaining on state politics in Latin America are Peter S. Cleaves, *Bureaucratic Politics and Administration in Chile* (Berkeley: University of California Press 1974), and Franklin Tugwell, *The Politics of Oil in Venezuela* (Stanford: Stanford University Press 1975). The idea, point (b), that beliefs and ideology are particularly important in determining the policies of Latin American elites—because of the lack of public pressures and the distinctive problem-solving style of those elites—was first discussed by Albert O. Hirschman, in *Journeys Toward Progress* (New York: Twentieth Century Fund 1961), 231. In support of point (c), I could cite the cases of the change in foreign policy which accompanied the elections of Jânio Quadros in Brazil, Salvador Allende in Chile, Rafael Caldera in Venezuela, and Juan Perón in Argentina. I could also cite many cases of changes in policy produced by extralegal changes in regimes. This matter has not received sufficient research, however, and it remains to be seen whether changes in policy can best be explained by the changes in belief systems that sometimes accompany changes in government personnel, or by other factors.

[2] I will define cognitive maps as sets of causal beliefs or assertions, though some scholars use the term to stand for general beliefs about the fundamental characteristics of some aspect of a physical or social environment, whether or not such beliefs are causal. I am indebted to Ole Holsti for this point. Other scholars are interested in sets of causal assertions as they are used in discussions and arguments among groups of

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rather limited subset of the broader belief systems of these individuals, can help to explain—and perhaps even predict—their policy choices.[3] It is possible that, in studying these cognitive maps, we may learn something about cognition in general. In this introductory section, I will try to explain what a cognitive map is, how one is obtained through coding of documents, and why I chose to study the cognitive maps of Latin American elites. In subsequent sections, I will present detailed analyses of cognitive maps of three important individuals: (1) Carlos Andrés Pérez, the current President of Venezuela; (2) Roberto de Oliveira Campos, Finance Minister of Brazil from 1964 to 1967 and colleague of succeeding Finance Ministers (Antonio Delfim Netto and Mario Henrique Simonsen); and (3) General Aurelio de Lyra Tavares, the Brazilian Minister of War from March 1967 to August 1969. I will then compare the three maps in terms of a number of characteristics to be introduced below. I will conclude with a discussion of the advantages and disadvantages of studying cognitive maps.

A. COGNITIVE MAPS

Every individual's perceptions (and actions based on those perceptions) are filtered through clusters of acquired concepts and beliefs. The process in which this is accomplished is called cognition. A belief system is a set of interrelated beliefs that help the individual to make sense out of what might otherwise be a confusing array of signals from his environment. *A cognitive map is a representation of the causal beliefs or assertions of a specific individual.* To the extent that the cognitive map represents beliefs, it may be considered to be a subset of the individual's belief system.

Causal beliefs here are assumed to take one of the following simple forms: (1) an increase in A produces an increase in B (represented graphically as $A \xrightarrow{+} B$), or (2) an increase in A produces a decrease in B ($A \xrightarrow{-} B$).[4] Because people do not always speak in such a

policy makers. Such sets are more correctly called "rhetorical maps," because they do not assume that the individuals *believe* the causal assertions that they make in order to persuade others to go along with a particular policy. See Robert Axelrod, "Argumentation in Foreign Policy Decision Making," paper delivered at the Annual Meeting of the American Political Science Association, Chicago, September 1976.

[3] In other words, I am not denying the probable effects of noncognitive variables on the policy choices of individuals; but I am arguing, as Fred Greenstein does in *Personality and Politics* (New York: Norton 1975), xvii-xix, that the behavior of political actors cannot always be explained in terms of "situational" determinants and that therefore psychological explanations may sometimes be useful.

[4] Other types of causal beliefs may be assumed to exist and may be incorporated into the empirical study of cognitive maps. See Hart, "Comparative Cognition: Politics of International Control of the Oceans," in Robert Axelrod, ed., *The Structure of Decision* (Princeton: Princeton University Press 1976).

simple causal language, it is necessary to establish elaborate coding rules for the translation of normal language into causal assertions. Since this has already been accomplished by Robert Axelrod and his students and associates in such a way as to produce a high level of intercoder reliability, I will use his rules here.[5]

Cognitive maps may be observed and recorded through a variety of means. The main ones are: (a) systematic coding of documents representing the writings or statements of the individual; (b) coding of verbatim transcripts of private meetings in which the individual is a participant; and (c) the eliciting of causal beliefs through questionnaires or interviews. The advantages of the first method are obvious: documents representing an individual's ideas and beliefs are usually easy to find; there is often a series of such documents that may help one to trace changes in beliefs over time; and, because the individual is usually writing for a general audience, the causal assertions are likely to represent defensible—if not always sincere—beliefs.

Of course, there are always temptations for political elites to misrepresent their beliefs. Whether the motive is to conceal their "true" aims or to be better able to persuade others, the effect is the same. Axelrod maintains that political elites are more likely to reveal their beliefs in private decision-making contexts, and therefore argues for the superiority of transcripts over public documents as a source for cognitive maps. Yet, both methods are vulnerable to insincerity, and transcripts are much rarer than documents. The problem of insincerity also exists for questionnaires and interviews, but in this case there is at least the possibility of discovering it through the insertion of certain types of items or through the face-to-face encounters that are only possible in interviews. The best approach would be to use as many means as possible. In this study, I must regrettably rely on documents only. I plan, however, to supplement this analysis with interview data in later stages of my research.

B. THE CODING OF COGNITIVE MAPS

In order to demonstrate how it is possible to estimate the cognitive map of an individual from his or her writings, I will present a sample coding for the first individual to be analyzed below, Carlos Andrés Pérez. The following paragraph is taken from President Pérez's speech to the Venezuelan people on August 29, 1975, after signing the bill that nationalized the petroleum industry.

[5] See Margaret Wrightson, "The Documentary Coding Method," in Axelrod (fn. 4).

(A) The enterprise we propose to undertake has the colossal dimensions required for the Venezuela of today and of the future. It
(B) demands the joint effort of all Venezuelans. It is not only a matter of government decisions, nor is it only a legal and practical procedure for the conveyance of the ownership of the industry. Beyond that it is our true responsibility for the effective management (C) of an industry which operates in areas that were never
(D) before covered by Venezuelans, by means of a state organization (E) which we recognize to be clumsy and inefficient as well as still lacking in adequate public spirit which is essential to success.[6]

The first step in the coding of a document is to identify the conceptual variables that its author has emphasized. That is done by underlining key words and labelling them with capital letters. Usually each word or phrase so labelled has a two-letter code, the first letter indicating the page on which it was found, and the second letter indicating its sequential order on that page. In this example I have simply used a single letter.

The second step is to list the conceptual variables. Some rewording of the variables is usually required, but the phrasing should remain as close as possible to the original:

LIST OF VARIABLES

A = the enterprise
B = joint effort of all Venezuelans
C = effective management of the nationalized industry
D = operation of the industry in areas which were never before covered by Venezuelans
E = operation of the industry by means of a state organization

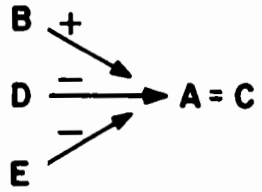
The third step is to identify the causal relationships explicitly stated or implied by the author. This is usually done in the margins of a photocopy of the document being coded. Here I will simply list the relevant statements.

LIST OF CAUSAL STATEMENTS	CODED
1. A . . . "demands" . . . B (B is necessary for A)	$B \xrightarrow{+} A$
2. D may have a negative effect on C (implicit)	$D \xrightarrow{-} C$
3. E may have a negative effect on C (since E is "clumsy and inefficient")	$E \xrightarrow{-} C$

One then looks for possible direct correspondences between variables. In this case it seems that "the enterprise" (A) and "the efficient management of the nationalized industry" (C) are really the same variable,

[6] *Towards a Great Venezuela: Nationalization of the Oil Industry* (Caracas: Oficina Central de Información 1975), 11.

stated in different words. Therefore, the final coding of the paragraph, subject to revisions that may be suggested by its context in the entire document, would be as follows:

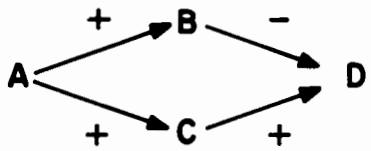


C. COMPARISON OF COGNITIVE MAPS

Based on the form of the map and on the document itself, it is usually possible to classify all the conceptual variables according to the following typology: (1) *utility* variables; (2) *goal* variables; (3) *policy* variables; and (4) *peripheral* variables. Utility variables exist in every cognitive map. Any time an individual places a positive evaluation on a certain value of a variable (as Carlos Andrés Pérez does on the efficient management of the nationalized oil industry, for example), one can assume a direct positive effect of that variable on a utility variable. In the case of President Pérez, the utility variable concerns the welfare of all Venezuelans, but utility variables may also concern the welfare of individuals and collectivities other than the state. Goal variables are variables that directly effect the utility variables, without mediation by other variables. Policy variables are variables that the individual seems to designate as being susceptible to control or manipulation by his government. Generally speaking, policy variables are not directly connected with utility variables, but they usually are connected indirectly through their effects on goal variables. Peripheral variables are variables which are not utility, goal, or policy variables. Peripheral variables come in three varieties: (1) variables that are directly or indirectly affected by policies, but that do not affect policies; (2) variables that directly or indirectly affect policy variables, but are not affected by policies; and (3) variables that affect, and are affected by, policy variables. One possible way to compare cognitive maps is in terms of the frequency with which utility, goal, policy, and peripheral variables appear in the maps.

Several additional properties of cognitive maps concern the nature of the causal *paths*, or chains of causation that follow the direction of the effects without going through any variable more than once in the individual's cognitive map. Since there are only two main types of

causal assertions, there are also only two types of paths: *positive* and *negative*. Positive paths contain an even number of negative assertions; negative paths contain an odd number. Thus, in the map shown below, the path from A to D which goes through B is negative, and the path from A to D which goes through C is positive. The path from A to D



going through B is negative because an increase in A produces an increase in B, which in turn produces a decrease in D. Therefore, an increase in A produces (indirectly through B) a decrease in D. The sign of the path tells us the nature of the indirect relationship between the variables at the end points of the path.

An important property of cognitive maps is path-balance, or the degree to which parallel paths between pairs of variables have the same sign. In the example above, the signs of the two paths from A to D are not the same. Thus, we would say that the map is not path-balanced. The importance of path-balance lies in its relationship to the consistency between policy choices and cognitive maps. A *consistent policy choice* is defined as the setting of a policy variable to a certain value so that all causal effects, direct or indirect, have a positive effect on utility. For a policy choice to be consistent, the paths that connect it to the utility variables must be balanced. Path-balance is therefore a prerequisite for consistency as defined above. Several scholars have hypothesized that decision makers will prefer to make consistent policy choices of the sort defined here.[7] We can therefore compare cognitive maps in terms of the degree to which they are path-balanced.

Finally, we may be interested in two characteristics of cognitive maps which have nothing to do with the sign of the causal beliefs but are connected with the general pattern of linkages: the presence of causal cycles, and the density of the map. A *causal cycle* exists when it is possible to connect the endpoints of a causal path with a causal belief asserting that the terminal variable in the path affects the initial variable. Thus, the assertion that "A causes B, B causes C, and C causes A"

[7] Robert Jervis, "Consistency in Foreign Policy Views," in Richard L. Merritt, ed., *Communication in International Politics* (Urbana: University of Illinois Press 1972); Axelrod (fn. 4), "The Analysis of Cognitive Maps."

constitutes a causal cycle. It has been found in previous studies that cognitive maps coded from documents or transcripts rarely contain causal cycles; maps coded from certain types of questionnaires are more likely to contain them.[8] This property is interesting because it reflects a possible simplifying bias of normal verbal discourse.

The *density* of a cognitive map is simply a measure of its degree of interconnection. It is computed by dividing the number of causal assertions by the maximum possible number of causal assertions; that is,

$$\text{density} = \frac{n}{m(m-1)} \quad \begin{array}{l}\text{where } n = \text{the number of beliefs} \\ \text{and } \quad m = \text{the number of variables.}\end{array}$$

I will supplement the density measure with information about the relative frequency of conceptual variables per word of each document for each of the individuals. This measure will be called *variable frequency*.

In brief, it will be possible to compare cognitive maps in terms of the following characteristics: (1) the frequency of utility, goal, policy, and peripheral variables; (2) the degree of path-balance; (3) the degree to which policy choices are consistent with the maps; (4) the frequency of cycles; and (5) the density and variable frequency of the maps.

D. WHY LATIN AMERICAN ELITES?

There are a number of reasons for being interested in the causal assertions of Latin American foreign policy elites: (1) most obviously, because they are a subset of the universe of foreign policy elites and have not previously been studied in this way before (although in *Journeys Toward Progress*, Albert Hirschman clearly was concerned with accurately describing the causal beliefs of Latin American policy makers);[9] (2) because there are reasons to believe that the policies of developing nations are more affected by the cognitions of their elites and less by the constraints of large-scale bureaucracies and mass political pressures than the elites in developed nations;[10] and (3) because now that the developing nations have more bargaining power in international politics—thanks to OPEC and UNCTAD—the way in which their elites conceptualize their situations should be of increased interest to students of international politics in both the developed and the developing nations.[11]

[8] See the introductory chapter by Robert Axelrod in Axelrod (fn. 4).
[9] Hirschman (fn. 1), esp. chap. 4.
[10] See fn. 1.
[11] Since the actions of OPEC in 1973, several books have appeared which underline this theme. See, for example, *The Americas in a Changing World* (New York: Quad-

The three particular individuals were selected because of the importance of the the countries they represent—Brazil and Venezuela—and because they provide an opportunity to compare the cognitive maps of persons of varying degrees of political responsibility. I have chosen a chief executive, a finance minister, and a defense minister, on the assumption that the chief executive will have broader political responsibility than the other two. Also, the three individuals represent different points on the rather broad spectrum of opinion among Latin American elites concerning economic ties to the United States and other developed nations.

II

A. THE COGNITIVE MAP OF CARLOS ANDRÉS PÉREZ

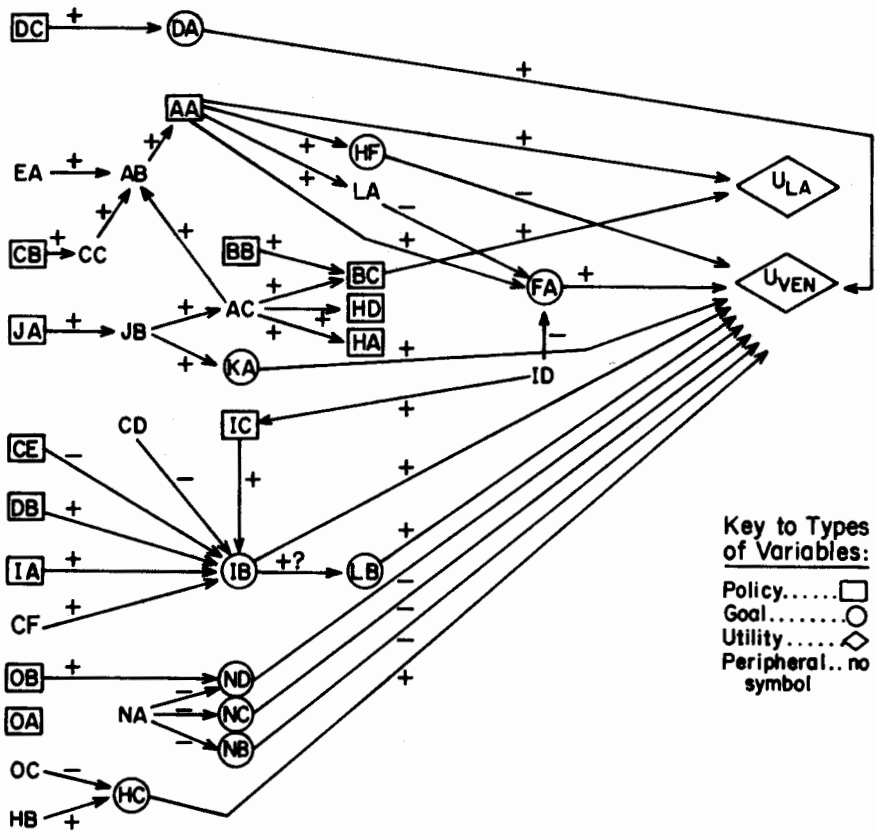
On August 29, 1975, President Pérez signed the Bill Reserving to the State the Industry and Commerce of Hydrocarbons. This legislation authorized the nationalization of fourteen foreign subsidiaries in the Venezuelan petroleum industry. The actual takeover occurred on January 1, 1976, and despite severe misgivings of the nationalized firms about the fairness of the terms of compensation, the nationalization occurred in a smooth and orderly manner. On the occasion of signing the bill, President Pérez made a speech, quoting from a number of earlier speeches, justifying the decisions connected with the nationalization.[12] In my opinion, and in the opinion of a number of Venezuelans I interviewed, the speech reveals many of his central causal beliefs.

I coded 43 distinct conceptual variables in the speech, the length of which is approximately 3000 words. The list of variables is given in Table 1; the cognitive map of causal beliefs linking those variables is shown in Figure 1. One can observe immediately from the cognitive map that there are several peripheral variables that affect policy variables; e.g., ID affects IC. There are some unbalanced paths. There are no causal cycles. There are also relatively few peripheral variables compared to the number of policy and goal variables, because the paths connecting the many policy variables to utility variables are, on the average, quite short.

Notable among the peripheral variables that affect policy variables are AB (national consensus) and ID (dependence on foreign technology). President Pérez asserted that national consensus affected the de-

rangle Books 1975); Luigi Einaudi, ed., *Beyond Cuba* (New York: Crane Russak 1974); and Ronald Hellman and H. J. Rosenbaum, eds., *Latin America: The Search for a New International Role* (New York: Halsted Press 1975).

[12] *Towards a Great Venezuela* . . . (fn. 6).



Variables with no causal linkages: GA, LC, DD, CA, FB and OA. I am counting AA and BC as policy variables because they have no direct effect on U_{VEN}, despite their direct effect on U_{LA}.

FIGURE 1. COGNITIVE MAP OF CARLOS ANDRÉS PÉREZ

cision to nationalize the oil industry, and that dependence on foreign technology affected the decision to seek the cooperation of foreign technicians. Both of these effects contribute to the lack of path-balance in the map. While national consensus (AB) positively affects national sovereignty (FA) according to Pérez, by influencing the decision to nationalize the oil industry (AA), it increases Venezuela's dependence on petroleum (LA), and hence lowers national sovereignty. Similarly, dependence on foreign technology (ID) indirectly increases the efficiency of the management of the nationalized oil industry (IB), while it directly decreases national sovereignty.

The variables with the highest number of beliefs originating from (or terminating at) them are AB, FA, and IB—national consensus, national sovereignty, and efficient management of the nationalized industry. Judging from their frequency of appearance, these variables also seem to be the most important ones in the speech. CF (joint effort of all Venezuelans) was also linked to IB (efficiency of the nationalized industry) in at least three different places.

President Pérez did not assert that there was a causal relationship between efficient management of the nationalized industry (IB) and establishment of a sound economic base by means of Venezuela's own national resources (LB) (which I take to mean the ability to convert oil wealth into self-sustained economic growth). Instead, he suggested that it is the duty of Venezuelans to turn a potential linkage into an actual one. "If we are not capable of establishing a sound economic base by means of our own natural resources, we will have betrayed the profound sense of this historic act."[13]

TABLE 1

LIST OF CONCEPTUAL VARIABLES IN THE COGNITIVE MAP OF CARLOS ANDRÉS PÉREZ

AA	nationalization (signing of "Bill Reserving to the State the Industry and Commerce of Hydrocarbons")
AB	national consensus
AC	nationalism; nationalistic consciousness
BB	recovery of the management of prices of oil (December 1970)
BC	opportunity of Venezuela to offer Latin America cooperation in the common struggle for independent development; cooperation of Venezuela with brother-nations of Latin America; Latin American integration
CA	dogmatism (shouting; demagoguery; disorder; haste)
CB	appointment of a broad presidential committee to study alternatives before submitting the plan for nationalization to Congress

[13] *Ibid.*, 23.

CC mustering the participation of the entire community
CD operation of the oil industry in areas that were never before managed by Venezuelans
CE management of the oil industry by the state (clumsy; inefficient; "lacking in adequate public spirit")
CF joint effort of all Venezuelans
DA identification and feeling of solidarity
DB seeking the advice of OPEC and European and Latin American nations that have nationalized their oil industries
DC consultation and seeking of consensus
DD nationalization of iron mines (January 1, 1975)
EA debates within legislative chambers
FA national sovereignty ("attainment of the Great Venezuela that will make us the true masters of our destiny"); "independence, national will, and the affirmation of our creative ability"; "economic liberation"
FB strategic interests of any continental or extracontinental powers
GA use of oil as instrument of subordination or dependency; as means of aggression or international disturbance
HA setting the example of international solidarity
HB possession of petroleum by OPEC nations
HC ability to bring the industrial nations to a dialogue and to a realization of the need for a new economic order
HD unity of Venezuela with the Third World
HF serious dangers faced as a result of the decisions taken
IA entrance of Venezuelan youth into fields of science and technology, enthusiastically and in great numbers
IB efficient and stable management of the nationalized industry
IC eliciting of cooperation of foreign technicians
ID dependence on foreign technology
JA promulgation of the law of culture
JB cultural development
KA democratic humanism
LA dependence on oil industry
LB establishment of a sound economic base by means of our own national resources
LC establishment of the *Petroleos de Venezuela* holding company not subject to the contingencies of political life
NA development of masses of workers who are conscious of their rights
NB appropriation of the national product by a few
NC wasting of the national product by the State
ND enjoyment by some workers of privileges over others
OA change of employers under nationalization law
OB turning over of the company houses in which they are living to some of the oil workers
OC crisis of misunderstanding being undergone by the industrial countries
U_{VEN} utility of Venezuela
U_{LA} utility of Latin America and "all countries that have been the victims of the economic totalitarianism of the big industrial nations"

There seems to be an implicit equation of the interests of Venezuela with those of all other nations in Latin America and in the Third World. Although Pérez qualified this equation slightly by mentioning the "current favorable historical circumstances" which made it possible,[14] the emphasis on solidarity and harmony of interests in the speech is quite striking.

B. THE COGNITIVE MAP OF ROBERTO DE OLIVEIRA CAMPOS

In 1963, Roberto Campos participated in the Conference on Inflation and Economic Growth in Rio de Janeiro. As a Brazilian economist, he was asked to speak on the subject of investment policy; he decided to focus on the relationship between inflation and foreign investment.[15] His response is of interest as a source for his cognitive map prior to assuming the post of Minister of Finance for Brazil from 1964 to 1967. It may be possible to explain his subsequent official policy decisions using the estimated map. In later stages of this research, I will compare this map with one coded from an article and a book written after his term of office.[16]

It is possible that the difference in the audience of Pérez and Campos may be responsible for the difference in their cognitive maps, since Pérez was addressing the Venezuelan people and Campos was addressing an international group of economists. Nevertheless, in looking at other works of Campos and at his official policies, it appears that he was indeed most interested in inflation and foreign investment and much less interested in the things that concerned Pérez—for instance, national sovereignty, national and international solidarity, and appropriation of the national product by a small proportion of the population. Indeed, he and his colleagues were later to argue that an increase in the concentration of wealth was a prerequisite of development.[17] Undoubtedly Campos shared with Pérez the goal of encouraging economic growth, yet the breadth of Pérez's concerns certainly exceeded that of Campos, while the sophistication of Campos's map clearly exceeded that of Pérez's.

[14] *Ibid.*, 10.

[15] Campos, in "Panel: Investment Policy," in Werner Baer and Isaac Kerstenetzky, eds., *Inflation and Growth in Latin America* (New Haven: Yale University Press 1964).

[16] Campos, *Reflections on Latin American Development* (Austin: University of Texas Press 1976); Campos, "A Retrospect over Brazilian Development Plans," in Howard S. Ellis, ed., *The Economy of Brazil* (Berkeley: University of California Press 1969).

[17] See Bruce Handler, "Flying High in Rio," *New York Times Magazine*, June 8, 1975, pp. 16-17, 87-94; Mario Henrique Simonsen and Roberto de Oliveira Campos, *A nova economia brasileira* (Rio de Janeiro: Livraria Jose Olympio 1974).

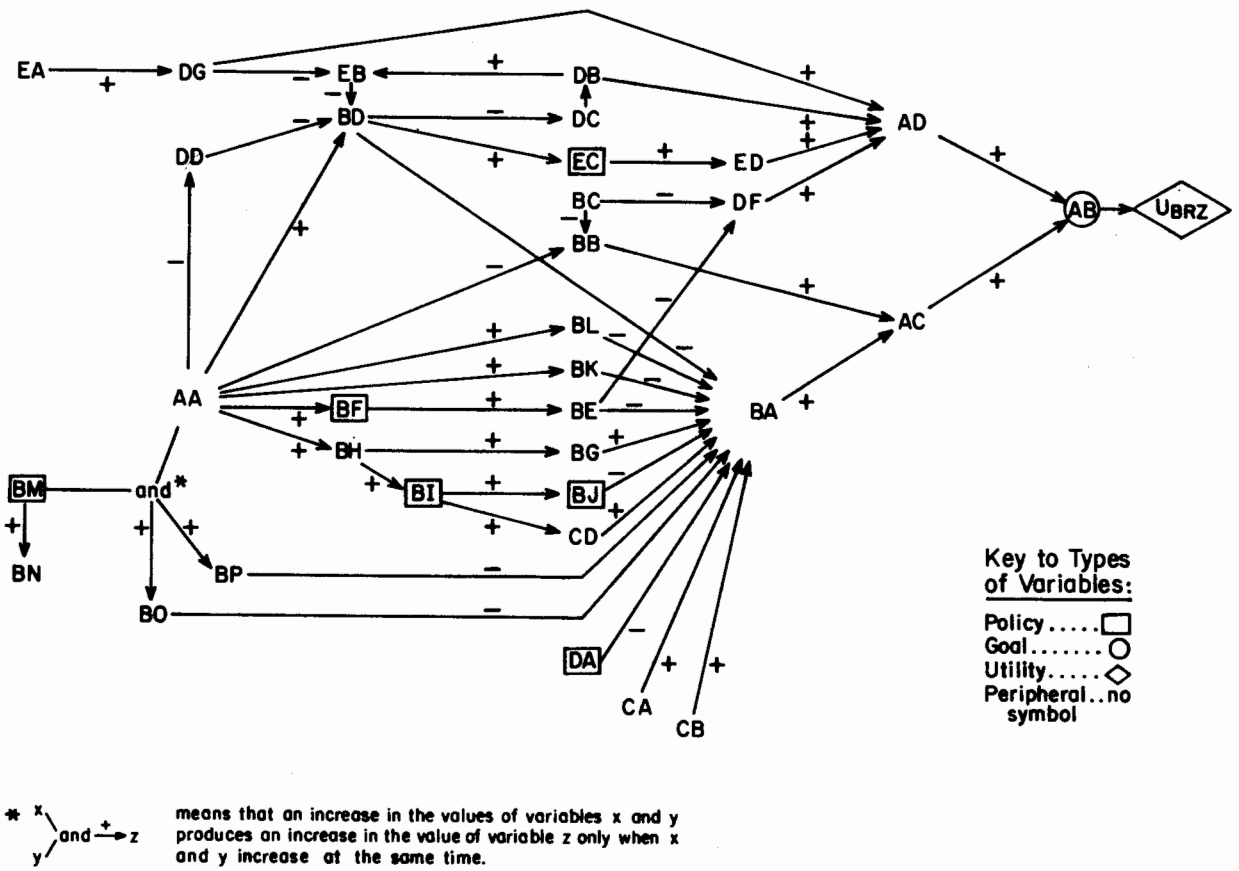


FIGURE 2. COGNITIVE MAP OF ROBERTO DE OLIVEIRA CAMPOS

Table 2 lists the conceptual variables, and Figure 2 shows the causal beliefs in Campos's cognitive map. There are 34 distinct conceptual

TABLE 2

LIST OF CONCEPTUAL VARIABLES IN THE COGNITIVE MAP OF ROBERTO DE OLIVEIRA CAMPOS

AA	inflation
AB	foreign investment (ability to capture foreign resources to supplement domestic development or stabilization efforts)
AC	foreign private investment
AD	mobilization of loans, both public and private
BA	foreign direct investment (private)
BB	foreign portfolio investment (private)
BC	debt default in bond markets
BD	balance-of-payments difficulties
BE	exchange risks
BF	periodic exchange-rate devaluations
BG	windfall profits to foreign investors
BH	exchange overvaluation
BI	exchange controls
BJ	restrictions on profit remittances
BK	uncertainty (particularly in the case of slowly maturing investment with a long gestation period)
BL	expectations of balance-of-payments difficulties
BM	freezing of "critical" prices
BN	rigidity in certain sectors
BO	internal profitability of price-inflexible sectors
BP	transferability of profits (internationally in price-inflexible sectors)
CA	size of the expanding market
CB	optimistic price expectations
CD	protection of home markets
DA	special legislation on profit remittances which established quantitative limits for yearly remittances and excluded reinvested profits from the capital basis for computation of future remittances
DB	availability of public loans from international agencies and national governments
DC	ability to pay back loans in the future
DD	export performance
DE	private loans
DF	united loan financing (private)
DG	availability of suppliers' credit (private)
EA	export promotion in creditor nation
EB	favorableness of financial terms of loans
EC	formation of commercial arrears
ED	involuntary financing of debt by foreign governments
U_{BRZ}	utility of Brazil

variables coded from a text of approximately 2000 words. In comparison with President Pérez's map, Campos's map has more peripheral variables, fewer policy variables, and more parallel paths between the two main variables—inflation and foreign investment. As in Pérez's map, not all the parallel paths have the same sign, and some peripheral variables directly affect policy variables. Unlike Pérez, Campos has a cycle of causation in his map, connecting favorability of financial terms of loans (EB) to balance-of-payments difficulties (BD), to ability to pay back loans (DC), to availability of public loans (DB), and back to favorability of terms. In the text, Campos commented that "we have here some sort of vicious circle."[18]

C. THE COGNITIVE MAP OF GENERAL AURELIO DE LYRA TAVARES

General Tavares was a member of the upper circle of the military elite that took power in Brazil in 1964. He was the Minister of War under President Costa e Silva and was one of the three officers who formed a provisional government after Costa e Silva suffered a major stroke.[19] The document used here for estimating his cognitive map is an excerpt from General Tavares's book, *O Exercito Brasileiro visto pelo seu Ministro.*[20] The excerpt was selected and translated into English by Paul Sigmund with the obvious intent of doing justice to General Tavares's ideas without translating the entire book. The original was meant for a general Brazilian audience, and thus may be compared to President Pérez's speech.

The cognitive map is shown in Figure 3, and the list of conceptual variables is given in Table 3. There are 37 distinct conceptual variables in the text of approximately 1500 words. Tavares's map is more like Pérez's than Campos's in that it has more goal variables, more policy variables, fewer peripheral variables, and therefore shorter paths from policy variables to utility than Campos's map. Nevertheless, Tavares's map has fewer policy variables than Pérez's; many of its goal variables are concerned with the utility of the Brazilian army rather than of the nation as a whole.

Tavares, unlike Pérez, showed no concern for the utility of other Latin American nations. In Tavares's map there are no causal cycles and there is only one pair of unbalanced, parallel paths, i.e., the paths

[18] Campos (fn. 15), 461.

[19] Anyda Marchant, "The Political and Legal Framework of Brazilian Life," in John Saunders, ed., *Modern Brazil* (Gainesville: University of Florida Press 1971), 115.

[20] Aurelio de Lyra Tavares, "The Brazilian Army and Politics," in Paul Sigmund, ed. and transl., *Models of Change in Latin America* (New York: Praeger 1970). Tavares's book was originally published in Recife in 1968.

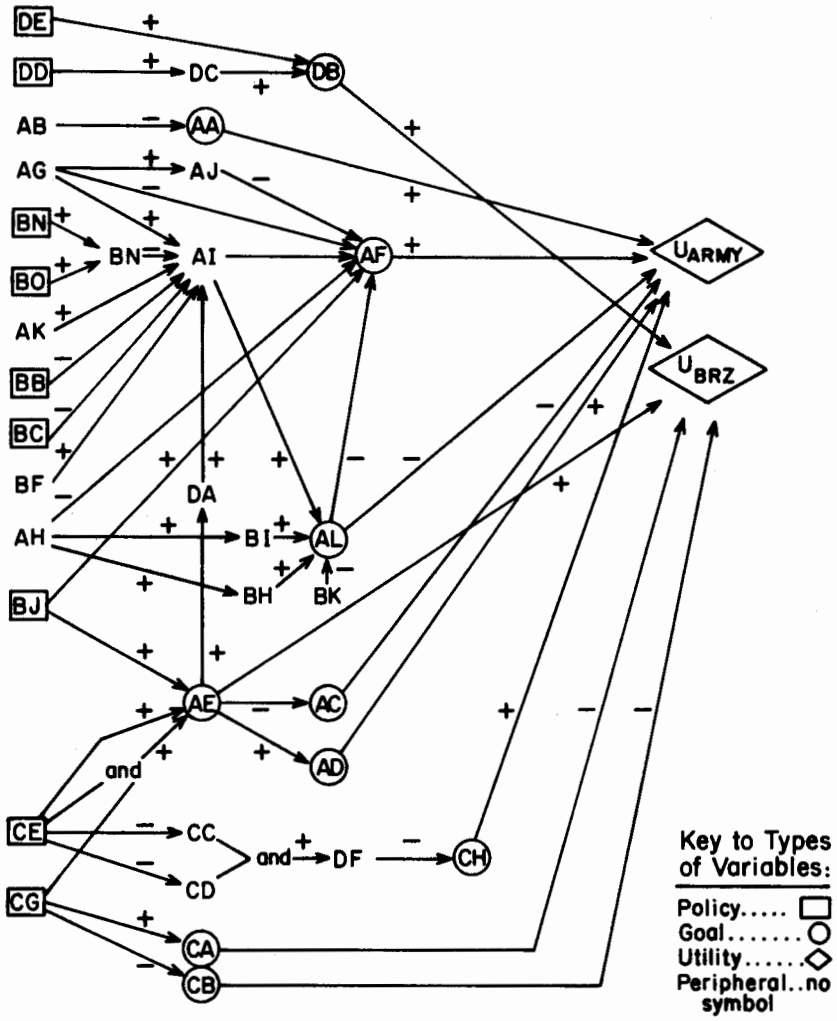


FIGURE 3. COGNITIVE MAP OF GENERAL AURELIO DE LYRA TAVARES

connecting intervention by the army in Brazilian politics (CG) and the utility of Brazil. On the one hand, Tavares admitted that intervention constitutes a violation of the legal structure of the country (CA); on the other hand, he argued that failure to intervene would have constituted betrayal of the nation's trust (CB).

Like Pérez's, and unlike Campos's, Tavares's map includes a variable reflecting the distribution of wealth. He asserted that the contrast between the wealth of a small minority and the poverty of the general population (BF) had resulted in an increase of the "subversiveness" of the population (AI), especially in Brazil's Northeast. Unlike Pérez, Tavares treated this concept as a peripheral variable rather than as a goal variable, or at least he made no assertion about the feasibility or desirability of reducing the concentration of wealth.

The sincerity of Tavares's map is put into question by the great pains that the General took to show that, despite the seizure of power by the military, it has maintained a civilian orientation and a commitment to democracy. There are fairly convincing reasons to believe him on this matter, such as his argument that the commitment to democracy (BJ) has helped to maintain the cohesion and discipline of the army (AF) while at the same time strengthening the democratic structure of the state (AE). But the linking of democratic structure (AE) to the use of civil liberties by certain groups that criticize the military government (DA), and thence to the subversiveness of the population (AI), casts some doubt on the nature of the military's commitment to democracy. At least, it appears that Tavares had misgivings about the civil libertarian aspects of democracy.

Judging from the number of assertions originating from, or terminating at, the different variables, it seems that General Tavares was most concerned about cohesion and discipline of the army (AF), recruitment of subversive elements (AL), and subversiveness of the population (AI). These concerns, and the clear division between (but implicit equation of) national and strictly military goal variables, suggest that the General's military role had a very strong influence on his concerns and beliefs. The heavy stress on subversion smacks of the ideological indoctrination that was commonly seen in the inter-American military training centers of the 1960's. If these beliefs were sincere—and I think they were—it would be interesting to trace their origins more precisely.[21]

[21] See Alfred Stepan, ed., *Authoritarian Brazil: Origin, Politics, and Future* (New Haven: Yale University Press 1973); Stepan, *The Military in Politics* (Princeton: Princeton University Press 1971).

TABLE 3

LIST OF CONCEPTUAL VARIABLES IN THE COGNITIVE MAP OF GENERAL AURELIO DE LYRA TAVARES

AA	independence of the army from change in the government
AB	power of the government to select, promote, and assign military leaders
AC	politicization of the army
AD	professionalization of the army
AE	stability and development of the democratic structure of the state
AF	cohesion and discipline of the army
AG	international Communism (external force)
AH	distortions and fluctuations in the policy of the government
AI	negative attitude of the worker in the city and the countryside toward the army; subversiveness of the populace
AJ	pacifism in the working class
AK	lack of education of the populace
AL	recruitment of subversive elements
BB	explanation of the meaning of free government and the dignity it assures to the man of the less favored classes
BC	pointing to the participation of the army in constructive civic-action and -aid programs
BF	contrast between the wealth of a small minority and the poverty of the general population
BH	Communism in Brazil
BI	organization of the peasants
BJ	commitment of military officers to democracy
BK	hierarchical structure of the army
BM	support and confidence of the people of the Northeast
BN	influence of the army in civic education, aid, and training programs
BO	support that the Corps of Engineers enjoys in the interior of the Northeast because of the essential public works it undertakes for the improvement of the living conditions of the people
CA	violation of the legal structure of the country
CB	betrayal of the country of which they are supposed to be the ultimate guardian
CC	militarism
CD	dictatorship
CE	civilian orientation of the military in Brazil (respect for civil power)
CG	intervention of the army among the parties, to take power for the sole purpose of re-establishing the democratic order
CH	prestige of army
DA	use of civil liberties by opponents of the restoration of Brazilian democracy to present the revolution of March 31 as a movement by the armed forces to establish a military dictatorship

DB	development
DC	development of the interior
DD	building of highways and opening up of distant regions by construction battalions of army
DE	defense by the army of petroleum and other subsoil resources
DF	military dictatorship
U_{ARMY}	utility of the army
U_{BRZ}	utility of Brazil

III

A. COMPARISON OF THE THREE COGNITIVE MAPS

In comparing the three maps in a more precise and comprehensive manner, I will confine myself to comparisons that may help to generate hypotheses for further examination and testing.

(H1) *The broader the political responsibility of the individual, the greater the number of goal variables.*

For the purposes of this section I will assume that one can rank the three individuals according to the breadth of their political responsibility, from broadest to narrowest, in the following manner: Pérez, Tavares, Campos. In terms of distance on a metric scale, I would place Tavares closer to Pérez than to Campos because of the great power of the military in post-1964 Brazilian governments. In column 1 of Table 4, it can be seen that individuals with greater responsibility did indeed have more goal variables.[22]

(H2) *Individuals with broader political responsibility will have fewer peripheral variables relative to policy variables.*

The evidence in favor of this hypothesis may be seen in column 4 of Table 4.

(H3) *Individuals with broader political responsibility will be more likely to believe that peripheral variables affect policy variables.*

In each map, I counted the number of policy variables that were directly affected by peripheral variables. The results are given in col-

[22] One might want to control for the size of the map by controlling for the number of conceptual variables. Since the maps have roughly the same number of variables (see Table 6), controlling for the number of variables does not radically change the results. One might question the decision to count those goal variables that affect U_{BRZ} together with those that affect U_{ARMY} for General Tavares while not counting variables that affect U_{LA} for President Pérez. It seemed to be appropriate because I was surer of Tavares's equation of the interests of the Brazilian Army with those of Brazil than I was of Pérez's equation of the interests of Venezuela with those of the rest of Latin America.

umn 1 of Table 5. This hypothesis cannot account for the case of General Tavares: one would expect him to perceive effects of peripheral variables on his policy variables, but he does not. If one uses other measures of the extent to which peripheral variables are seen to affect policy variables, the results remain the same. Thus, hypothesis 3 does not appear to be as promising as the first two hypotheses.

TABLE 4

RELATIONSHIP BETWEEN THE DEGREE OF POLITICAL RESPONSIBILITY AND THE FREQUENCY OF CONCEPTUAL VARIABLES

Individual	*(1)* *No. of Goal Variables*	*(2)* *No. of Policy Variables*	*(3)* *No. of Peripheral Variables*	*(4)* *Ratio of Peripheral to Policy Variables*
Pérez	10	17	14	.82
Tavares	10	9	16	1.77
Campos	1	6	26	4.33

Source: Figures 1-3.

(H4) *Cognitive maps will tend to be path-balanced.*

Despite the fact that none of the cognitive maps estimated here were path-balanced, the fact that only one policy variable was connected with utility by unbalanced paths in two of the three maps, and only two policy variables were connected with utility by unbalanced paths in

TABLE 5

RELATIONSHIP BETWEEN THE DEGREE OF POLITICAL RESPONSIBILITY AND THE PERCEPTION OF EFFECTS OF PERIPHERAL VARIABLES ON POLICY VARIABLES, PATH-BALANCE, AND THE PRESENCE OF CYCLES

Individual	*(1)* *No. of Policy Variables Directly Affected by Peripheral Variables*	*(2)* *No. of Policy Variables Connected to Utility by Unbalanced Paths*	*(3)* *No. of Causal Cycles in the Cognitive Maps*
Pérez	5	2	0
Tavares	0	1	0
Campos	3	1	1

Source: Figures 1-3.

the third map, seems to confirm, rather than to disconfirm, the hypothesis (see column 2 of Table 5). It will therefore be possible to use the cognitive maps of the three individuals to explain or predict their actual policies, using the criterion of consistency.

(H5) *Individuals with greater political responsibility will be more likely to assert beliefs which result in maps that are not path-balanced.*

This hypothesis clearly lacks promise, since all three individuals were about equally unlikely to have unbalanced paths in their maps.

(H6) *Cognitive maps coded from documents will tend to lack cycles.*

According to column 3 of Table 5, we can see that only Roberto Campos had a causal cycle in his cognitive map; in fact, he self-consciously asserted that such a cycle existed. Since this was the only cycle in the three maps, this hypothesis is supported by the data.

(H7) *Maps of individuals with broader political responsibility will have lower variable frequency and density than maps of individuals with narrower political responsibility.*

According to the figures in Table 6, the hypothesis appears to be reasonable, except that Tavares's map has higher variable frequency

TABLE 6

THE VARIABLE FREQUENCY AND DENSITY OF THE THREE COGNITIVE MAPS AND THEIR RELATIONSHIP TO THE BREADTH OF POLITICAL RESPONSIBILITY

Individual	*(1)* *No. of Variables* m	*(2)* *Approx. No. of Words in Text* x	*(3)* *Variable Frequency* m/x	*(4)* *No. of Causal Beliefs* n	*Density* $\frac{n}{m(m-1)}$
Pérez	43	3000	.014	43	.024
Tavares	37	1500	.025	47	.035
Campos	34	2000	.017	47	.042

than Campos's (according to the hypothesis, the reverse should be true). One might account for this finding by the fact that the document from which Tavares's map was coded was edited by the translator. According to the translator, with whom I discussed this problem, it is quite likely that variable frequency was increased by the editing. In any case, the seventh hypothesis is supported by the data.

B. CONSISTENCY IN POLICY CHOICES

Since the estimated maps of Pérez, Tavares, and Campos are almost path-balanced, it is possible to ask whether their actual policy choices were consistent with their maps. That is, did their policies set policy variables to values that produce an increase in utility, regardless of the number of paths that connect the policy variable to utility? In trying to answer this question I made a list of each individual's policy variables, specified the value that the variable would have to have in order to produce an increase in utility, and compared that value with the actual policies of the individual up to the time that the document was produced or shortly thereafter. For example, according to his map, Roberto Campos should have been opposed to periodic exchange-rate devaluations, exchange controls, and restrictions on profit remittances. This is in accord with his actual policies. Similarly, according to President Pérez's cognitive map, he should have been opposed to state management of the oil industry. In this case the policy is not consistent with the map, since Pérez established a state agency, called PETROVEN, to supervise the nationalized subsidiaries of foreign oil firms.[23] This was the *only* case of inconsistency for all three individuals, however.

One would naturally expect policy elites to demonstrate a high level of consistency in the short run between their policies and their assertions. A more interesting and important question is how they maintain or modify their assertions and beliefs in response to challenges from competing elites or the consequences of their own policy choices over time. In this regard, it may be interesting to note that Roberto Campos opposed the relaxation of anti-inflationary policies when this measure was proposed by President Costa e Silva shortly after he succeeded President Castello Branco in 1967. Costa e Silva, like Tavares, believed that the inequalities between rich and poor in Brazil were producing opportunities for political dissidents, and saw no contradiction between increased growth and a small amount of inflation.[24] Campos, on the other hand, may have perceived inflation to be incompatible with growth because of its negative effect on foreign investment. At least, that is what his unmodified cognitive map would tell us to expect from

[23] This should be seen in the light of the "depoliticization" of PETROVEN being attempted by Pérez. Pérez appointed General Alfonso Ravard, former head of the Corporación Venezolana de Guayana (and a man known for his integrity), to be the head of PETROVEN. See "Oil, Democracy and Development," *The Economist*, December 27, 1975, p. 12 of "Survey on Venezuela."

[24] "Artur da Costa e Silva," *Current Biography Yearbook 1967* (New York: H. W. Wilson 1967), 87.

his actual behavior. Thus, cognitive maps have a predictive, as well as explanatory, capability which remains to be tested in future research.[25]

C. SUMMARY OF RESULTS

The cognitive maps estimated here exhibit a number of interesting regularities that have been found in other studies, as well as some new properties that have not previously been investigated. As in earlier studies, the maps tend to be path-balanced and acyclic, making it possible to examine the consistency of the policy choices of the three individuals. With only one exception, all the policy choices of the three individuals were consistent with their cognitive maps.

A totally new set of findings is derived by examining the effects of variance in the breadth of political responsibility on the cognitive maps of different individuals. In general, we can say that breadth of political responsibility is positively related to the frequency of goal variables, negatively related to the ratio of peripheral to policy variables, and negatively related to the density and variable frequency of the map. The breadth of political responsibility appears to be unrelated to the tendency to assert unbalanced causal paths or to assert effects of peripheral variables on policy variables. Finally, the policies of the three individuals were, on the whole, consistent with their cognitive maps, suggesting that the maps may have some explanatory (and perhaps even predictive) capability. Clearly, I do not want to make any claims for the universality of these findings based on a decidedly non-random sample of three documents of three individuals. Yet the results are encouraging enough to continue these investigations using a broader and more representative sample.

IV

Having summarized the empirical findings in section III, I will focus in this concluding section on the relative advantages and disadvantages of cognitive mapping. The following are general criteria for theoretical approaches in social scientific inquiry: (1) parsimony, (2) generality, (3) descriptive power, (4) explanatory power, and (5) richness of normative implications.

Parsimony is the ability of a theoretical approach to generate a large number and variety of significant propositions from a relatively small

[25] For an example of the predictive power of cognitive maps, see Matthew Bonham and Michael Shapiro, "Explanation of the Unexpected: The Syrian Intervention in Jordan in 1970," in Axelrod (fn. 4).

number of assumptions. Cognitive mapping clearly scores high in this regard.

Generality is the ease with which a theoretical approach may be applied to different subject matters. Since cognitive maps have been used to study such disparate phenomena as the American constitutional convention, British imperialism in Persia, the Third U.N. Conference on the Law of the Sea, the crisis in the Middle East,[26] and now the policies of Latin American elites, it is safe to score the approach highly on this dimension.

Descriptive power is the ability of a theoretical approach to suggest strategies for observation which result in reliable and valid measurements of real-world phenomena. An independent test of the reliability or validity of measurements was not made in this paper, but in earlier studies a high level of intercoder reliability and face validity was obtained. Thus, the approach usually scores high on this dimension.

The *explanatory power* of a theoretical approach is a function of the plausibility of its assumptions and of the accuracy of its predictions (including the idea of "postdiction," or predicting relationships among variables which may have held in the past). It is here that certain important questions arise concerning cognitive mapping. How plausible is the assumption of sincerity? Does the notion of "policy consistency" really *explain* the policy choices of elites, or does it merely *reflect* the attempts of elites to justify their policy choices after they have been made? The case in favor of the explanatory power of cognitive maps is strengthened by any evidence of truly predictive capabilities. That is, when one can use a cognitive map estimated at time T_1 in the past to predict an individual's policy choices at time T_2 in the future, assuming that the map at time T_2 contains (or at least strongly resembles) the map at time T_1, then the score for explanatory power rises. Since it was not possible to make such a prediction based on the material in this paper, the assessment of explanatory power must rest on the few studies in which such predictions were made and tested. So far, the record has been good.

All social scientific approaches have *normative implications*. That is, they all carry with them some prescriptive propositions that either justify or arise out of the inquiry itself. For example, I have justified the study of Latin American foreign policies by citing the increased bargaining power of the developing countries and the effects of this increased power on the interests of all nations. While it is the aim of

[26] See *ibid.*, throughout.

this research to increase our understanding of Latin American foreign policies, the question of how this understanding is to be translated into action is another matter.

Cognitive maps have the advantage and the disadvantage of taking the causal assertions of political elites as they are, not as they should be. The approach requires a temporary suspension of criticism so that the beliefs of the observer do not contaminate the beliefs of the observed. If this temporary suspension turns into a permanent one, the normative power of the approach is greatly diminished. But the criticism of another person's beliefs must be based on standards that go beyond the personal beliefs and experiences of the critic.

Several such standards are suggested in this paper: (1) the degree to which the individual fails to make distinctions that are commonly made by others (which I will call the *conflation of concepts*); (2) the degree to which the individual's assertions agree with those made by persons of similar levels of expertise and experience; (3) the degree to which the individual's assertions reflect a certain amount of consistency over time; and (4) the degree to which changes in assertions reflect an ability to learn. Since I have not examined changes over time in this paper, I will concentrate on the first two types of standards.

The conflation of concepts was particularly useful as a standard in criticizing the assertions of Carlos Andrés Pérez and Aurelio de Lyra Tavares. Pérez conflated the interests of Venezuela with those of all Latin American and many other Third-World nations. Tavares conflated the interests of the Brazilian army with those of the Brazilian nation.

In omitting any consideration of the distributional effects of his anti-inflationary and pro-foreign investment policies, Campos was guilty of violating the second standard. On the other hand, both Pérez and Tavares included a distributional variable in their maps, as have many policy makers and commentators on policy making in developing nations. The absence of that conceptual variable in Campos's map reflects a lack of sensitivity to that question.

Perhaps the most important application of cognitive mapping, therefore, would be to provide the user with a list of concepts which he himself distinguished but which others did not, and vice versa. Similarly, one could provide the user with a list of assertions made by others which do not agree with those that he himself would make. The purpose of such an application would be to prevent the sort of talking at cross-purposes that often takes place at political negotiating sessions in both domestic and international settings.

In summary, cognitive mapping scores high on all the criteria: parsimony, generality, descriptive power, explanatory power, and richness of normative implications. The approach certainly seems desirable as a supplement to the currently available alternatives to the explanation of foreign policies, including what has come to be called the study of "comparative foreign policy," theories of imperialism and dependency, and the various power-political approaches. This statement is based on the idea that individual belief systems are an important factor in determining policies. If alternative approaches do not allow for variance in individual belief systems,[27] they are likely to have much less explanatory power. Nevertheless, it is possible that belief systems of elites are closely related to "structural" characteristics of the nation-state (its power, its degree of dependency, the nature of its political institutions, and so forth), and that even better theories can be produced by a combination of cognitive psychological and "structural" approaches. It seems reasonable to require, however, that cognitive factors receive much greater attention now than they have received in the past.

[27] The comparative foreign policy approach allows for variance in perceptions at the national level in explaining the actions of the state. Yet it does so only in a grudging manner, so that perceptions remain secondary, and "structural" variables are primary. See the introductory chapter by the editor in James N. Rosenau, ed., *Comparing Foreign Policies* (Beverly Hills, Calif.: Sage 1974).