

CHAPTER EIGHT

Comparative Cognition: Politics of
International Control of the Oceans
—Jeffrey Hart

This empirical study begins to explore the relationships between the cognitive maps of different actors, in contrast to the previous studies, all of which analyzed one cognitive map at a time. The relevant political actors in this study are, moreover, highly complex groups of people, including nations, groups of nations, and the international oil industry. Comparative data on the perceived causal linkages of these actors is generated by using the questionnaire technique with a panel of experts who are familiar with a large body of source material on the relevant actors.

The particular problems that this study begins to answer are important for virtually all policy domains:

- (1) How does the objective situation of an actor affect its perception (or nonperception) of causal linkages in its policy environment?*
- (2) How does the internal complexity of an actor affect the consistency between its stated assertions and its policy positions?*
- (3) Do actors who agree on policy positions also tend to agree on the causal linkages supporting these positions?**

The subject of this chapter is international cooperation in the exploitation and conservation of ocean resources. In 1969, a United Nations resolution called for the establishment of an international regime to regulate and control the oceans. The objective of this chapter is to consider the feasibility of analyzing the cognitive maps of the principal actors involved in this issue and to obtain in this manner information about the probable outcome of the debate. The actors to be examined include individual nations, groups of nations with common views on the issue, and the world petroleum industry. In this trial study the derivation of

* For acknowledgements, see p. 217.

cognitive maps for a variety of actors is based on the conclusions of a panel of judges. These judges estimated the cognitive maps of the principal actors on the basis of a wide variety of documentary materials. Unlike Roberts' study in Chapter 7 of this book, in the present study the judges estimated others' beliefs, rather than simply their own.

Two types of propositions will be used to analyze the estimated cognitive maps: propositions about the nature of each actor's cognitive map taken as a single, and relatively coherent, entity; and propositions about the differences between pairs of cognitive maps. In addition, the chapter focuses on the subgraphs (called goal structures) of individual cognitive maps formed by the goal variables (variables whose values directly impinge upon the actor's utility). From this analysis, several educated guesses about the final outcome of the 1974-1975 Law of the Sea Conference will emerge.

HISTORY OF THE OCEAN REGIME PROPOSAL

A regime for the control of ocean space was first proposed by the Maltese ambassador to the United Nations, Arvid Pardo, in the General Assembly on August 18, 1967.¹ Pardo's visions of wealth from the oceans, along with his designs for using that wealth to finance a more effective international organization and to redistribute the world's wealth, took most of the members of the United Nations by surprise. The less developed nations were delighted with the idea of benefiting from the exploitation of ocean resources and supported the proposal strongly. The developed nations were not delighted. Vital interests such as military capabilities, energy supplies, and mineral resources were at stake. They wanted more time to think. Nevertheless, in December of 1969, a resolution was passed in the General Assembly reserving the seabed and its resources beyond the limit of national jurisdiction exclusively for peaceful purposes and in the interest of mankind.² In 1970, a resolution calling for a new conference on the law of the sea was passed.³ After several delays, the first session of this conference began in Caracas in June of 1974. Well over a

¹ United Nations, Document A/6840 Add. 2 and A/6695.

² This resolution, No. 2574 (XXIV), was passed by a vote of 62 in favor, 28 against, and 28 abstaining.

³ This was Resolution No. 2749 (XXV) of December 17, 1970.

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dozen different proposals were put forth and discussed. Although some progress was made in Caracas toward the narrowing of debate, no agreement was reached, and it is not likely that an agreement will emerge until the next session, scheduled to take place in March 1975, in Vienna. Since the estimation of cognitive maps used in this study was completed prior to the Caracas meeting, it will be possible to examine the results of the analysis in the light of that debate, while still allowing speculation about the final outcome.

GOAL STRUCTURES IN COGNITIVE MAPS

A cognitive map is an actor's belief about the causal relations between pairs of variables in his conceptual inventory. We assume that there are three types of concept variables: (1) policy variables, (2) goal variables, and (3) utility. Goal variables are variables that impinge directly and positively upon the actor's utility variable. We then define a *goal structure* of an actor as the subgraph of that actor's cognitive map which consists of all of his goals and the causal relationships between them. These definitions are illustrated in Figure 8-1. A hypothetical cognitive map is given in the first part of the figure, and the goal structure of this map is given in the second part.

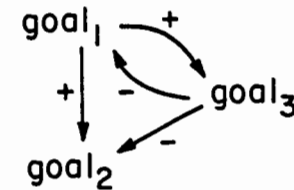
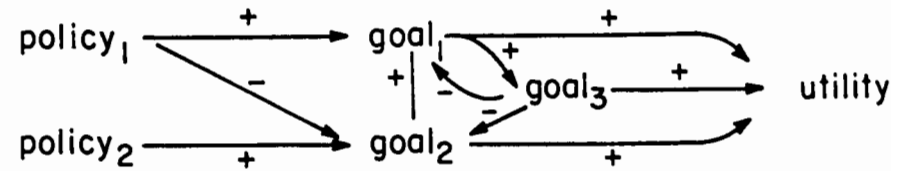
It will sometimes be convenient to represent cognitive maps and their derived goal structures in the form of adjacency matrices (see Bonham and Shapiro in Chapter 6). For illustrative purposes, this is done in the third part of Figure 8-1, where the adjacency matrix of the goal structure is indicated by dotted lines within the larger adjacency matrix of the hypothetical cognitive map.

The fact that different actors may have different cognitive maps with respect to the same set of variables suggests that differences in cognitive maps, and especially differences in goal structures, can be used to explain differences in positions taken on policy and goal variables. The basic idea is the notion of "distance" between the goal structures of two actors. Distance will be defined here in terms of an entry-by-entry comparison of the goal adjacency matrices of the two actors. For example, if two goal structures differ in only one entry in their adjacency matrices, their distance from each other is very small. Admittedly, the changing of a single causal link may have a very strong effect on the actor's position,

FIGURE 8-1.

Cognitive Maps and Goal Structures

A Hypothetical Cognitive Map
 The Goal Structure of the Hypothetical Cognitive Map
 Adjacency Matrix for the Cognitive Map with the Adjacency Matrix
 for the Goal Structure Shown in Dotted Lines



	p ₁	p ₂	g ₁	g ₂	g ₃	u
policy ₁	o	o	+	-	o	o
policy ₂	o	o	o	+	o	o
goal ₁	o	o	o	+	+	+
goal ₂	o	o	o	o	o	+
goal ₃	o	o	-	-	o	+
utility	o	o	o	o	o	o

and, thus, another way of explaining positions would be to investigate the consequences of slight differences in goal structures.

The point is that if actors take different positions on political issues because their cognitions are different, rather than because of some fundamental differences that are independent of cognitive factors, then it may be possible to get actors to agree on some mutually beneficial policy by altering their cognitions. This may be done in a variety of ways, which will be explored in the final section of this chapter. One could, for example, change an actor's cognitions by making him aware of the temptation to simplify causal beliefs. Thus, the analysis of cognitive maps is an abstract, but relatively simple, approach that can help us to understand how international actors come to take positions on international issues, such as the international ocean regime, while also suggesting novel ways of influencing this process.

HYPOTHESES

In order to help clarify the presentation of the data, it is helpful to present the three main hypotheses of this study. As we shall see, these three hypotheses are partly supported and partly refuted by the data. Fortunately, in situations such as these we are able to learn at least as much from our surprises as from our successes.

Hypothesis 1. The developed nations will have denser goal structures than the developing nations.

This is a hypothesis about how the nature of an actor affects its perception of the linkages. It is based on the expectation that the greater research capabilities and wider interests of the developed nations will lead them to perceive more causal linkages than the developing nations perceive with respect to the complex issues of an ocean regime. The formal measure of density of a goal structure is the proportion of all possible linkages that are actually perceived.⁴

Hypothesis 2. The positions taken by the actors will be consistent with their goal structures.

This hypothesis states that even complex actors, such as nations and the oil industry, are consistent, at least on a specialized policy domain such as ocean regime issues. The formal test is that inconsistency can be observed whenever an actor has

⁴ The formula for density is $m/n(n-1)$, where m is the number of arrows and n is the number of points in the graph.

a balanced goal structures but does not take positions in accordance with that structure.

Hypothesis 3. Actors with similar positions will have similar beliefs.

This hypothesis states that it is rare for two actors to support the same positions but have widely divergent images of the causal linkages that lead them to their positions. If true, it would mean that alignments of convenience (based on similarity of positions) would also tend to be alignments of perception (based on similarity of beliefs).

In order to test these hypotheses, a methodology was developed to generate data on the goal structures of the relevant actors. After explaining this methodology in the next section, the data will be presented and analyzed. Then implications will be drawn for the potential alignments of the actors and the future of an ocean regime.

METHODS

In order to show how one might gain knowledge about the way the cognitions of international actors affect their positions on political issues, a group of judges was used to estimate the cognitive maps of a small set of actors on a specific issue, the establishment of an international ocean regime. The group consisted of three individuals in the Technology and International Systems Project at the Institute of International Studies in Berkeley, California.⁵ All of these individuals are citizens of the United States. They are widely read on the subject of the international ocean regime and international politics in general. They had a self-consciously favorable view toward the regime and Pardo's plan.

The Actors

Two preliminary tasks were the selection of actors and the selection of goal variables. For the actors, there were two criteria. The first was that the actor must be essential to the success of an international ocean regime. The second was that the elements of compound actors share a large number of beliefs about the causal links between variables. Six actors were chosen for this

⁵ The individuals are Professor Ernst B. Haas, Peter Cowhey, and Janet Schmidt.

exercise: (1) the United States, (2) the Soviet Union, (3) the other developed nations (the OECD nations minus the United States),⁶ (4) the oil-exporting developing nations,⁷ (5) the non-oil-exporting developing nations (called the Other LDCs), and (6) the world oil industry.

The Goal Variables

Fourteen variables were chosen by the expert group to be the basis for comparing the cognitive maps of the six actors (see Table 8-1). These variables were selected on the basis that at least one of the actors considered the variable to be a goal.

TABLE 8-1
GOALS PERTAINING TO THE ESTABLISHMENT
OF AN OCEAN REGIME

- | | |
|----|---|
| 1 | Obtaining a high level of petroleum exploitation of the sea bed |
| 2 | Obtaining a high level of hard mineral (manganese nodule) exploitation of the sea bed |
| 3 | Obtaining the maximum sustainable yield from ocean fisheries |
| 4 | Conserving mineral resources (nodules) in the ocean |
| 5 | Scheduling the development of land and ocean reserves of petroleum to meet future demand |
| 6 | Conservation of ocean fisheries |
| 7 | Alleviation of world protein deficiencies |
| 8 | Reduction of the potential for conflict over matters pertaining to the ocean |
| 9 | Establishment of machinery for resolving conflicts pertaining to the ocean |
| 10 | Reduction of military use of the sea bed and deep ocean (emplacement of installations on the sea bed and/or free passage of submarines) |
| 11 | Preventing expansion of national jurisdiction into the sea |
| 12 | Maintaining the right of innocent passage through territorial waters |
| 13 | Preserving the nonliving environment of the ocean |
| 14 | Establishing an international regime for ocean space |

⁶ The states referred to as the OECD states are France, Britain, West Germany, Belgium, the Netherlands, Ireland, Denmark, Spain, Italy, Norway, Sweden, Greece, Portugal, Iceland, Japan, Canada, Australia, and New Zealand.

⁷ The major oil-exporting nations are Abu Dhabi, Algeria, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, and Venezuela. All are members of OPEC. Ecuador, Gabon, and Trinidad/Tobago are members of OPEC, or have applied for membership, but have not yet become major exporters.

A distinction was made between exploitation of petroleum (goal 1) and hard minerals (2) for a number of reasons: several actors make the distinction; the technology for the two types of exploitation will be very different; and petroleum exploitation is most likely to occur within the territorial waters of nations, while hard minerals are mainly to be found in the deep ocean. A maximum sustainable yield (abbreviated as MSY) for ocean fisheries (3) is obtained when fishing is limited to levels that can be supported by the fisheries without decreasing the stock or future catches. Exploitation of hard minerals, in the form of manganese nodules, can be accompanied by a management system that maintains the exploitation at levels that permit the natural replenishment of the resources. Thus, the conservation of mineral resources (4) was included as a goal variable.

Scheduling the development of land and ocean reserves of petroleum (5) means maintaining a balance between the exploitation of these two forms of petroleum deposits. The United States, for example, wants to develop offshore reserves as an alternative to imported oil, even though offshore oil is much more expensive than oil from land reserves. In addition, the United States maintains land reserves in case of war or emergency, since offshore reserves would be more vulnerable. The goal of conserving fisheries (6) is taken here to include management techniques such as stocking and mariculture, as well as the more limited techniques of setting quotas, issuing licences, and inspecting fishing grounds. A separate goal of preserving the nonliving environment (13) was included, since many of the actors do not consider fishery conservation to involve management of the nonliving environment. For example, a fishery management regime would be expected to react to an oil spill, but not to prevent it. Alleviating world protein deficiencies (7) is a straightforward goal that could be achieved through the use of fish meal for animal feed, through the direct consumption of fish, or possibly from the synthesis of protein from petrochemical by-products.

The goals concerning conflict or potential conflict are: reducing potential conflict over matters pertaining to the ocean (8), the establishment of machinery for resolving conflicts pertaining to the ocean (9), and the reduction of military uses of the ocean (10). It was assumed that conflict reduction could take place on an *ad hoc* basis without extensive machinery—that is, without

formal organizations designed to perform such conflict-resolving tasks as mediation, arbitration, inspection, or peace keeping.

There are two goals concerning national control over adjacent waters. Preventing expansion of national jurisdiction into the sea (11) does not have to affect navigation. It may be limited to jurisdiction over mineral or living resources. Another goal (12) is innocent passage, involving the rights of ocean vessels to pass through territorial waters of other nations without interference.

Finally, there is the variable of establishing an international regime for ocean space (14). It was assumed that this regime would have the following minimal properties: (1) the regime would include standing machinery, that is, a formal organization with a staff and a budget; (2) this organization would have jurisdiction over more than one of the general domains of mineral resources, living resources, conflict resolution, and control over national waters; and (3) some area of the ocean would be specified as *res communis*, to be explored, if at all, for the benefit of all mankind. Not all of the current proposals for an international regime meet these criteria, but the group of judges had the Pardo proposal uppermost in their minds.

Estimating the Goal Structures

After selecting the actors and the variables, the group of judges was asked to fill out a goal adjacency matrix, similar to the one in Figure 8-1, for each of the actors. Members of the group consulted an extensive set of fifty-one documentary sources (a list of which may be obtained from the author on request). These documents included position papers, transcripts of debates, and commentaries on the evolution of the law of the sea by legal scholars and social scientists. In an initial trial run, good inter-coder agreement was obtained.⁸ Because of limitations of time, expertise, and mental capacity, it was impossible for each member of the group to fill out a matrix for each actor. Therefore, the group subsequently arrived at a group consensus by discussion. This was very time-consuming, but the payoff in accuracy was judged to be more important than a more complete test of inter-coder reliability.

The end result of this process is displayed in Tables 8-2 through 8-9. The symbols +, -, a, and cd in Tables 8-3 through

⁸ In the initial run, goal structures for the two superpowers were estimated. Over 80 percent of the entries of the goal adjacency matrices were in agreement for each pair of coders. Most discrepancies were the result of a zero entry in one matrix and a non-zero entry in the other.

TABLE 8-2

POSITIONS TAKEN ON THE OCEAN GOALS AND THE RELATIVE SALIENCE OF GOALS FOR EACH ACTOR

Goals	U.S.		USSR		OECD		Oil exporters		Other LDCs		Oil industry	
	P ^a	S ^b	P	S	P	S	P	S	P	S	P	S
Oil exploitation	+	m	o	l	+	h	+	h	-	m	+	h
Nodule exploitation	+	m	+	m	+	m	o	l	+	m	o	l
MSY (sustainable yield)	-	m	+	h	+	m	o	l	+	h	o	l
Nodule conservation	-	l	-	l	-	l	o	l	+	m	-	m
Scheduled development	+	l	+	l	-	h	+	h	o	l	o	l
Fishery conservation	+	m	+	m	+	l	o	l	+	h	o	l
World protein	+	l	+	l	+	l	o	l	+	h	o	l
Conflict reduction	+	m	+	m	+	h	o	l	+	h	+	h
Conflict machinery	+	l	-	l	+	m	o	l	?	h	+	l
Reduction of military	-	h	-	h	+	m	+	h	+	m	o	l
Prevention of expansion	+	m	+	h	+	h	+	h	+	h	+	h
Innocent passage	+	h	+	h	+	h	+	h	-	h	+	h
Nonliving environment	+	h	o	l	+	m	-	l	+	h	+	l
International regime	+	m	-	l	a ^d	m	o	l	+	m	+	h

^a P stands for "position," and + = favor or support, - = oppose, o = no position or neutral, and a = ambiguous (some support and some oppose).

^b S stands for "salience," and l = low, m = medium, and h = high.

^c Britain and France are opposed to reduction of military use of the oceans, since they have substantial naval forces and some submarines. Australia and New Zealand would also oppose reduced military use, since they depend on American naval forces to deter Chinese or Russian aggression in that part of the world. The other OECD members generally favor demilitarization in world politics.

^d Some OECD nations, such as Canada, are in favor of limited international regimes, while others are opposed.

TABLE 8-3
GOAL ADJACENCY MATRIX FOR THE UNITED STATES

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Oil exploitation	0	+	-	-	cd	-	a	-	+	+	-	-	-	-
Nodule exploitation	+	0	0	-	0	0	0	-	+	a	-	-	-	-
MSY (sustainable yield)	0	0	0	+	0	-	+	-	+	0	-	+	0	0
Nodule conservation	-	0	0	0	a	0	0	-	+	0	-	+	+	+
Scheduled development	+	-	0	0	0	0	0	-	+	0	-	+	+	+
Fishery conservation	-	0	cd	0	0	0	+	cd	0	0	-	+	+	+
World protein	+	+	+	0	+	0	0	0	0	0	+	0	0	0
Conflict reduction	+	+	0	+	+	+	0	0	-	+	+	+	0	cd
Conflict machinery	+	+	0	+	0	0	0	0	0	+	+	+	0	0
Reduction of military use	0	0	-	0	0	0	0	+	0	-	0	0	0	0
Prevention of expansion	-	+	a	0	-	0	0	-	+	-	0	0	+	0
Innocent passage	+	-	-	0	+	+	+	-	+	-	+	0	-	+
Nonliving environment	-	-	0	+	-	+	0	-	+	+	0	-	0	+
International regime	+	+	+	+	+	+	+	+	+	-	-	+	+	0

TABLE 8-4
GOAL ADJACENCY MATRIX FOR THE SOVIET UNION

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Oil exploitation	0	+	-	-	cd	-	a	-	+	+	-	-	-	0
Nodule exploitation	+	0	0	+	0	0	0	-	+	a	-	-	-	-
MSY (sustainable yield)	0	0	0	0	0	-	+	-	+	0	-	+	0	cd
Nodule conservation	0	-	0	0	0	0	0	-	+	0	-	+	+	+
Scheduled development	0	0	0	0	0	0	0	-	+	0	-	+	+	+
Fishery conservation	0	0	cd	0	0	0	+	-	+	0	-	+	0	0
World protein	+	+	+	0	+	0	0	cd	0	0	+	0	0	cd
Conflict reduction	+	0	0	+	+	0	0	0	-	+	+	+	0	0
Conflict machinery	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Reduction of military use	0	-	0	0	0	0	0	-	0	0	0	0	0	0
Prevention of expansion	-	+	a	0	-	0	0	-	+	-	0	-	0	-
Innocent passage	+	-	+	0	+	0	+	0	+	-	+	0	-	+
Nonliving environment	-	-	0	+	-	+	0	-	+	+	0	-	0	+
International regime	+	+	+	+	+	+	+	+	0	-	-	+	+	0

TABLE 8-5
GOAL ADJACENCY MATRIX FOR THE OECD STATES
(MINUS THE U.S.)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Oil exploitation	0	+	-	-	-	-	cd	+	-	+	-	+	-	-
Nodule exploitation	+	0	-	-	-	-	0	+	-	+	-	+	-	-
MSY (sustainable yield)	+	-	0	+	0	+	0	0	+	+	0	0	0	0
Nodule conservation	0	-	0	0	0	0	0	0	+	+	0	+	0	+
Scheduled development	+	0	0	0	0	0	+	0	0	0	0	0	0	cd
Fishery conservation	+	0	+	0	0	0	0	0	+	+	+	+	0	+
World protein	+	0	+	0	0	0	0	0	0	0	+	+	0	cd
Conflict reduction	+	+	+	+	0	+	0	0	+	+	+	+	0	cd
Conflict machinery	+	+	+	+	0	+	0	+	0	+	+	+	0	cd
Reduction of military use	+	+	+	+	0	+	0	+	0	+	+	+	0	+
Prevention of expansion	-	+	+	+	0	0	0	+	0	0	0	+	-	+
Innocent passage	+	+	+	0	+	0	0	+	0	0	0	+	0	cd
Nonliving environment	-	-	+	+	+	0	0	+	-	+	+	0	-	+
International regime	0	-	+	+	0	+	+	+	+	0	-	+	0	0

TABLE 8-6
GOAL ADJACENCY MATRIX FOR THE OIL EXPORTERS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Oil exploitation	0	+	-	0	+	0	+	+	0	+	-	-	0	cd
Nodule exploitation	+	0	0	-	+	0	0	-	0	0	-	-	0	-
MSY (sustainable yield)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nodule conservation	0	0	0	0	0	0	0	+	+	+	+	+	+	cd
Scheduled development	+	0	0	0	0	0	+	+	0	+	-	0	0	0
Fishery conservation	0	0	0	0	0	0	0	0	0	0	0	0	0	0
World protein	+	0	0	0	0	0	0	0	0	0	0	0	0	0
Conflict reduction	+	+	+	+	+	0	0	0	0	0	0	0	0	0
Conflict machinery	+	+	+	+	+	0	0	0	0	0	0	0	0	0
Reduction of military use	+	+	0	0	+	0	0	0	0	0	+	+	0	+
Prevention of expansion	+	+	0	0	-	0	0	-	-	-	0	0	0	0
Innocent passage	+	0	0	0	-	0	0	-	-	-	0	0	0	0
Nonliving environment	-	0	0	0	-	0	0	-	0	+	0	-	0	+
International regime	0	-	0	0	0	0	0	+	+	+	0	0	+	0

TABLE 8-7
GOAL ADJACENCY MATRIX FOR THE OTHER LDCs

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Oil exploitation	0	+	-	-	-	-	0	-	-	-	-	-	-	-
Nodule exploitation	+	0	-	-	0	-	-	-	-	-	-	-	-	-
MSY (sustainable yield)	+	-	0	0	0	+	0	-	+	+	0	+	+	cd
Nodule conservation	0	-	0	0	+	0	0	+	0	0	+	0	0	cd
Scheduled development	+	0	0	0	0	0	+	0	+	0	0	0	+	+
Fishery conservation	0	-	0	+	0	0	0	-	0	0	0	0	0	+
World protein	0	-	+	0	0	0	0	+	0	+	0	0	0	+
Conflict reduction	0	0	+	+	+	+	0	0	+	+	0	0	0	+
Conflict machinery	0	0	+	+	+	+	0	+	0	+	0	0	0	+
Reduction of military use	0	0	+	+	+	+	0	+	0	+	0	0	0	cd
Prevention of expansion	+	+	+	+	+	0	0	-	+	0	0	0	0	+
Innocent passage	+	+	-	-	-	-	-	-	-	-	0	0	-	cd
Nonliving environment	+	-	+	+	0	+	0	0	+	+	0	0	0	+
International regime	+	-	+	+	+	+	+	0	0	+	+	-	0	0

TABLE 8-8
GOAL ADJACENCY MATRIX FOR THE OIL INDUSTRY

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Oil exploitation	0	+	0	0	+	0	+	+	-	0	-	+	-	-
Nodule exploitation	+	0	0	-	+	0	0	+	-	0	-	+	-	-
MSY (sustainable yield)	0	-	0	0	-	0	+	0	0	0	0	0	0	0
Nodule conservation	0	-	0	0	-	0	0	0	0	0	0	0	0	0
Scheduled development	cd	+	0	0	0	0	0	+	-	0	0	0	0	0
Fishery conservation	-	0	0	0	0	0	0	0	0	0	0	0	0	0
World protein	0	+	0	0	0	0	0	0	0	0	0	0	0	0
Conflict reduction	+	0	0	0	+	0	0	0	0	0	0	0	0	-
Conflict machinery	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Reduction of military use	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prevention of expansion	-	-	0	0	-	0	0	-	0	0	0	0	0	0
Innocent passage	+	+	0	0	+	0	+	+	0	0	0	0	0	-
Nonliving environment	-	-	0	0	-	0	0	-	+	0	-	0	0	0
International regime	-	-	0	0	-	0	0	-	0	0	-	0	0	0

TABLE 8-9
GOAL ADJACENCY MATRIX FOR THE GROUP OF JUDGES

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Oil exploitation	o	+	+	o	+	+	+	+	+	+	+	+	+	+
2 Nodule exploitation	+	o	+	+	+	+	+	+	+	+	+	+	+	+
3 MSY (sustainable yield)	+	o	+	+	+	+	+	+	+	+	+	+	+	+
4 Nodule conservation	+	o	+	+	+	+	+	+	+	+	+	+	+	+
5 Scheduled development	+	o	+	+	+	+	+	+	+	+	+	+	+	+
6 Fishery conservation	+	o	+	+	+	+	+	+	+	+	+	+	+	+
7 World protein	+	o	+	+	+	+	+	+	+	+	+	+	+	+
8 Conflict reduction	+	o	+	+	+	+	+	+	+	+	+	+	+	+
9 Conflict machinery	+	o	+	+	+	+	+	+	+	+	+	+	+	+
10 Reduction of military	+	o	+	+	+	+	+	+	+	+	+	+	+	+
11 Prevention of expansion	+	o	+	+	+	+	+	+	+	+	+	+	+	+
12 Innocent passage	+	o	+	+	+	+	+	+	+	+	+	+	+	+
13 Nonliving environment	+	o	+	+	+	+	+	+	+	+	+	+	+	+
14 International regime	+	o	+	+	+	+	+	+	+	+	+	+	+	+

8-9 stand for positive, negative, ambiguous, and curvilinear downward causal relations between variables. A curvilinear downward relation between goals x and y means that the realization of goal x facilitates that of goal y only if partial success is obtained in goal x; otherwise, goal y is blocked or impeded. This means that intermediate values of x result in high values of y, and extreme values of x (either high or low) result in low values of y. The curvilinear downward relation was included in this study because the group of judges consistently expressed a need for a curvilinear relation to supplement the monotonic positive and negative relations. After the curvilinear downward relation was explained to the group, they seemed satisfied that it would solve most of the problems they were having in estimating the causal beliefs of the actors. The fact that the group saw no need for using the curvilinear upward relation is interesting in itself, and could bear further study.

The group of judges was then asked to estimate the positions taken on each of the goal variables and the salience of the variable. The results, given in Table 8-2, correspond to the last column of the causal adjacency matrix of the cognitive map in Figure 8-1. The sequence of estimation—goal structure first and positions second—was thought to have a significant impact on the results. Considerable knowledge about the positions of the actors was gained in the process of estimating their goal structures.

At no time were the members of the group of judges informed of the three central hypotheses of this study. None of the members of the group had any previous exposure to graph theory or the analysis of cognitive maps. Nevertheless, the group knew that one of the purposes of the exercise was to use differences in cognitions to explain why certain actors favored an international ocean regime and others did not. Since the data here is purely judgmental, the separation of hypothesis and estimation was considered important. To allow for a test of the possibility that the group's estimates of perceived causal links were too clearly related to their personal estimates, the group was also asked to give their own ideas about the causal relations among variables (see Table 8-15 below).

The fact that the expert group's goal structure most closely resembled that of the United States may cast some doubt on the impartiality of the group. The fact that their goal structure more closely resembled the goal structure of the non-oil-exporting

developing nations than those of the oil industry or the oil exporters, however, suggests that this resemblance was more a function of the comparative densities of the structures than of ethnocentricity or differences of opinion on the sign of specific causal links. That is, most differences between goal structures involved the expert group's estimating a causal link where an actor does not. Thus there are several possible explanations for the variance among distances from the expert group's goal structure: (1) bias on the part of the expert group; (2) the density of the actor's goal structure; and (3) lack of information on the part of the expert group about the causal beliefs of the actor.

Several things may be done to increase one's confidence in the estimated goal structures: (1) the use of experts from a number of different countries; (2) the use of a more context-free method of estimating goal structures (see Roberts in Chapter 7); and (3) more extensive checks on the reliability of individual estimates. Each of these would have involved more time and expense than this trial study allowed. Nevertheless, it is believed that the use of experts to estimate the beliefs of international actors is both feasible and desirable for many research purposes. Transcripts of governmental strategy sessions are not always available. The actors are not always accessible for interviews. The probable alternative to the procedures used here would be to increase the number and variety of experts estimating goal structures, or to simplify the task by limiting the number of goal variables so that the time required of the actors, or their representatives, would be minimized.

The analysis of all the estimated goal structures will now be undertaken from both a separate and a comparative basis. The maps will be separately analyzed in terms of complexity, density, imbalance, and inconsistencies relative to subgraphs of salient goals; the analysis will allow a test of the first two hypotheses. The comparative analysis focuses on the patterns of similarities and differences between actors with respect to both their causal beliefs and their policy positions; the comparative analysis will allow a test of the third hypothesis. Throughout both analyses it will be assumed that the judges were accurate in estimating the actors' beliefs. The importance of this assumption will be re-examined in the section on "Explanations of Cognitive Inconsistencies."

ANALYSIS OF THE GOAL STRUCTURES OF THE SEPARATE ACTORS

The most striking feature of the goal structures estimated by the expert group is their relatively high complexity. They are not balanced; they are not acyclic; and they have relatively high density. The structures are too complex to be readily comprehended when presented in pictorial form. Even the structure with the lowest density, the oil industry's goal structure, has 66 of a possible 182 linkages, or 36 percent (see Table 8-10).

The first hypothesis can now be evaluated. The developed nations do indeed have relatively dense goal structures, as shown in Table 8-10. The United States, the Soviet Union, and the

TABLE 8-10
DENSITY OF GOAL STRUCTURES
(percent)

U.S.	USSR	OECD	Oil exporters	Other LDCs	Oil industry	Expert group
68	60	80	37	69	36	76

OECD states perceive causal linkages between the 14 goal variables at levels of 68 percent, 60 percent, and 80 percent, respectively. The Oil Exporters, on the other hand, perceive that only 37 percent of the possible linkages exist. The only anomaly is that the Other LDCs perceive more linkages than the two superpowers.

With only one exception (the Other LDCs) the density of substructures of highly salient goal variables is greater than the density of the whole structure (see Table 8-11). The substructures

TABLE 8-11
DENSITY OF SUBSTRUCTURES OF HIGHLY SALIENT GOALS
(percent)

U.S.	USSR	OECD	Oil exporters	Other LDCs	Oil industry
83	67	90	77	63	75

tures of the highly salient goal variables were, therefore, more dense than the substructures of less salient goals. Such a result suggests that the salience of goals is positively associated with the density of the goal structure. This conclusion may help to explain why the developing nations that do not export oil have goal structures with higher densities than was first expected. Even though they do not have great research capabilities, many of the goals included in this analysis were salient to them. A supplementary explanation would be that the Pardo proposal made them aware of more causal linkages.

Substructures of Salient Goals

In view of these findings of differences between the actors, as well as the initial investigation of the density of the goal structures, it is possible to proceed to test the second hypothesis about the tendency to hold positions that are consistent with beliefs. None of the goal structures in Tables 8-3 to 8-9 is perfectly balanced. This a rather unusual finding, for which explanations will be proposed. In any case, positions may be consistent only to a limited degree with goal structures that are not balanced. One kind of limited consistency will be explored by focusing on the substructures of highly salient goal variables (see Figure 8-2). These substructures are substantially more balanced than the entire structures, but there are still only two perfectly balanced substructures, those of the United States and the oil exporters.

Strangely enough, even though these two are balanced, the United States' substructure provides evidence that the positions taken on goal variables may be inconsistent with even *balanced* goal substructures. The United States should be either in favor of innocent passage and against both protection of the nonliving environment and reduced military use, or vice versa. Table 8-2 demonstrates, however, that the United States is for innocent passage and protection of the nonliving environment, while being against reduction of military use of the oceans. Possible explanations for this will be explored later.

The oil industry, on the other hand, has taken positions consistent with the substructure of its most salient goals: it favors oil exploitation, conflict reduction, and innocent passage, but opposes preventing the expansion of national jurisdictions. This opposition to limiting expansion, consistent with the perceived incompatibilities between preventing expansion and reducing conflict or increas-

ing offshore exploitation, has led the oil industry to take the same position on expansion that most of the developing nations have chosen. Some observers have commented on a possible alliance between the developing nations and the oil companies. Judging from the full range of goals and from perceived linkages, such an alliance is extremely unlikely unless limited to this issue.

The developing nations (minus the oil exporters) favor a maximum sustainable yield for fisheries, conflict reduction, and alleviation of world protein deficiencies, while opposing fishery conservation (primarily the position of fishing LDCs), innocent passage, and limiting expansion. The last two goals were both opposed despite the fact that they were perceived to be mutually incompatible. This inconsistency is partially a result of nationalist domestic pressures, and partly an indication of an inclination to bargain with innocent passage in order to get concessions from major powers to expand their national jurisdictions.

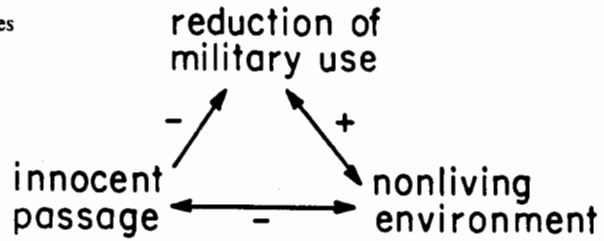
Other actors also permitted the existence of imbalance within goal structures and inconsistencies between positions and structures. The Soviet Union wants to prevent the expansion of national jurisdictions for reasons concerned with fishing. At the same time, it is fully aware of the possibility that preventing expansion may result in decreased willingness to allow military or scientific vessels to operate in national waters. Even so, they do not view innocent passage to be incompatible with the limitation of expansion of national jurisdictions. In these inconsistent perceptions, they are in perfect agreement with the United States, although the issue of preventing expansion is much less salient for the United States. The crucial question for the establishment of an ocean regime is whether the superpowers will be willing to trade some expansion of jurisdictions for guarantees of innocent passage. Although the superpowers share perceptions of the linkages involved, they do not consider the goals to be equally salient. This difference may impede efforts to negotiate, since the United States may be more flexible on the question of expansion than the Soviet Union.

For the oil exporters, the goals of high oil exploitation, scheduled development, establishment of conflict machinery, and reduction of military use of the oceans are all compatible. It is surprising, therefore, that the expert group believed them to be opposed to conflict machinery, while in favor of the other three goals. There is a substantial amount of asymmetry and inconsistency in the substructure, however, which could affect the choice of posi-

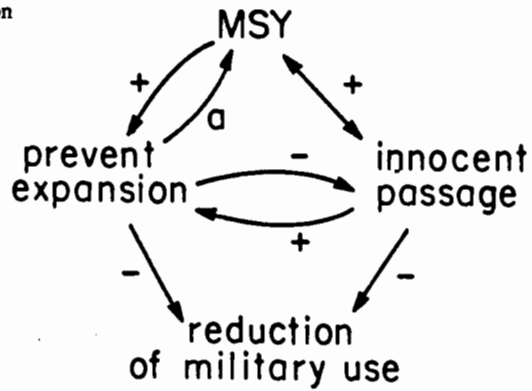
FIGURE 8-2.

Goal Substructures of Highly Salient Goals for Each Actor

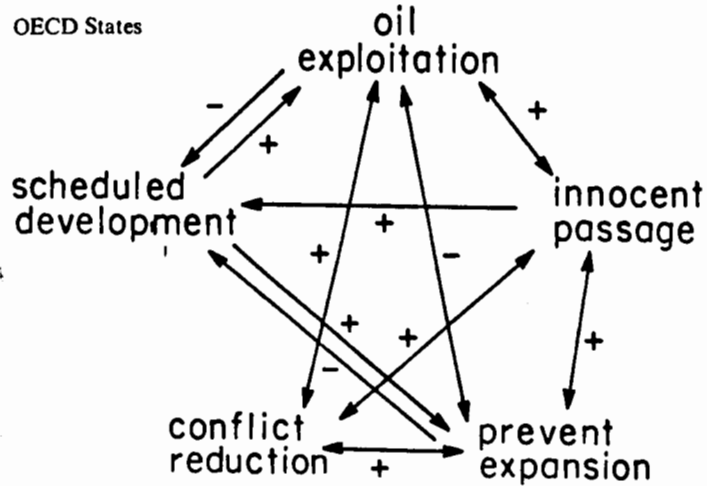
United States



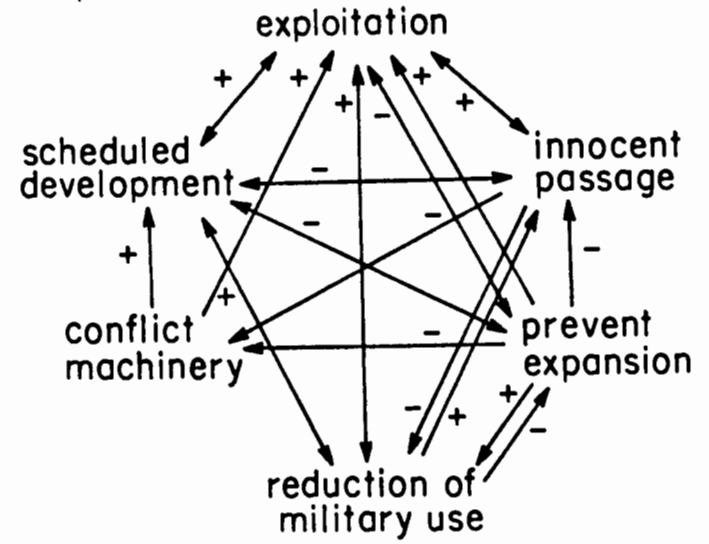
Soviet Union



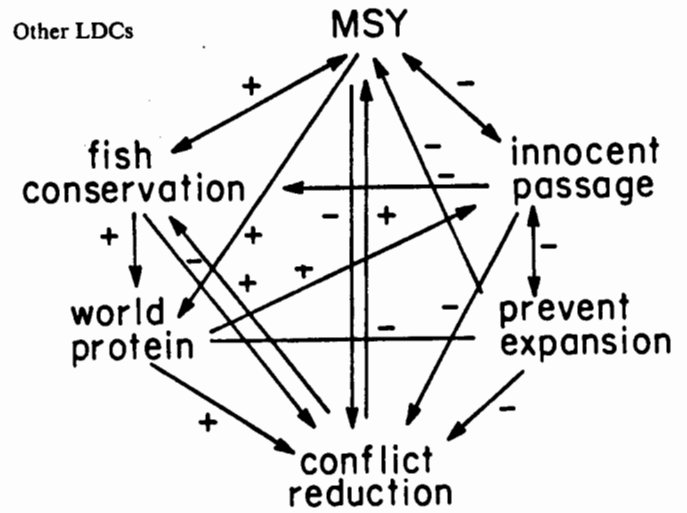
OECD States



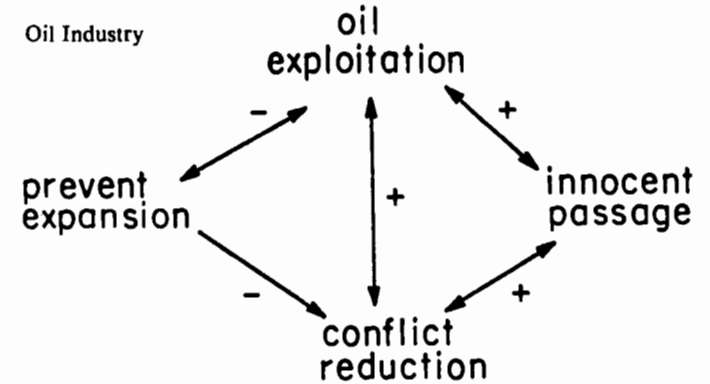
Oil Exporters



Other LDCs



Oil Industry



tions. Positive-negative pairs of linkages include those between oil exploitation and preventing expansion, oil exploitation and innocent passage, innocent passage and reduction of military use, and reduction of military use and preventing expansion. Several of these asymmetries may be attributable to conflicts between domestic economic goals and the foreign policy objectives of the Arab oil exporters. For example, the Arab oil exporters realize that preventing expansion may increase offshore oil exploitation. Even so, they preferred to deny the right of nations who sympathize with Israel to use their national waters, especially the Straits of Tiran and the Suez Canal. In addition, the oil exporters may believe that unregulated offshore oil exploitation will be of greater benefit to the oil companies or the major consumers than to them. Thus, they would like to convey to the rest of the world the idea that increased offshore oil exploitation can take place only in the context of expanded national jurisdictions.

For the OECD nations, a high degree of compatibility is perceived among the goals of conflict reduction, innocent passage, and preventing expansion. The incompatibilities that exist are due to the goals of scheduled development and oil exploitation. High oil exploitation means "scheduled development" for them, since their main domestic reserves are offshore, in the North Sea. They are opposed to what the United States and oil-producing states understand of scheduled development, which requires maintaining an approximately constant ratio between onshore and offshore reserves. Their opposition derived from the policy's implication of continued dependence on Middle East oil at levels that they would prefer not to maintain. They favor intensive offshore oil exploitation, not because it is compatible or incompatible with scheduled development, but because it reduces their dependence on oil imports. Although they believe that preventing expansion goes along with preserving innocent passage and reducing conflict in the oceans, they also believe, on the basis of North Sea experiences, that oil exploitation is inconsistent with limiting expansion. Yet, despite this perceived incompatibility, they take the position of favoring oil exploitation, preventing expansion, preserving innocent passage, and reducing conflict.

There is, generally, a tendency for actors to take positions consistent with the substructures of their most salient goals, but it is stronger for some actors than for others. In this study, the oil industry demonstrated the strongest tendency.

Explanations of Cognitive Inconsistencies

There is a number of possible explanations for imbalance and inconsistencies; yet reasons are generally found at two levels. First, there may be methodological errors in the research design. The most obvious is that the group of judges might not have accurately estimated the goal structures or the positions of the actors. They may have overestimated the complexity of causal beliefs of some actors, while underestimating the complexity of others. For example, the consistency of the oil industry's positions may be the result of the group's lack of information on the beliefs of the oil companies. They may have compensated for this lack of information by estimating what the oil industry's position *should be*, rather than what it is. This might bias their estimates in the direction of balance, which would increase the opportunity for inconsistencies between the goal structure and the position of a given actor. But notice, too, that lack of information about positions could also work to lessen observed inconsistencies if the judges let their estimates of an actor's beliefs affect their estimates of the actor's position, or vice versa.

Another possibility is that the actors consciously concealed their cognitions, making the accurate estimation of cognitive maps very difficult. It has been suggested above, however, that the attempt to convince others that a particular causal relation exists between two goals is an important part of the political process, especially in bargaining. Even if the actor does not really believe that the relation exists, he may be bound to behave as if it did.

Second, aside from measurement error or deception, and assuming the research design to be valid, explanations may be drawn from data based on other supporting evidence. The most convincing explanation of the inconsistencies uncovered is that nations simply do not feel strongly pressed to maintain positions that are consistent with their goal structures. On the contrary, they are often forced to take highly inconsistent positions for domestic political reasons, or to justify their positions by altering their causal beliefs, rather than vice versa. Alain Joxe (1966), in a pioneering article on the inconsistency of West German foreign policy objectives, was the first to suggest that a high level of inconsistency may result from domestic pressures. In a related work, Wolfram Hanrieder (1967, pp. 7-8) distinguished between "consensus," internal agreement on goals, and "compatibility," the logical consistency of a set of goals that is dependent on the condi-

tions prevailing in the international system. He hypothesized that consensus may be positively associated with compatibility. In other words, professing incompatible goals may make it difficult to win agreement for a particular set of policies. Since the West Germans were forced to maintain incompatible goals during the Cold War (e.g., the reuniting of Germany and the maintenance of the alliance with the United States) due to the bipolarized nature of the international system, they were bound to experience a certain amount of domestic dissension. Their ability to pursue incompatible goals during this period testifies to the ability of national actors to tolerate inconsistency.

Analysis at the national level indicates that the sources of inconsistency are various. Several sources suggested above were: the desire on the part of an actor to impress upon others a threat that certain undesirable consequences will result from the pursuit of goals that are contrary to its interests; pressure from domestic groups of various sorts to take positions that are not considered to be consistent with links between goals that are perceived by central decision-makers; and conflicts between primarily internal goals, such as economic development, and primarily external ones, such as pursuing a hostile policy toward another sector.

On the individual, cognitive level, the sources of imbalance and inconsistency may be differential abilities to process complex information or to tolerate imbalance and ambiguity. It may also be a function of differential levels of access to technical information. People who have a low tolerance for ambiguity are likely to perceive balanced goal structures and take positions consistent with those structures. People with greater access to technical information are more likely to have goal structures that take into account the most recent technological factors. These structures may be more or less balanced than those of individuals with less access to information, depending upon the nature of that information. For example, scientists at Woods Hole Observatory are more likely to know about the recent technological aspects of ocean drilling than government officials in Burma. Knowledge of these details may have an important effect on perceptions of linkages between oil exploitation and other goals. Since the goal structures and positions estimated above were imputed to international actors (generalized aggregates composed of numerous individuals), and since the individuals within each actor may have different levels of access to information and differential abilities to tolerate ambiguity, the goal

structure of the actor may be imbalanced because of the compromises that must be made among individuals in order to obtain an overall internal consensus.

Finally, it is possible that the nature of the situation contributes to the inconsistency between goal and positions. The oceans are used for a large number of purposes, many of which are in conflict with one another. Because of the increasing levels of usage and awareness that the oceans are part of a global ecosystem, ocean goals are becoming more interrelated. This high level of complexity and conflict among goals makes it harder for actors to decide on a consistent set of positions. The low salience of the ocean debate also contributes to the inconsistencies between goal structures and positions. Except during periods of crisis, such as the *Torrey Canyon* and Santa Barbara oil spills, the issues of ocean exploitation and preservation are not salient compared to domestic issues such as the health of the economy, the electoral process, or problems of succession. However, the low salience of the debate also creates opportunities for scientific and technical experts to affect policies by changing perceptions of links between goals. Scientifically informed perceptions may be less subject to over-simplification than perceptions based on the policy makers' experiences.

Comparative Analysis of the Goal Structures

The pattern of similarities and differences between actors will now be compared, first in terms of the beliefs that compose their goal structures. The resulting measure is called the "matrix distance" between two given actors because it is based on a comparison of the adjacency matrices of the goal structures of the actors. A second way to examine the pattern of similarities and differences between actors will be to analyze the positions they take for or against each of the goal variables. This will give a "position distance" measure for each pair of actors. The relationship of these two measures over the entire set of actors will allow a test of the third hypothesis, concerning whether alignments of convenience are likely to be alignments of perception as well.

Such comparative measures are important for three reasons. First, they augment comparisons of positions taken on the ocean regime. Second, they enable the analyst to estimate potential alignments. Third, they support predictions on outcomes in light of changing beliefs. Each of the two measures will be defined and

the computations involved explained. Tables showing results for each pair of actors will be presented. Finally, a comparison among the methods for validity and usefulness will be made.

Measuring Differences in Goal Structures

The matrix distance between two actors is a measure of the difference between the goal structures of two actors. It takes into account not only the number of causal links on which the actors disagree, but also the magnitude of each disagreement.

For example, a comparison of the United States to the Soviet Union illustrated the matrix distance measure. Each of the entries of the goal structures (Tables 8-3 and 8-4) were compared, and the results are summarized in Table 8-12. The range of the set

TABLE 8-12

AGREEMENT OF ENTRIES IN GOAL STRUCTURES: THE UNITED STATES AND THE SOVIET UNION

		United States					Total
		o	+	-	cd	a	
Soviet Union	o	57	8	6	0	1	72
	+	0	56	2	0	0	58
	-	1	0	42	0	0	43
	cd	0	0	0	6	0	6
	a	0	0	0	0	3	3
Total		58	64	50	6	4	182

of possible relationships is positive (+), negative (-), none (0), curvilinear downward (cd), and ambiguous (a). In two cases the Soviet Union perceived goals to be compatible that the United States considered incompatible. They were MSY (Maximum Sustainable Yield in fisheries) and preventing expansion; and innocent passage and MSY. In fifteen cases the United States perceived a linkage that the Soviet Union did not, and in one case the Soviet Union perceived a negative linkage not perceived by the United States. To determine the matrix distance between the goal structures of the two actors, the following weighting factors are used:

- (1) 0 = linkages are equal;
- (2) 1/2 = one linkage is curvilinear downward, and the other is positive or negative;
- (3) 1 = all unequal linkages, neither (2) nor (4);

(4) 2 = one linkage is positive, the other is negative. The matrix distance is computed by first determining the weighting factor for each pair of goal variables of the two actors. Then a summation of the weighting factors is made. For example, the matrix distance of the United States and the Soviet Union is $1 \times (8 + 6 + 1 + 1) + 2 \times (2) = 20$.

The second measure, position distance, compares two actors by concentrating on the positions of the actors over the entire range of ocean goals. This measure takes into account the salience of the goal for each actor and the magnitude of the difference between the positions of the actors on the goal. Position distance for a pair of actors is computed in the following manner:

(1) Each actor is given a score of from 3 to -3 on each goal, depending on support or opposition and salience:

- 3 = support, high salience
- 2 = support, medium salience
- 1 = support, low salience
- 0 = no position
- 1 = oppose, low salience
- 2 = oppose, medium salience
- 3 = oppose, high salience.

(2) Absolute differences between scores on the same goals for a given pair of actors were summed and divided by the maximum possible difference (in most cases, $6 \times 14 = 84$). For example, the absolute difference between the United States and the Soviet Union on oil exploitation is $|2 - 0| = 2$.

The results of the calculations for the two measures, matrix distance and position distance, are summarized in Tables 8-13 and 8-14. Using these results, it is possible to make a comparative

TABLE 8-13

MATRIX DISTANCE SCORES FOR EACH PAIR OF ACTORS

Soviet Union	20					
OECD	71	96				
Oil exporters	110	102	104			
Other LDCs	108	109	84	108		
Oil industry	112	106	107	74	140	
Group of judges	69	76	71	124	95	128
	U.S.	USSR	OECD	Oil ex- porters	Other LDCs	Oil indus- try

TABLE 8-14

POSITION DISTANCE SCORES (times 100)

Soviet Union	26				
OECD ^a	21	28			
Oil exporters	50	45	50		
Other LDCs ^b	60	47	54	40	
Oil industry	38	33	31	26	60
	U.S.	USSR	OECD	Oil ex-porters	Other LDCs

^a Since the OECD states differed among themselves on the issues of reducing military use and the international ocean regime, a range of scores was calculated and the midpoint used. An error factor of around 10 percent may be involved.

^b Since this actor's position on conflict machinery was not known, the total difference score was divided by 78 = (6 × 13) instead of 84.

analysis between the goal structures of pairs of actors. Before undertaking the comparative analysis, the relationship between the measures will be explored.

Examination of the results of the matrix distance and position distance measures shows that the scores generated by these measures tend to be positively correlated. The rank order (gamma) correlation between matrix distance and position distance is .46. The positive correlation is clearly shown in Figure 8-3. This result

FIGURE 8-3.

Possible Structures of Cooperation-Conflict in the Ocean Debate



Matrix Distance ^a
Position Distance ^b

^a Rules for drawing lines were:

- if matrix distance less than 75
- if matrix distance greater than 75 but less than 100

^b Rules for drawing lines were:

- if position distance less than 30
- if position distance greater than 30 but less than 38

supports hypothesis three, that actors with similar positions will tend to have similar beliefs about linkages between goals.

Comparison among Actors and Potential Coalitions

Given these relationships between the two measures, a comparative analysis of the actors can be undertaken. The objective of the analysis is to locate *groupings of goals* that could result in *coalitions of actors* on the issue of establishment of an ocean regime. The three pairs of actors with the lowest matrix distances are the same as the three pairs of actors with the lowest position distances: oil exporting nations and the oil industry; the two superpowers; and the United States and the OECD. This finding coincides with the results from the other measures. The pair with the greatest matrix distance, Other LDCs and the oil industry, also has a large position distance.

The relationships demonstrated by the measures of goal variables suggest that coalitions between the following pairs of actors may arise: the United States and the Soviet Union; the United States and the OECD; the oil-exporting nations and the oil industry.

It is not clear, of course, that actors will form coalitions purely on the basis of shared perceptions of causal linkages between goals. For example, if two actors perceive the same negative linkage between two goals, they may take opposite positions on both goals because their underlying interests are opposed. Both oil companies and fishermen may see offshore oil exploitation as incompatible with fishing, but the oil companies will favor exploitation over fishing, and the fishermen will oppose oil exploitation. Thus shared perceptions may actually enhance the likelihood of conflict if a real conflict of interests exists.

One fact that can be derived from Table 8-2 is that the ocean debate is not unidimensional. There are several goals, for which actors tend to divide into opposing groups in different ways. For example, on the issue of innocent passage, it is the oil exporters and the Other LDCs versus all others. On the other hand, on oil exploitation the oil exporters join with the developed nations in favor of offshore oil, with only the Other LDCs opposed. On fishery conservation, the Other LDCs share the Soviet Union's view that conservation is undesirable. There are, therefore, opportunities for the creation of issue-specific alliances between developed and developing nations. The total pattern of alignments could be cross-cutting and nonpolarized.

Possible Determinants of Support for an Ocean Regime

Analysis of the data and definitions for comparative measures of the separate actors' goal structures provide the preface for a more detailed analysis of the primary concern, establishment of an international ocean regime. In that regard, the present considerations will include a presentation of separate actors' views toward the establishment of an ocean regime. Table 8-15 presents: the position of each actor on the establishment of such a regime; the salience of this goal for each actor; the distance of the goal structure of each actor from that of the judges; and the structural influence of the regime.

TABLE 8-15

RELATION BETWEEN POSITION TOWARD INTERNATIONAL OCEAN REGIME AND OTHER STRUCTURAL MEASURES FOR EACH ACTOR

	U.S.	USSR	OECD	Oil ex- porters	Other LCDs	Oil in- dustry
Position ^a	+	-	a	o	+	-
Saliency ^a	med	low	med	low	high	high
Distance from judges ^b	69	76	71	124	95	128
Symmetry ^c	.95	.72	1.06	.44	1.06	.86
Structural influence ^d	.01	.03	-.02	-.01	.01	.05

^a See Table 8-2.

^b Distance of goal structure from the estimates of the group of judges: see Table 8-13.

^c The number of positive and negative linkages between pairs of goals divided by the number of positive-nil and negative-nil asymmetric linkages.

^d In computing this measure for the ocean regime goal, I considered all non-nil linkages to be the same. Thus, all signs were ignored. See text for an explanation of the structural influence measure.

As Table 8-15 illustrates, the United States supported the goal of establishing an ocean regime with a moderate saliency, while the other LDCs were supportive of the issue, which had high saliency for them. The OECD states demonstrated ambiguous feelings and moderate saliency, while oil exporters had no opinion. The major opponents to a regime are the oil industry, the Soviet Union, and some OECD states. Can opposition or indifference

to an international ocean regime be explained in terms of other characteristics of the goal structure than its density or balance?

Table 8-15 shows that opposition to an international ocean regime is associated with the perception of asymmetric linkages, distance from the judges' goal structure, and a high estimate of the causal independence of the ocean regime. The two actors with the greatest distance from the judges' goal structure, the oil exporters and the oil industry, actively oppose or do not favor the regime. The three lowest scores on a symmetry index correspond to the three actors who least favor an international regime. The two main opponents of the regime, the oil industry and the Soviet Union, are also the actors that give the regime the highest scores in terms of "structural influence." The measure of structural influence is an indicator of the ability of a specific goal variable, in this case the international ocean regime, to affect other goal variables, both directly and indirectly, without being affected by them (Taylor 1969). Thus, even though the ocean regime affects many of the other goal variables for the United States, the structural influence of the regime is low because it is affected by a large number of the other variables.

Having completed this detailed analysis of the cognitive maps, I would now like to describe what took place at the Caracas Conference on the Law of the Sea. This description will aid in evaluating of the cognitive map technique as a way of understanding the ocean debates.

WHAT HAPPENED IN CARACAS?

More than 5,000 delegates and observers from 148 nations attended the Caracas Conference.⁹ Although there was some dispute over the failure to invite the Vietcong and Taiwanese representatives, the delegates soon got down to the business at hand. The range of issues discussed closely resembled those listed in Table 8-1, with a few important exceptions. Limiting the expansion of national jurisdictions was divided into two subissues: (1) setting a limit on the width of the "territorial sea"; and (2) setting a limit

⁹ This description of the Caracas Conference is based on journalistic accounts in the following sources: *New York Times*, June 21, 1974, p. 12; July 2, 1974, p. 8. *The Times* (London), August 19, 1974, p. 5; August 20, 1974, p. 4; August 25, 1974, p. 3. *The Economist*, June 22, 1974, pp. 28-30; July 20, 1974, pp. 39-40.

on the width of a wider "economic zone." Most versions of this compromise called for national control over fishing and mineral exploitation in the economic zone and over navigation and scientific research in the territorial sea. However, Canada, Iceland and most of the developing nations favored extending national control over pollution and scientific research to the economic zone. Most nations came to the conference willing to settle for a 12-mile territorial sea and a 200-mile economic zone, with the notable exceptions of Japan and the Soviet Union. This created new difficulties, since the wider territorial sea meant that certain straits, including the Straits of Gibraltar and Malacca, which had previously been open to all navigation, could theoretically be closed by coastal states. The United States, Britain, and the Soviet Union therefore called for "unimpeded passage through straits." Unlike innocent passage, unimpeded passage does not require submarines to navigate on the surface and to show their flag when passing through another nation's territorial sea. This surfacing procedure would make it impossible for the superpowers to conceal the movement of their submarine fleets.

The nature of the regime (or regimes) that would be responsible for the regulation or exploitation of the international part of the oceans (the area beyond the economic zones) was a matter of considerable disagreement, both before and after the conference. A number of developing nations, including the People's Republic of China, favored a strong authority which, by entering into joint ventures, would itself develop ocean resources for the benefit of all nations. The United States and the European Community nations wanted the authority to be limited to the licensing of private or public enterprises, with the licensing revenues to be distributed to all nations.

Formation of coalitions was not as marked as one might have expected from the analysis above. Although there was clearly a split between major powers and developing nations on the issue of national control over the economic zone and passage through straits, that debate and the debate over the international regime saw divisions within both groups. For example, the British and the Soviets were opposed to even a limited licensing authority, while the developing nations with onshore mineral resources were opposed to a strong regime because of the expected effect on world prices. Canada and Iceland took strong stands in favor of the control of pollution in the economic zone. Lobbying by commer-

cial interests was extensive both before and during the conference. Nevertheless, the oil industry and the oil-exporting nations played a much smaller role than expected in the debate because of the initial consensus on the expansion of national jurisdictions. A strong division between the landlocked countries and others did not materialise. The thirty-one landlocked nations tied their hopes to the proposal for a strong international regime, effectively allying themselves with the developing nations.

The next session of the conference will probably focus on a compromise in which a stronger international regime is traded for guarantees of free passage through straits and outside the territorial sea. The number of alternatives on other issues was considerably decreased in the Caracas meeting, so the agenda will be less filled with items for discussion.

Also, the Caracas meeting agreed on a voting formula by which the required majority will be two-thirds of those voting yes or no, so long as those voting yes include at least half of the participants. So the outlook for the successful conclusion of an agreement on a new law of the sea is good, as long as there is a chance of resolving the issues of: (1) the distinction between the territorial sea and the economic zone; (2) unimpeded passage through straits; and (3) the nature of the regime for the exploitation of the international part of the oceans.

SUMMARY OF RESULTS AND EVALUATION OF THE COGNITIVE MAP TECHNIQUES

Given the events in Caracas as described above, it becomes possible to say something about the utility of the technique. Some vital elements of the debate were reflected in the estimation of cognitive maps. Actors did tend to rationalize their positions on the basis of connections between issues. A good example is the issue of economic zones that include national control over pollution and scientific research. Nations favored such control, not because of their irrational nationalistic tendencies, but primarily because they believed such control necessary for the management of coastal fisheries or the regulation of offshore oil exploitation. Nations that opposed this control were concerned that strict pollution control might limit the access of merchant and military fleets to the economic zones.

Several rather important shortcomings of the analysis were evi-

dent, however. First, and probably most important, the study did not take into account the variety of *types* of regimes that would be under discussion. The group of judges looked at a regime that resembled the most ambitious proposal put before the Caracas Conference. A separate analysis for each type of regime proposed would have been desirable, and certainly would have improved the descriptive and explanatory value of the exercise. Second, the issues changed over time in ways that were not foreseen. For example, the research group did not foresee the division of national jurisdictions into territorial seas and economic zones. They did not foresee the development of the idea of unimpeded passage as an alternative to innocent passage. Third, some issues, like the alleviation of world protein deficiencies, did not obtain the prominence that was expected.

In the absence of a detailed description of the Caracas Conference in terms of cognitive maps, it is impossible to evaluate systematically the technique's descriptive accuracy. Nevertheless, it clearly failed to take into account changes in the issues, and perhaps the beliefs of the participants. However, it did yield several hypotheses or conjectures about cognition that may be of general interest: (1) positions of actors may be inconsistent with causal beliefs about linkages between goals when the actor is a nation-state, because of domestic pressures, bargaining behavior, compromises within the government, and the differential ability of individuals to tolerate ambiguity; (2) actors with similar positions tend to have similar beliefs; (3) actors tend to perceive more linkages between highly salient goals than between less salient ones; and (4) in a situation of high complexity and ambiguity, actors may favor a policy that they perceive to have low causal independence more than one that promises to have a direct effect on several issues without being subject to feedbacks.

These hypotheses, if backed by further empirical study, could help to improve the utility of the technique as an explanatory and predictive, as well as descriptive, device. That is, one could begin to explain *why* nations take the positions they do or *why* they choose specific coalition partners in terms of cognitive maps. This would make it possible to suggest ways in which positions or alignments may be changed by the judicious mustering of facts and evidence about the linkages between goals. If, for example, it is true that actors with highly connected maps prefer policies with low causal independence, and if one would like to see a particular

policy implemented, then one would presumably want to encourage the view that the policy will be subject to a lot of feedbacks. Similarly, if one is merely interested in obtaining agreement or consensus among a group of actors, one should encourage the actors to harmonize their beliefs about causal linkages. Finally, one could change the position of some actors by manipulating the salience of issues. These are procedures that would probably not occur to anyone without exposure to the use of cognitive maps. It is precisely this potential for generating accurate descriptions, rational explanations, and new (and even counterintuitive) propositions about persuasion and consensus-building in situations with actors of highly divergent political perspectives that recommends the cognitive mapping technique for further study.

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