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THE COGNITIVE STRUCTURE OF INTERNATIONAL BARGAINING

A Cognitive Mapping Analysis of the pre-Munich
Talks Between Hitler and Chamberlain

by

August H.M. Behne, B.Soc.Sc.

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A Thesis submitted to the Faculty of
Graduate Studies and Research in partial
fulfilment of the requirements for the degree of
Master of Arts
in International Affairs

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ABSTRACT

The study examines the cognitive structure and dynamics underlying the bargaining behavior of the leaders of two major nations in a conflict setting. Two cognitive maps constructed from coded minutes are analyzed for conceptual variety, structure, centrality and inference. The relationships and propositions derived from the results are discussed and explored for explanatory power. Subgraphs of concepts with high cognitive centrality best reflect each leader's relevant belief subsystem and thrust of argument. Cybernetic analysis was found to be more sensitive to policy choice than previously used methods. The theory potential of the approach is evaluated and policy relevance is demonstrated by a cognitive mapping explanation of the Munich outcome. The study broadens the existing research field by analyzing documentary material from a summit crisis confrontation.

TABLE OF CONTENTS

1. INTRODUCTION	Page
2. THEORY	
2.1 Structure and Perception in Foreign Policy	3
2.2 Cognitive Mapping	4
2.3 The Place of Cognitive Mapping in I.R. Theory	10
2.4 Origin and Development of Cognitive Mapping	13
2.5 Review of Selected Cognitive Mapping Studies	18
2.6 Claims Made for Cognitive Mapping	22
3. METHOD	
3.1 Choice and Purpose of the Test Study	25
3.2 Conventional Summary of the Coded Text	27
3.3 Coding	34
3.4 Reliability	37
3.5 Treatment of Raw Coded Data and Map Construction	38
4. RESULTS	
4.1 Enumerative Analysis	53
4.2 Utility Analysis	56
4.3 Central Concept Analysis	57
4.4 Causal Path Analysis	63
4.5 Cybernetic Analysis	68
5. DISCUSSION	
5.1 Findings	73
5.2 Cognitive Style	81
5.3 The Dependent Variable	82
5.4 Validity	85
6. ASSESSMENT	88
7. CONCLUSIONS	94
BIBLIOGRAPHY	97

TABLES

		Page
1	Source Text and Cognitive Elements	53
2	Distribution of Concept Types Plotted	54
3	Distribution of Linkage Valences and Types of Asserted Effect	55
4	Cognitive Centrality of Individual Concept Variables	59
5	Mean Concept Category Centrality	60
6	Weighted Concept Category Centrality of Critical Central Concepts	69

FIGURES

1	A simple causal assertion or belief, taken from the cognitive map of Hitler	7
2	Example of a causal path	8
3	Example of an indeterminate, or imbalanced, graph taken from Hitler's cognitive map	9
4	Cognitive map of Adolf Hitler	45
5	Cognitive map of Neville Chamberlain	49
6	Goal structure from Hitler's cognitive map	57
7	Goal structure from Chamberlain's cognitive map	58
8	Highlighted critical subgraph of Hitler's cognitive map	61
9	Highlighted critical subgraph of Chamberlain's cognitive map	62
10	Cyclical cognitive subgraph from Hitler's map	65
11	A series of feedback loops or cycles	66

1. INTRODUCTION

The broad aim of this study is to add to the knowledge of how policy makers understand the international environment and how this understanding is reflected in their decisions. The research method employed is cognitive mapping. This is a graphic representation of the cognitive process operating in a particular policy-making situation, much like a superimposed series of snapshots of mental circuitry in action.

Cognitive mapping is based on the assumption that it is possible to infer cognition from linguistic behavior and ultimately behavior from cognition. Because the human mind is indivisible, both language and action are motivated by the same belief system and the same intentionality which inform cognition.

The mind of the policy maker also does not act as a mere passive filter of the environment, with the result that *"there are no such things as 'facts'". There are only messages filtered through a changeable value system*" (Boulding, 1956: 14).

The researcher interested in explaining policy-making therefore needs to identify the cognitive dynamics which intervene between the receipt of information and the choice of a policy, and one way of doing this is to analyze the structural properties of cognitive maps.

The literature on cognitive mapping contains a valuable body of assumptions, methodologies and findings, which are presented here for the purpose of evaluating the approach on

the basis of existing work.

In a second part of this study, the pre-Munich conversations between Adolf Hitler and Neville Chamberlain are used to construct two cognitive maps for the purpose of testing previous findings and claims, and of extending cognitive mapping methodology to the analysis of diplomatic bargaining.

Because the approach is based on a methodology rather than on a set of axioms, the research strategy must be inductive. The plan adopted is to carry out a broadly based analysis designed to capture the largest possible number of patterns and characteristics. The maps will be analyzed from five different analytical perspectives and the results obtained will then be examined for new findings and explored for new propositions to be tested in future work.

An attempt will be made to demonstrate the potential, policy relevance of cognitive mapping by using some of the relationships and propositions identified in the course of the analysis to explain the behavior of the two leaders, the dependent variable.

Following an appraisal of the analytic power of the approach and an assessment of its theory value, it will be argued that in spite of some severe practical and methodological limitations, the cognitive mapping approach must be regarded as a fundamental research method of considerable potential.

2. THEORY

2.1 Structure and Perception in Foreign Policy

An important watershed which continues to divide international relations theorists is the debate about the ultimate source of state action. The proponents of approaches using structural variables insist that decision makers are prisoners of the imperatives of objective factors, while those using perceptual variables claim that policy is shaped by subjective perceptions of reality.

While the descendants of Humean epistemology appear to be gaining some ground, perhaps because Western liberalism has provided a fertile soil for egocentric analysis, the debate continues unresolved. The logical place to look for an answer to this key question would seem to be the locus of cognition itself, the mind of the policy maker. If it were possible to isolate and to trace the path of cognition from stimulus through to response, we could research the relative contribution of objective structural and subjective perceptual factors to decision output. A recently developed methodology which seeks to do just that is cognitive mapping.

This approach is predicated upon the assumption that, "even though the actual thought process of foreign policy decision-making tends to be accounted for, correlated with, or predictable from structural variables, thinking process must always be involved. Thus, a change in thinking will

have to result in different outcomes" (Bonham and Shapiro, 1977b: 2).

Structural variables are objective factors. To bring their full weight and value to bear on a given decision-making problem, they must be reflected in the decision calculus with mathematical rigor. But as numerous studies have shown, this is not very often what is happening in foreign policy. The so-called "rational choice" model of decision-making is subject to a number of important limitations.

The existence of cognitive constraints on rationality is one of these. It is well established in the literature on decision-making and takes its place alongside such factors as group dynamics, organizational norms, standard operating procedures and bureaucratic politics (Holsti, 1976: 18-19).

Because of these constraints on rationality, the mechanisms which people use to receive and process information about their environment become the focus of interest for the researcher trying to find out how structure is translated into perception. One of the most important of these mechanisms is the belief system.

2.2 Cognitive Mapping

Cognitive mapping is just one approach to the study of belief systems, but because it focuses on causal beliefs and values and their structural relationships, it is especially suitable to the study of the means-ends arguments people use

when they try to evaluate policy alternatives (Axelrod, 1976: 222). It reflects the proposition that decision makers tend to believe that international events are causally related and thus try to infer causal relationships underlying events and the actions of other nations, even when there is little or no evidence of a causal nature (Shapiro and Bonham, 1973: 163).

A belief, in its simplest form, is a specific relationship, held to be true, between two concepts. A number of such concepts linked by interconnecting beliefs constitute a belief system. The term *cognitive map* is used as a synonym for belief system when special emphasis is placed upon the structure of the set of beliefs (Axelrod, 1972a: 5-6).

Axelrod (1976: 55) defines a cognitive map as "a specific way of representing a person's assertions about some limited domain, such as a policy problem. It is designed to capture the structure of the person's causal assertions and to generate the consequences that follow from this structure."

Because it is confined to a limited domain, a cognitive map is a representation of a subset of an individual's belief system. Generally, this subset concerns a policy issue. Thus, a cognitive map neither portrays the full range of an individual's belief system, nor even all of his relevant political beliefs.

The basic elements of a cognitive map are concepts and links, or beliefs. Concepts are verbal labels attached to elements of thinking (George, 1959: 2). Beliefs are assertions

about the causal or value relationships thought to exist between concepts. When these two elements are translated into symbols and represented in graphic form, the structural properties of a given set of beliefs emerge.

Concepts, as used in cognitive mapping, must be variables. They must be capable of taking on different values and may be *continuous* (degrees of security), *ordinal* (more or less security), or *dichotomous* (existence or non-existence of security) (Axelrod, 1976: 59).

In addition to causal assertions, certain types of value assertions are coded. These are concept variables which represent the utility of one of the actors involved in the particular event or setting being examined. Axelrod (1976: 59) defines *utility* as "the unspecified best interests of an actor, such as a person, organization, or nation."

The system of graphical representation used in cognitive mapping derives from the theory of directed graphs. This is a mathematical system with an elaborate set of rules which was designed to describe and analyze the structural properties of empirical phenomena (Harary *et al.*, 1965).

Axelrod (1972a, 1976) has adapted some of the basic elements of this system for cognitive mapping: a signed directed graph, or *signed digraph* for short, consists of points connected by directional lines, or arrows, which have a valence. The points represent concepts and the arrows represent the relationship believed to exist between a given pair of points.

The arrow's valence identifies the value of the relationship. A positive valence means that any changes occurring will be in the same direction, a negative valence means that they will occur in the opposite direction.

Fig. 1: A simple causal assertion or belief, taken from the cognitive map of Hitler.

While the most common relationship values are positive and negative, Axelrod (1976: 344) has expanded these into a logically complete set of eight different values:

- + positive
- negative
- 0 zero
- ⊕ nonnegative, i.e. (0,+)
- ⊖ nonpositive, i.e. (0,-)
- ≠ nonzero, i.e. (+,-)
- u universal, i.e. (+,-,0)
- a ambivalent, i.e. the empty set.

If it were possible to code causal or value relationships consistently in quantitative terms, for example by specifying that a given change in variable A results in three times as much change in variable B, the effects of interrelationships could be calculated. Relationships could then be

expressed in functional terms. But since decision makers rarely use expressions that indicate more than the direction of the change they believe will occur, doing so would violate one of the cardinal rules of measurement, which forbids the use of a scale whose precision is greater than that of the measured values. This is why cognitive mapping uses signed digraphs rather than weighted or functional digraphs to represent belief systems (Axelrod, 1976: 68-72). One of the benefits of this is greater ease of analysis, but it also frequently produces indeterminate total path effects and graphs that are said to be *imbalanced*.

Two or more assertions which are linked by common concepts, i.e. where the effect variable of one becomes the cause variable of the other, are called a causal path. A path, such as the following,

Fig. 2: Example of a causal path.

transmits an indirect effect; $A \rightarrow B \rightarrow C = A \rightarrow C$. Indirect effects are calculated from direct effects by multiplication according to the following rules (Axelrod, 1976: 345):

1. Positive times anything is that thing.
2. Zero times anything is zero.

3. Ambivalent times anything (except zero) is ambivalent.
4. Negative times negative is positive.
5. Multiplication distributes over union.

Sometimes, two points in a cognitive map are connected by two or more separate and different paths:

Fig. 3: Example of an indeterminate, or imbalanced, graph taken from Hitler's cognitive map.

In this case, the *total effect* of the different paths from the first cause variable to the last effect variable is calculated by addition, using a set of standard rules (Axelrod, 1976: 64, 346). In the above example, the indirect effect of one path is negative (+·+·-) and that of the other positive (+·+). The total effect of the first point (*Right of self-determination*) on the last point (*German utility*) is therefore indeterminate, and the graph is said to be *imbalanced*. If all the indirect effects operating between two points have the same sign, the graph is said to be *balanced*.

Some cognitive maps contain causal paths with arrows

connecting their last point back to their first point. These are called *cyclic graphs* or *cycles* and represent feedback loops in the cognition process.

Cognitive mapping is based on what George (1959: 9-10) calls nonfrequency analysis. This procedure is more flexible than quantitative content analysis because it does not specify the actual words or word clusters to be examined but permits a search for the intended meaning, thus taking into account the situational and behavioral context of the communication (George, 1959: 27). It also has the important advantage of employing the concepts used by the decision maker himself.

The methods used for deriving cognitive maps are based on the coding of transcripts and documents or questionnaires and open-ended interviews. Since it is highly desirable that the method of collecting the source material be as unobtrusive as possible, interviews and questionnaires present a problem: they intrude into the setting as a foreign element, and they create attitudes as well as measuring them; they elicit atypical roles and responses, and they are limited to those who are available and willing to cooperate (Webb *et al.*, 1966: 1). This reactive or "guinea pig effect" of measurement is largely avoided in the documentary coding method.

2.3 The Place of Cognitive Mapping in I.R. Theory

Methodologically, cognitive mapping research falls into the area of decision-making analysis. Snyder *et al.* (1955: 65)

broke new ground when they suggested that "state action is the action taken by those acting in the name of the state." This perspective led analysts to attempt to reconstruct the decisional situation as it was perceived by the decision maker. They now assumed that state behavior can be understood when it is known how the official decision makers subjectively defined the situation which gave rise to their decisions. The individual decision maker had become the unit of analysis and the emphasis was on perceptual variables.

Kirk (1976: 85) defines perceptions as the totality of traits and attributes a person gives to a particular object, person, or situation (or all three) at a particular point in time. Perceptual approaches assume that the "real world" is relative and subject to the colorations that each individual attributes to it (Kirk, 1976: 5). They assume that a perception is a product of both internal influences (socialization, personality, attitudes, values and beliefs) and external influences (situational and contextual variables) (Kirk, 1976: 7-9).

Perception is one of the first steps in cognitive processing and decision-making. Images and perceptions, or belief structures, perform a filtering process. They integrate the incoming information and orient the observer towards viewing an object or situation in a certain manner (Kirk, 1976: 18).

Cognitive mapping research as a theoretical approach

seeks explanations of the cognitive dynamics which occur when an individual receives information about an international event, processes it through his belief system and reaches a conclusion about what has happened and what should be done by his nation (Shapiro and Bonham, 1973: 148).

Stein and Tanter (quoted in Brecher, 1977: 54-55) designed a process model of choice in which they employ the analytic, cognitive, and cybernetic paradigms. This model, which reflects recent assumptions in the field of decision-making analysis, clearly shows that belief structures occupy a central position. Bonham and Shapiro, who have done major work in cognitive process research, state that "the major theoretical presupposition of our model is that beliefs of foreign-policy decision makers are central to the study of decision outputs and probably account for more of the variance than any other single factor" (Shapiro and Bonham, 1973: 161).

Traditional approaches to decision-making tended to rest upon a radical separation of the "event" and the decision maker. Cognitive mapping research assumes that there is no "event" until the decision maker constitutes it by selecting out aspects of the environment for special attention (Bonham and Shapiro, 1977b: 6).

Events have natural boundaries only within the context of the old referential theory of meaning, a theory which assumed that the meaning of a concept is exhausted by the objects to which it refers. If we assume that part of the

meaning of a concept inheres in the way it is being used, the boundaries which create events come from the conceptual system of those who speak of the event (Bonham and Shapiro, 1977b: 6).

Events are linked to the past by the person's subjective history of past events, and they are linked to the future by his expectations about the likely chain of events to come (Bonham and Shapiro, 1977b: 7).

2.4 Origin and Development of Cognitive Mapping

Cognitive mapping as a theoretical approach to the study of foreign-policy decision-making was developed by Robert Axelrod (1972a). The methodological background as well as the theory context are available in detailed reviews of image and perception theory published by Elizabeth Kirk (1976) and of cognitive approaches by Ole Holsti (1975, 1976).

Axelrod's point of departure was the assumption that a decision maker has to simplify the complexities of the external world. He must be able to construct a manageable representation of his environment before he can make reasoned decisions. Such a representation includes beliefs about how possible choices will affect potential outcomes. However, the linkage between choice and outcome is usually indirect: a certain choice leads to certain consequences, which in turn will have certain repercussions that produce certain effects. In order to reconstruct and understand the decision-making process, it is therefore necessary to examine the whole

structure of the concepts and linkages that are used to establish the effect of choice on outcome (Axelrod, 1976: 78).

Axelrod's (1972b: 78) initial research question was: "What methods does a policy maker use to cope with the large number of causal connections that can occur among the set of concepts relevant to a given proposal?" He treated the problem as a mathematical one and examined two methods for the best prediction of a new case: linear regression and closest point estimation (Axelrod, 1972a: 30-31). He found that the latter, while being cumbersome in many respects, does provide an advantage over linear regression in cases where (1) computation is difficult, (2) the number of cases is small, and (3) the number of independent variables is large, conditions which are typically present in international relations. In closest point estimation, when a person observes the independent variables of a new case, he merely has to scan the old cases to see which old case is closest to the new one. Then he predicts that the value of the dependent variable in the old case will be the same in the new case (Axelrod, 1972a: 31). Axelrod (1972a: 32) noted that people indeed often use historical analogies and often draw general lessons from specific cases. "The case of Munich, for example, is still used as a predictor of what will happen if illegitimate demands are acceded to under pressure."

A further research question arising from this finding

is how people use experience to form and reform their beliefs (Axelrod, 1972a: v). Because of the motivational pressures and the psychological needs that affect the decision maker in most situations, cognitive imbalance, or dissonance, is a factor that could not be neglected. For this reason, elements of psycho-logic were introduced into cognitive mapping analysis. Psycho-logic is a set of rules proposed by Abelson and Rosenberg (1958: 4-5) to explain how people deduce new attitudes by combining two old ones with an element in common. For example: A (-) B and B (-) C implies A (+) C. Translated into verbal form, this deduction is not necessarily logical at all. Example: India (A) opposes (-) U.S. Far Eastern policy (B). U.S. Far Eastern policy (B) is directed against (-) Communism (C). Therefore, India (A) is in favor of (+) Communism (C). Abelson and Rosenberg admit that such "reasoning" would mortify a logician, yet it can be found in much this form inside of millions of heads (Abelson and Rosenberg, 1958: 5).

In order to render the structural properties of concepts and linkages and their interrelationships in graphic form, some of the elements and mathematical ideas of digraph theory (Harary *et al.* 1965) were adopted for cognitive mapping.

In cognitive mapping, the researcher starts with linguistic behavior and makes inferences about cognition (Axelrod, 1976: 10). The overall research strategy used by Axelrod is to base what is being measured on what is being

asserted rather than on what is being thought by a person. A valid cognitive map therefore does not necessarily have to be consistent with the person's private beliefs (Axelrod, 1976: 6).

While the scientific researcher analyzes relationships in terms of correlations or covariation, most people tend to think in terms of cause and effect. The notion of causation is vital to the process of evaluating alternatives, and regardless of the philosophical difficulties involved in the meaning of causation, Axelrod says, people do evaluate complex policy alternatives in terms of the effects of a particular choice, and ultimately of the sum of all these effects. Indeed, such causal analysis is built into our language, and it would be very difficult for us to think completely in other terms, even if we tried (Axelrod, 1976: 5). This is why cognitive mapping is based exclusively on assertions of causality and of value, the latter being beliefs about the utility or disutility of a concept variable to an actor.

Limiting cognitive mapping to causal imagery provides three advantages: reliability (if additional types of assertions were allowed, coding uniformity would be reduced), inferability (the extent to which conclusions can be derived: $A+B$ and $B-C$ equals $A-C$; other types of relationships would make this type of inference much harder), and comparability (between different types of maps or different sources) (Axelrod, 1976: 260).

The following three disadvantages are also partly due to the exclusive use of causal imagery:

There is no way of accommodating conditional or *interactive causation*. For example: if A is high, B promotes C; but if A is low, B retards C. The same holds true for *non-reversible causation*: an increase in A causes an increase in B; but a decrease in A does not cause a decrease in B. (Lighting matches causes forest fires, but putting out matches does not put out forest fires.) Nor is it possible to handle *non-monotonic causation*: for some values of the cause variable an increase will yield an increase in the effect variable, while for other values of the cause variable an increase will yield a decrease in the effect variable (Axelrod, 1976: 260-261).

With respect to method and procedures, Axelrod (1976: 6) specifies four requirements for the use of cognitive maps in decision-making studies:

1. The methods of obtaining the research data should be unobtrusive.
2. Concepts and causal links should stem from the data and not from any *a priori* assumptions of the researchers.
3. The derived cognitive map should be closely tied to an evaluation theory of decision-making, so that it can be used to advise and even to criticize the decision maker.

4. The method should be valid, i.e. the map should be an accurate representation of the assertions used by the decision maker.

2.5 Review of Selected Cognitive Mapping Studies

In order to determine how the cognitive mapping approach has been applied in empirical research, a representative selection of ten studies was examined.¹ Two main analytical approaches emerged from this review: a structural approach, represented by Axelrod, Hart, and Ross, and a cognitive process approach, represented by Bonham and Shapiro. A single study by Roberts offers a third approach, in which a cognitive map is used as a model for testing various policy scenarios.

Because the two principal approaches differ in the nature of their data requirements, they tend to use different

¹ Robert Axelrod, "Decision for Neoimperialism: The Deliberations of the British Eastern Committee in 1918."
----- "Argumentation in Foreign Policy Settings: Britain in 1918, Munich in 1938, and Japan in 1970."
Jeffrey Hart, "Comparative Cognition: Politics of International Control of the Oceans."
----- "Cognitive Maps of Three Latin American Policy Makers."
Stuart A. Ross, "Complexity and the Presidency: Gouverneur Morris in the Constitutional Convention."
Fred S. Roberts, "Strategy for the Energy Crisis: The Case of Commuter Transportation Policy."
G.M. Bonham and M. Shapiro, "Explanation of the Unexpected: The Syrian Intervention in Jordan in 1970."
----- "Foreign Policy Decision-Making in Finland and Austria: The Application of a Cognitive Process Model."
Matthew G. Bonham *et al.*, "The October War: Changes in Cognitive Orientation Toward the Middle East Conflict."
----- "A Cognitive Process Model of Foreign-Policy Decision-Making."

data sources. The structural model of analysis requires a high degree of unobtrusiveness and therefore uses mainly verbatim transcripts, detailed notes, speeches, or book excerpts. The functional model, with its emphasis on process, requires replicability and therefore tends to prefer open-ended interviews with policy officials.

The three groups will be discussed separately, beginning with the structural approach:

The aim of the cognitive structure analysts is to determine the sources, watersheds, tributaries, streams and confluences of causal paths and arguments. They then try to ascertain whether the conclusions drawn or the policy choices made are consistent with the cognitive maps of the policy makers. The criteria used to evaluate cognitive structure are the presence or absence of feedback loops or cycles, the balance or imbalance of causal paths, and density, i.e. the ratio of causal links to the total number of concepts used, which measures the degree of causal interconnection present in the map.

The following propositions were examined: decision makers simplify their cognition by satisficing, by selective attention to one goal at a time, or by using lexicographic decision rules in evaluating policies against goals (Axelrod, 1972b: 92). A correlation exists between political responsibility and the number of goal or other variables used, and the ratios between them, as well as between political

responsibility and map density (Hart, 1977: 137). Developed nations will have denser goal structures than developing nations (disconfirmed). Positions taken by the actors will be consistent with their goal structures. Actors with similar positions will have similar beliefs (Hart, 1976: 184-185).

The studies use differing sets of concept variables, such as utility, goal, policy, and peripheral variables.

Additional descriptive measurements used are: the relative frequency of the different types of variables, concept centrality, matrix distances between two actors relative to distance on positions taken towards certain goal variables, length of the chains of argument in a cognitive map, and value/utility assertions as an indicator of interest. Axelrod (1977) also tested a model of a defense/attack style of argument, and Hart (1976) analyzed the goal structures of a number of collective entities such as nations, or the international oil industry. His maps were estimated by a group of judges.

The cognitive structure analysts obtained the following results: cognitive maps tend to be acyclical. Very often they are also to a great extent path-balanced. This suggests that the variables which promote utility are simply maximized while all others are minimized. In this way, the decision maker avoids trade-offs and feedback problems. In the one case where a large path imbalance existed, short chains of

argument were consistently used. This may constitute a simplification device which would allow the decision maker to keep only short paths in mind. Policies tend to be consistent with the cognitive maps. There is a high degree of deductive consistency, and no deductive errors were reported.

The study by Roberts (1976) is an attempt at constructing a map to model cognition of commuter transportation and energy factors. Experts were used to select representative variables and to determine the value of their linkages. System stability and type of growth exhibited were tested by manipulating the signs of the causal links.

The last group of studies examined represents the work done on cognitive process analysis by Bonham and Shapiro. Unlike the structural analysts, the process analysts are interested in computer simulation of the receiving and processing of information and in examining the changes taking place over time in the policy maker's belief structure. Their model uses four types of concept variables (affective, cognitive, policy, and value concepts) and five operational processes (initial amplification, search for antecedents, search for consequences, search for policy alternatives, and policy choice) (Bonham and Shapiro, 1971: 115).

Bonham and Shapiro (1979: 19) attempt to solve the problem of indeterminate total path effects by retaining the path having the greater cognitive centrality. They

measure cognitive complexity by counting the number of deductive paths used to explain an event or a response, or by calculating an integration or a discrimination coefficient (Bonham and Shapiro, 1973, 1977a).

Assumptions and propositions examined are: people will try to preserve the beliefs which are relatively central to their entire belief structure; they will cut cognitive costs by modifying the peripheral beliefs. People will try to achieve cognitive consistency by "differentiation" or by "transcendence" (Bonham *et al.*, 1979: 11). In the absence of firm beliefs about events, decision makers tend to rely on previous experience. Conceptual complexity is positively related to the range of behaviors (Shapiro and Bonham, 1973: 150).

The cognitive process analysts obtained the following results: the structural properties of cognitive maps, even concepts and their links, are quite stable over time. Cognitive maps obtained from one context are useful in another context. People tend to fit new information into preexisting structures without making a general adjustment. The computer simulation model (1977a) generated plausible explanations and policy preferences.

2.6 Claims Made for Cognitive Mapping

The utility claimed for cognitive mapping in the literature reviewed can be divided into three broad categories.

These are (1) assisting the decision maker in improving decision-making technique, (2) influencing decision makers, and (3) advancing international relations theory. Below, a detailed listing of the individual claims is provided as a reference for a later discussion and assessment of the cognitive mapping approach:

(1) Assisting the decision maker in improving decision-making technique:

By designing a formal system of analysis based on cognitive mapping, facilitate certain types of policy choice evaluations, expand the range and complexity of policy choices that a reasonably skilled person could handle, and promote the development of new ways of thinking (Axelrod, 1976: 4-5).

Assist the decision maker in making correct inferences from a set of beliefs that has a complex structure (Axelrod, 1976: 57).

Solve strategic problems by determining how causal links should be changed to achieve better outcomes. Systematically generate potentially useful strategies (Roberts, 1976: 173-177).

Permit the policy maker to relate event(s) to policy alternatives and policy objectives (Shapiro and Bonham, 1973: 163).

As ultimate goal, provide machine-aided policy recommendations that are congruent with the way real decision makers use concepts and justify choices (Bonham and Shapiro, 1974: 141).

(2) Influencing decision makers:

Advise decision makers in terms of their own cognitive maps, based on their own experience and their own concepts (Axelrod, 1976: 17).

Increase effectiveness of argumentation through knowledge of its strategic structure (Axelrod, 1977: 744).

If actors differ because their cognitions differ, then agreement can be reached by altering cognition (Hart, 1976: 184).

(3) Advancing international relations theory:

Cognitive mapping provides a systematic, reliable way to measure and analyze the structure of an argument, and not just its separate parts. Moreover, it provides the capacity to represent and make inferences from both causal assertions and statements of value, the very foundations of analytic decision-making (Axelrod, 1976: 287).

Cognitive mapping is explicitly based on a theoretical approach to cognitive processing (Bonham *et al.*, 1979: 13).

In decision-making analysis where the constitution of the situation must be included, cognitive mapping is a useful alternative (Bonham *et al.*, 1979: 10).

The cognitive process approach is more empirically based than the rational choice approach. It avoids the limitation of the rational choice approach with respect to the problem of what information is (Bonham *et al.*, 1979: 10).

Because policies tend to be consistent with cognitive maps, the maps may have some explanatory (and perhaps even predictive) capability (Hart, 1977: 137).

3. METHOD

3.1 Choice and Purpose of the Test Study

The reason for selecting the Munich conversations for this study is the rare opportunity they afford to get a good clear look at a personal diplomacy confrontation between the leaders of two powerful nations playing for high and very real stakes in a setting of complete confidentiality.

But this choice at the same time removes the analysis from the ambit of Axelrod's "evaluation theory of decision-making," because the high-level bargaining setting precludes the type of bureaucratic weighing of policy options for which his application was designed.

The task of the present study will therefore be to incorporate as much of the existing methodological stock as possible, but to move beyond the examination of the structure of policy substance to the investigation of nomothetic attributes of cognitive form and process. The hope is that since it is possible for a military analyst to glean strategic information about enemy intentions from the study of troop and weapon systems deployment, a cognitive mapping analyst should be able to draw conclusions about the dispositions and intentions of a policy maker from his deployment of belief types or from the composition and placement of the causal logistic chains that supply his main arguments.

In terms of the uses identified for cognitive mapping

in the literature survey, the present study thus falls somewhere between advancing international relations theory and assisting the decision maker by providing some insight into the thinking of an opponent.

The documentary nature of the source material also dictates an analysis for cognitive structure rather than for cognitive process. However, this is supported by the recognition that

"the real power of this approach appears when a cognitive map is pictured in graph form; it is then relatively easy to see how each of the concepts and causal relationships relate to each other, and to see the overall structure of the whole set of portrayed assertions." (Axelrod, 1976: 5)

It was felt that any attempt to probe and assess the broadest range of the analytical possibilities offered by cognitive mapping would have to be based on its basic form of graphic representation.

The text used for coding is the English translation of the memoranda on the conversations between Adolf Hitler and Neville Chamberlain. They were prepared in minute form by Paul Otto Schmidt, Hitler's personal interpreter and the only other person present at the first meeting between the two men. At the second and third meeting, he was joined by Ivone Kirkpatrick, the First Secretary of the British embassy, who had been drafted to act as the British interpreter and recorder because of his excellent knowledge of German. Kirkpatrick was asked to attend because Chamberlain had been forced to

sit down and prepare his own notes from memory in the evening of the first day, after Ribbentrop, the German Foreign Minister, in one of his piques had ordered Schmidt to provide his record of the conversations only to Hitler (Taylor, 1979: 744).

The Schmidt and Kirkpatrick versions appear to be substantially in agreement, however, with the exception of a point later on in the third meeting, when Schmidt had to provide a sight translation of the German memorandum. Taylor notes:

"At this point, the Schmidt and Kirkpatrick records differ in the order and content of the discourse. The Kirkpatrick version is fuller and probably more accurate chronologically, as Schmidt was doing the oral translation, which must have limited his time and attention for record keeping."
(Taylor, 1979: 815)

Only the Schmidt version was used for coding, however, since it was felt that a fair test of the capability of cognitive mapping as an analytical tool should be carried out within the given constraints of the real world, where a document of this nature could rarely be cross-checked for accuracy and completeness.

3.2 Conventional Summary of the Coded Text

The documentary material coded for this study consists of the record of three meetings between Adolf Hitler and Neville Chamberlain in September 1938 (Documents on German Foreign Policy, 1949: 786-798, 870-879, 898-908). It forms

the basis of what has since become known symbolically as "Munich," i.e. the subsequent four-power agreement signed on September 29 by which Britain and France surrendered their last chance of effectively stopping Hitler's plans of conquest (See Shirer, 1960: 421-427).

The source material is presented here in summary form for reference:

Berchtesgaden, Sept. 15, 1938 - The talks opened with mutual expressions of hope for closer Anglo-German relations. Chamberlain praised Hitler's success in bringing Germany back to prosperity and Hitler spoke of his long-held idea of a racial affinity between the two nations. The key to the future of Anglo-German relations, he said, was the Sudeten German question, which was now moving toward an open crisis. The situation was very grave: the populations of entire villages had fled Czechoslovakia and hundreds of Sudeten Germans were dead or injured.

Hitler's mandate derived from the confidence which the German people placed in him. He had to act, and he was bound by his promise to free them from the sufferings caused by the Treaty of Versailles. But his objective was limited: the racial basis of the National Socialist Party excluded any form of imperialism. He was not insatiable: witness the understanding with Poland, the Anglo-German Naval Agreement (which, however, it would be more honest to denounce if Britain continued to threaten intervention against Germany),

the treaty guarantees given to the Netherlands and to Belgium, and the declaration to France that there were no outstanding territorial claims.

But there was one very clear demand: the return to the Reich of the three million Germans in Czechoslovakia. To achieve this, Hitler would face any war, and even the risk of a world war.

Asked whether the return of the three million Sudeten Germans was all Germany was demanding, or whether she was aiming at the dismemberment of the Czechoslovak State, Hitler replied that the other minorities would no doubt make similar demands and that he was determined to solve the Sudeten German problem by one means or another.

After pointing out that Britain had made no threats but had only given a warning, Chamberlain further explored the German attitude towards what would be left of Czechoslovakia once the Sudeten Germans were restored to Germany, and how this return was to be accomplished in practice.

Hitler said that the Sudeten German region had to be viewed as a whole and that minorities could be exchanged later. But this was all quite theoretical and he was firmly resolved to act quickly. He flatly rejected a joint appeal to both sides in Czechoslovakia and instead pressed Chamberlain for an announcement that Britain agreed to a cession of territory based on the right of national self-determination.

Chamberlain replied that he personally recognized the

principle of detachment of Sudeten areas but would wish to seek the approval of the British cabinet. He was also concerned about a deterioration of the situation.

Godesberg, Sept. 22, 1938 - Chamberlain began by declaring the agreement in principle of both the British and the French government and of Czechoslovakia. He then presented a proposal under which districts where the German population was 80 percent or more would be transferred without a plebiscite, with a commission to be set up to decide on areas that were less densely German, down to perhaps 65 percent. There also were the questions of property conveyance, valuation of Czech state property, and the assumption of a proportion of the Czech national debt by Germany. And to compensate for the loss of the Czech mountain fortifications and to ease acceptance of the proposal, Czechoslovakia's existing treaty alliances could be replaced by an international guarantee of security against unprovoked aggression.

Hitler thanked Chamberlain for his efforts but regretted that he could not accept this plan. The problem was not an injustice done to Czechoslovakia but rather to the German and other minorities, upon whom an artificially created state had been imposed against their will. There could be no peace in Central Europe until the claim of all these nationalities had been settled. The situation was urgent and intolerable, the Czech government was in a dangerous turmoil, tensions in the frontier areas were untenable; not an hour could be wasted.

There was only one possible solution and that was to immediately redraw the frontier along ethnic lines and to occupy the zone thus created with German troops and administrative agencies. This must be followed by a plebiscite in the whole area, based on 1918 population figures. Supervision by an international control commission would be acceptable. The basis for the territorial readjustment would be simple majorities of population, to be applied on broad lines. Hitler rejected all compensation for Czech state property on the grounds that the contribution of German industry and intelligence had far exceeded their numbers in the population.

He also rejected a proposed nonaggression pact between Germany and Czechoslovakia because it would only provoke mistreatment of the other minorities with impunity.

Godesberg, Sept. 23, 1938 - Hitler presented a memorandum containing the German proposals, saying that he still hoped for a peaceful solution. The friendly spirit in which Britain was seeking a solution to the crisis could be a turning point in Anglo-German relations. Chamberlain agreed, but he noted that Germany was not prepared to discuss implementation of the principles agreed upon. She was now hastily moving toward a solution by force that would entail frightful losses of human life. The ultimatum set in the German memorandum would make a clash unavoidable.

When a message was brought in announcing Czech general mobilization, Hitler was in no doubt that now Czechoslovakia would never dream of ceding territory and that he would be forced to take appropriate countermeasures.

There followed an exchange about which side had mobilized first, and Chamberlain again stressed the terrible cost in destruction and devastation of a solution by force and asked whether the memorandum was really Hitler's last word. Assured that it was, he agreed to submit it to Czechoslovakia on the assumption that there would be no German invasion, but he warned that its ultimatum-like form would have a very bad effect on public opinion.

Hitler replied that the period of tension and dangerous uncertainty must be kept as short as possible but that he was prepared to limit the detailed timetable to one final date: October 1st.

Chamberlain pointed out that he was a mediator and could do no more than transmit the proposal. He again referred to the previously presented two-stage occupation plan, but Hitler said that for purely technical reasons this was not feasible and that in the areas not uniformly German a visible authority was needed to establish peace and order. Nor would he again impose on the German population the presence of international troops. He concluded by declaring that the Czech problem was the last territorial demand which he had to make in Europe. Germany would of course continue to bring up the

question of colonies, but this was not a warlike demand.

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Between the meeting held on September 22nd and its resumption in the evening of the 23rd, the two leaders exchanged a series of three letters (Chamberlain, 1939: 166-171). These were not coded but are included here because they form part of the continuity of the conversations.

Chamberlain sent a note to Hitler to "clarify the situation and accelerate our conversation." He declared himself ready to submit the German proposal to the Czech government but felt that there was no need for a plebiscite in the majority of the areas involved. The difficulty he saw was with the proposed immediate occupation by German troops, which he was sure would be condemned by the world as an unnecessary display of force. He proposed that pending a final settlement, the Sudeten Germans themselves could be made responsible for maintaining law and order. Hitler replied by repeating the history of the German claims and concluded by saying that recent events had shown that the Sudeten Germans needed protection. The Czechs were merely stalling for time. If the transfer was not possible through negotiation, Germany was prepared to "exhaust the other possibilities which then alone remained open to her." Chamberlain thereupon asked Hitler for a memorandum on the German proposal and expressed his hope that there would be no action by Reich forces that would prejudice further mediation.

3.3 Coding

Coding of the text was carried out using the Documentary Coding Method described by Margaret Wrightson (1976). According to this procedure, a text is analyzed for causal assertions by locating all concepts that are linked by a causal belief or cause-and-effect relationship. The concepts must be variables and may be continuous, ordinal or dichotomous in nature. However, their variability must be evident because it determines the sign of the linkage between cause concepts and effect concepts.

To illustrate: the cause concept *Czechoslovakia losing her fortifications in the mountain districts* (dichotomous because the fortifications are either lost or retained here) is related negatively to the effect concept *Security of Czechoslovakia* (continuous because its change is one of degree). Losing the fortifications diminished Czech security. Retaining them would augment it and therefore constitute a positive relationship. What is important to note, however, is that 'positive' and 'negative' are not value judgements; the signs merely indicate the direction of the change transmitted via the causal linkage.

Where the relationship is found to be more differentiated than a simple plus or minus, the coding rules provide for five additional linkage signs:

- will not hurt, does not prevent, is not harmful to.

0 will not help, does not promote, is of no benefit to.
a may or may not be related to, affects indeterminately.
m affects in some non-zero way.
O does not matter for, has no effect on, has no relation to.

In order to capture value relationships to actors (persons, organizations, countries) which are part of the policy environment, a special utility concept is employed which represents an actor's unspecified best interests (Axelrod, 1976: 59).

Because people frequently express their belief about what is or is not in someone's best interests in an indirect manner, by using a biased expression or a loaded term, locating all the utility assertions in a text requires a great deal of discernment and alertness on the part of the coder. For instance, the assertion that the "Germans are now *hastily and precipitately* making for a solution by force" is clearly held to be not in Germany's best interests by the speaker and should therefore be coded as a negative effect on German utility, even though this belief was not expressly spelled out.

The work of analyzing a text for the purpose of extracting its causal assertions involves a dual approach: examining the grammatical structure for subject/verb/object relationships and probing the substance for implied or inherent content relationships. The latter method may at times extend to cover a whole sentence group. In such cases, it will be necessary to use paraphrasing, but as a general rule, the

concepts are listed fully by retaining the original formulation as faithfully as possible, including adjectival or adverbial clauses. This precaution helps to prevent errors in the subsequent merging of identical or nearly identical concept variables.

The coding of the text was carried out in two stages. First, all the causal assertions identified in Hitler's statements were marked and listed individually. Separate coding sheets, identified by page numbers and letter symbols, were used for each concept-to-concept linkage. Next, all of Chamberlain's causal assertions were coded in the same way. Those concept variables which were recognized as being obviously identical were assigned the same page/letter symbol.

Despite the fact that the coding rules had been thoroughly learned beforehand and had been reinforced during practice coding, some improvement in coding skill and a surer grasp of certain coding principles were noted toward the end of the coding operation. Because of this, it was decided to do a complete concept-by-concept review of the coding. Although this was a time-consuming task, it was considered necessary to achieve the desired uniformity of coding and to make sure that none of the utility relationships had been overlooked.

The coding operation covered 30 pages of text and yielded a total of 300 causal assertions, or about one for every 44 words of coded text. This ratio is similar to the one found by Axelrod (1972b: 87).

3.4 Reliability

A fair test of the cognitive mapping approach depends to a large extent on intercoder reliability. This is why a considerable effort was made to ensure a faithful and consistent application of the coding rules.

No formal reliability test was carried out. Instead, utmost care was taken in learning and applying the comprehensive coding manual prepared by Wrightson. It represents a refinement of the original coding rules developed by Axelrod and of the more extensive coding instructions written under his supervision by Jeffrey Hart.

These coding rules were found to "have reached a state of precision such that intercoder reliability is fully compatible with the accepted standards of good quantitative work in the social sciences" (Axelrod, 1972b: 84).

This holds true for the number of codable assertions identified and for specification of the cause variables, the effect variables and the sign of their linkages. It also applies to agreement on merging, which is the decision by the coder that two or more different formulations in the text represent the same concept variable (Axelrod, 1972b: 85-86).

To ensure the faithful and consistent application of the Wrightson coding manual in this study, several practice texts were coded before work on the Hitler/Chamberlain conversations was begun. Following a complete first coding of the minutes of the three meeting days, the entire text was reviewed to

ensure consistent coding and to pick up any utility linkages that were missed at first because of the initially too narrow interpretation of the coding rules.

3.5 Treatment of Raw Coded Data and Map Construction

Once all causal assertions have been coded, a further step is necessary before they can be transformed into a cognitive map. The coded concept variables must be examined for essential differences and similarities, and all variables representing the same logically distinct concept, whatever their formulation, must be merged into a single concept variable. This is crucial for assuring that the resulting cognitive map is not just a juxtaposition of fragmented cognition elements but represents interconnected cognitive structures.

The manual encourages the coder to be conservative, however, and advises that, "all concepts should be treated as separate and distinct until it is demonstrated that they are the same." (Wrightson, 1976: 323).

It turned out that here was a lesson which was learned the hard way in the course of preparing Hitler's cognitive map. It was felt that the need to satisfy the demands of intercoder reliability did indeed impose a very conservative approach to merging, and a trial map was therefore constructed after what seemed to be an appropriate amount of merging of obviously alike concept variables.

The resulting map did show the major nodal points, true, but it also contained a bewildering profusion of unconnected short paths, which offered scant promise of a rich analytic lode.

One reason for the unmanageable number of concepts is of course the decision not to limit coding to the main issues or arguments but to code the text in full. This was done in order to capture all the causal associations made by the speakers and to obtain a more complete picture of any emerging thought patterns.

A second reason is the significantly greater number of concepts generated by Hitler (1 for every 33 words) compared to Chamberlain (1 for every 40 words).

The merging rules set out several criteria by which the appropriateness of a merging decision may be judged. For instance, the generality of the text might indicate the permissible generality of the individual concept variables. Predominant concepts must be retained and less frequently mentioned ones may be subsumed into them. Mergers must not distort the speaker's logic nor should they involve variables that have express relationships between them (Wrightson, 1976: 323-324).

Within the scope of these merging criteria a second and coarser aggregation of the concept variables was achieved by clustering a larger number of similar variables into the predominant central concepts.

In Hitler's map, for instance, the concept *Intolerable situation in Czechoslovakia* represents a combination of 18 different codings of this variable. It includes all manner of variations on the theme "intolerable" as well as more specific descriptions of the situation that fit Hitler's conception of "intolerable."

The concept *Peaceful solution of the Sudeten German question* combines 10 different codings in all and includes *Achieving inclusion of Sudeten Germans in the Reich by peaceful means*, *Success in striving for a solution of the one remaining question at issue, in a spirit friendly to Germany*, and *Success in finding a peaceful solution together*.

Care was taken to ensure that the more general concept formulation did not alter or distort the nature of the originally coded, more specific causal relationship.

In addition to the further reduction achieved through more extensive merging, a number of the causal assertions coded were eliminated during the course of map construction. These were assertions that could not be linked up to any of the causal chains; assertions that were duplicated during the merging process; assertions about side issues or subsidiary aspects, like the Anglo-German naval agreement or the disposition of Czech state property; as well as a small number that were too vague to be of significance.

The procedure used was the same for both maps, except that Chamberlain's assertions did not allow the same

large-scale clustering of variables into central concepts. In the end, the cognitive maps contained an about equal number of concepts for Hitler (80) and for Chamberlain (82). This matched size, although not deliberately planned, was nevertheless welcomed because it makes the comparative analysis of the two maps more meaningful.

A comparison of the ratio of causal assertions to the number of words of text coded provides a further indication of the effect of merging and elimination on the final cognitive maps:

	<u>Hitler</u>	<u>Chamberlain</u>
Raw coding:	1:40	1:50
Final plotting:	1:62	1:62

A useful convention employed in the construction of cognitive maps by Bonham and Shapiro (1971: 115), consists in classifying the coded concepts into four different types.

These are:

- A-Concepts - *affective concepts* or immediate policy objectives of a decision maker.
- C-Concepts - *cognitive concepts* or beliefs of a decision maker about events that occur in the international system.
- P-Concepts - *policy concepts* or possible alternatives or options from which a decision maker selects policy recommendations.
- V-Concepts - *value concepts* or abstract values, such as national security, that a decision maker tries to satisfy.

To accommodate value assertions, Axelrod provides for Utility Concepts - *effect assertions* about an actor's unspecified best interests.

The terms used for this classification are taken from attitudinal research, which distinguishes between cognitive, affective, and conative dimensions of mental activity. "Value" concepts are added to accommodate composite predispositions, or broad operating principles.

To avoid any confusion between the different terminological conventions used in social psychology and the definitions adopted by Bonham and Shapiro, the concept types used in this study are redefined operationally below:

Value concepts are abstract values or general principles. They are the basic tenets which serve as motivation of the whole range of behaviors. Example: *Hitler's racial ideas.*

Affective concepts represent the evaluative dimension. They combine choice preference with intensity of commitment and thus reflect intention and priority. A-concepts embody the executive function compared to the legislative function of the V-concepts. Example: *Seeking a quick solution, one way or another.*

Policy concepts may be regarded as second or third string A-concepts. They are conative or behavioral options which carry a lower degree of intellectual and emotional commitment. Example: *Carrying out a plebiscite.*

Cognitive Concepts are perceptions or beliefs about events. They represent the policy environment and their substance is informational. Example: *Germans deciding on a solution by force.*

Utility concepts are variables representing value assertions which refer to concrete actors rather than to the abstract principles represented by V-concepts. Example: *Czechoslovakia ... a long-standing wrong for Germany.*

A look at these definitions quickly reveals that they are not exclusive. They are arranged on a continuum where cognition (C) gives rise to conation (P), is intensified by emotion (A) and then generalized into a precept (V).

The map layout adopted follows the integrative hierarchy of the concept types. The general principles (V) are placed on the far left, followed to the right by high-priority objectives (A), policy alternatives (P), their interaction with the perceived environment (C), and their impact on the interests (Utilities) which presumably gave rise to the general principles.

The purpose of breaking the coded concepts down into categories is to make the analysis more sensitive to differences in intellectual processes that might not otherwise emerge. The typology also ensures a more structured arrangement of the map elements and consequently an easier visual analysis.

Once it was decided to adopt this concept typology for

the study, it became necessary to recode and renumber all the concepts. This was done in conjunction with the construction of the preliminary or trial maps, which now involved the following steps:

- a) Identification of the central concepts.
- b) Assembly of interconnected causal chains.
- c) Clear and concise rephrasing of the concepts.
- d) Assignment of a new letter/number symbol.
- e) Plotting of concepts and linkages on map.

It will be noted that a number of the concept variables carry negative signs. This means that they represent the opposite of the positively signed variable. Mathematically, such variables are handled by multiplying their sign by the sign of their linkage to determine the value of their effect. For instance:

-C2 $\pm$ A1	Prospects of a peaceful solution <u>not</u> destroyed
	is positively related to
-	Finding a peaceful and just solution
C2 $\pm$ A1	Prospects of a peaceful solution destroyed
	is negatively related to
	Finding a peaceful and just solution

The final cognitive maps for both subjects were drawn by arranging the concepts and their linkages in visually optimal groupings in such a way that the need for crossed linkage arrows was kept to a minimum.

Fig. 4: Cognitive map of Adolf Hitler.

Key to Figure 4 - Hitler's Concept Variables

- V1 The German people's confidence in Hitler
- V2 Hitler's obligation to protect the interests of the German nation
- V3 Hitler's significance to the German people
- V4 Hitler not a free agent
- V5 Hitler the German nation's spokesman and representative
- V6 Germans expect Hitler to speak plainly
- V7 Germans expect Hitler to act energetically
- V8 German suffering caused by the Treaty of Versailles
- V9 Hitler's promises to the German people
- V10 Hitler's racial ideas
- V11 Imperialism in any form
- V12 Hitler's age advancing
- V13 Right of self-determination established in 1918

- A1 Peaceful solution of Sudeten German question
- A2 Seeking a quick solution, one way or another
- A3 Hitler failing to speak plainly
- A4 Hitler failing to act energetically
- A5 Hitler's first thought for Germans given up
- A6 Sudeten German question a turning point in Anglo-German relations
- A7 Return of 3 million Germans in Czechoslovakia
- A8 Demand for release of all Germans from Czech military and police forces
- A9 Hitler will not yield one single step

- P1 Holding a plebiscite in the Sudeten region
- P2 German people prefer a "strategic frontier"
- P3 Czechoslovakia a proving ground for methods and procedures
- P4 German military countermeasures
- P5 German military machine put in motion
- P6 Relocating frontier to follow language distribution
- P7 Occupation by German administration

P8 Occupation by German troops
P9 Establishing clear-cut facts
P10 Time limits set in the German memorandum
P11 Anglo German rapprochement
P12 Germany unable to keep divisions under arms waiting indefinitely
P13 Germany's friendly relations with Poland and Hungary
P14 Conclusion of a non-aggression pact with Czechoslovakia
P15 Germany not calling up any Czechs for military service
P16 No wish to force Czechs to fight Czechs
P17 Withdrawal of Czech state police
P18 Visible authority in areas less uniformly German
P19 Germans yet again under international occupation
P20 Hitler fully prepared to hand back Czech majority areas
P21 Frontier adjustment naturally on broad lines

C1 Intolerable situation in Czechoslovakia
C2 Czechs shooting Sudeten Germans
C3 Increase in emotional tension
C4 Probability of incidents in Sudeten German area
C5 Danger of conflict with Czechoslovakia
C6 Increase of hatred
C7 Lessening of tension
C8 Czechoslovakian question of prime emotional importance
C9 Czech mobilization
C10 Chamberlain's efforts
C11 Surrender of many Germans to other states
C12 Czechs no longer prepared to cede territory
C13 Stopping the course of events
C14 Help from German side of the frontier
C15 A regular border war
C16 Czechs challenging accuracy of ethnic frontier envisaged
C17 France ready to go to war with Germany
C18 Probability of Czech obstruction
C19 Danger of a world war resulting
C20 Certain consequences in other countries

- C21 A state of international tension which must be ended as quickly as possible
- C22 Difficulties in negotiations
- C23 Anglo-German relations in recent years
- C24 All problems of Czechoslovakia with her neighbors settled
- C25 No more fear of attack by Germany
- C26 Czechs dropping all future consideration for Polish and Hungarian minorities
- C27 Czechs no longer restrained by Britain and France
- C28 Anti-German demonstrations
- C29 Moral basis for changes made under Treaty of Versailles
- C30 Immediate pacification of the Sudeten region
- C31 Germans regard Czechs as cruel and cowardly
- C32 Czechoslovakian alliances with other countries
- C33 Remaining Czechoslovakia still a menace to Germany
- C34 Germans wanting to remain in the Czech state
- C35 Good riddance to Germans wanting to remain in Czechoslovakia

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Fig. 5: Cognitive map of Neville Chamberlain.

Key to Figure 5 - Chamberlain's Concept Variables

- V1 Security of Czechoslovakia
- V2 Self-determination

- A1 Finding a peaceful and just solution
- A2 Improving Anglo-German relations
- A3 Chamberlain acting as mediator
- A4 Initiating a direct exchange of views with Hitler
- A5 A natural British tendency toward friendship with Germany

- P1 Trying to satisfy Hitler's demands
- P2 Obtaining agreement in principle to the cession of territory
- P3 French acceptance of the principle of cession of territory
- P4 Czech acceptance of the principle of cession of territory
- P5 Chamberlain's recognition of the principle of detachment of the Sudeten areas
- P6 No point in continuing the conversations
- P7 A guarantee of security against unprovoked aggression against Czechoslovakia
- P8 Solution involving altering frontiers or ceding territory
- P9 Sweetening the proposal for Czechoslovakia
- P10 Carrying out a plebiscite
- P11 Valuation of Czechoslovak state property
- P12 Presently determined Czech frontiers fixed in perpetuity
- P13 Czechoslovakia to be completely neutral
- P14 Czechoslovakia in future able to use her forces only for self-defense
- P15 Recognizing the principle of self-determination in all circumstances
- P16 Recognizing the principle of self-determination in all countries
- P17 No time to lose
- P18 Population transfer
- P19 Addressing a joint appeal to both parties in Czechoslovakia
- P20 Need to set up a commission
- P21 Hitler accepting immediate occupancy of a 'preponderantly German' zone

- P22 Holding a plebiscite only where the majority situation is doubtful
- P23 British friendship with Germany
- P24 Plebiscite to be free from military or other pressure
- C1 The outcome of a conflict very uncertain
- C2 Prospects of a peaceful solution destroyed
- C3 Chamberlain disappointed
- C4 Quite considerable losses
- C5 Hitler's non-acceptance of proposed cession of territory
- C6 British public opinion becoming more unfavorable
- C7 Hitler having got what he demanded from Chamberlain
- C8 Chamberlain does not understand non-acceptance of his proposals
- C9 Germany prepared to discuss application of the principle of cession of territory
- C10 Chamberlain risked his political career
- C11 Chamberlain accused of having sold out Czechoslovakia
- C12 Chamberlain overcoming difficulties
- C13 Germans deciding on a solution by force
- C14 Frightful losses of human lives
- C15 Destruction and devastation
- C16 Great hardships for those involved
- C17 Chamberlain's conscience clear
- C18 Chamberlain having done everything humanly possible
- C19 Czechoslovakia losing her fortifications in the mountain districts
- C20 Presenting the least difficulty
- C21 Both sides to be clear about methods of Sudeten area detachment
- C22 Czechoslovakia demanding a substitute for lost security
- C23 Considerable difficulties arising in other parts of Europe
- C24 Incidents and disorder taking place in the meantime
- C25 A long delay
- C26 Deplorable effect on public opinion abroad of the form of the German memorandum
- C27 Ultimatum-like form of the German memorandum
- C28 Deplorable effect on British public opinion of the form of the German memorandum
- C29 German memorandum couched in the language of a conqueror

- C30 The Czech government publishing the German memorandum
 - C31 The German memorandum leaving no time for discussion on measures for the peaceful execution of existing plans
 - C32 Czechoslovakia accepting the German memorandum
 - C33 Tense situation in Europe
 - C34 Both parties precisely informed about each other's views
 - C35 Danger of conflict extremely close
 - C36 Chamberlain being applauded at the time of his first trip to Germany
 - C37 Chamberlain's confidence in an Anglo-German rapprochement redoubled
 - C38 Minority problem
 - C39 Germans remaining in the rest of Czechoslovakia
 - C40 Questions regarding property and its conveyance
 - C41 Czech inhabited enclaves
 - C42 Hitler's strong feeling for the sufferings of his people
 - C43 Extraordinary success of rebirth of the German nation
 - C44 Need for greater care in frontier establishment
 - C45 Advantages accruing to Britain from friendship with Germany
 - C46 Sudeten German question a matter between Germans and Czechs
 - C47 Chamberlain booed on leaving for second trip to Germany
- - - - -

4. RESULTS

In order to make sure that all patterns and characteristics inherent in the two cognitive maps presented in Figs. 4 and 5 are able to emerge in the analysis, it was decided to use a multiple approach to examine their structure. The methods used were:

- enumerative analysis
- utility analysis
- central concept analysis
- causal path analysis
- cybernetic analysis

4.1 Enumerative Analysis

Table 1 contains a quantitative description of the data base and shows some general relationships between the basic elements of the two cognitive maps.

TABLE 1: Source text and cognitive elements.

	(1) No. of raw concepts	(2) No. of concepts plotted n	(3) No. of words of text x	(4) No. of causal links m	(5) Concept frequency n/x	(6) Density $\frac{m}{n(n-1)}$
Hitler	214	80	7100	114	.011	.018
Chamberlain	151	82	6050	97	.014	.015

The fact that it was possible to reduce the number of Hitler's raw concepts from 214 down to 80 concepts plotted - a reduction of 63% compared to 46% for Chamberlain - points to a greater amount of redundancy in Hitler's cognition.

The *density* of a cognitive map represents the number of causal linkages perceived, expressed as a proportion of the total number of theoretically possible linkages (Hart, 1976: 184). The density values of .018 and .015 obtained here appear to be low compared with other findings, and Hart (1977: 135) suggests that this may be attributable to the broader political responsibilities of the subjects analyzed.

TABLE 2: Distribution of concept types plotted.

	V-Concepts	A-Concepts	P-Concepts	C-Concepts	Utility Concepts
Hitler	13 (16%)	9 (11%)	21 (26%)	35 (44%)	2
Chamberlain	2 (2%)	5 (6%)	24 (29%)	47 (57%)	4

An obvious difference in the type of concepts used by the two men lies in Hitler's greater reference to V and A-concepts (values and immediate objectives) compared to Chamberlain's broader concern with C-concepts (events).

A similar difference emerges when the asserted linkage effects are examined. Hitler's references to effects on values and immediate objectives exceed Chamberlain's by 34:7. On the other hand, Chamberlain's mention of effects on policy

variables exceed Hitler's by 26:16. Overall, positive linkage valences outnumber negative valences by more than 3:1. Other valence values account for less than 4% of the total.

An examination of the effects produced by concept variables showed that the consequences flowing from positive A-concepts are almost always considered positive. The same is true for most of the P-concepts, although less so in the case of Hitler, who wanted to emphasize his constraints.

TABLE 3: Distribution of linkage valences and types of asserted effect.

		Linkage Valence					Total
		+	-	⊕	⊖	0	
V-Concept	Hitler	9	6	1	-	-	16
	Chamberlain	-	1	-	-	-	1
A-Concept	Hitler	11	7	-	-	-	18
	Chamberlain	5	1	-	-	-	6
P-Concept	Hitler	13	3	-	-	-	16
	Chamberlain	20	3	-	-	3	26
C-Concept	Hitler	37	6	2	-	-	45
	Chamberlain	45	1	-	1	1	48
Utility	Hitler	10	9	-	-	-	19
	Chamberlain	4	12	-	-	-	16
TOTAL		154	49	3	1	4	211

A comparison of the number of causal linkage assertions initially coded with the number plotted supports the earlier

assumption of a higher degree of redundancy in Hitler's cognition. In his case the reduction was from 178 to 114 (36%), and in Chamberlain's case from 122 down to 97 (20%).

4.2 Utility Analysis

The traditional method of rational choice calculation is to determine the comparative utility of the available policy options. In this study this was done by analyzing the impact of A-concepts on utility, and it was found that Hitler's immediate objectives were to take energetic action (A3, A4) to secure the return of three million Germans in Czechoslovakia (A7) and to obtain a quick solution, one way or another (A2), and that he had reservations about the development of Anglo-German relations (A6) and about the likelihood of a peaceful solution of the Sudeten German question (A1). Chamberlain only connected one A-concept to utility: finding a peaceful and just solution (A1).

A supplementary examination of Hitler's P-concepts showed that their impact on German utility is almost uniformly positive. The bargaining setting of the talks obviously did not favor a dispassionate weighing of pros and cons, a circumstance which, along with low cognitive centrality, would seem to disqualify the utility calculation for P-concepts as a reliable indicator of policy preference. Chamberlain's map again contains only one P-concept with a link to British utility (holding a plebiscite only in doubtful areas).

While this exercise of explaining policy choice by the utility linkages of A-concepts and P-concepts establishes the consistency of the cognitive maps with the actual choices made by the two leaders, it produces no surprises and adds no insight to what emerges from a reading of the minutes.

4.3 Central Concept Analysis

Hart (1976: 182) introduces the concept of a *goal structure*, which he defines as "the subgraph of an actor's cognitive map which consists of all of his goals and the causal relationships between them." It was felt that it would be useful to present the goal structures of the two subjects, since they would represent the essence of each man's position.

Fig. 6: Goal structure extracted from Hitler's cognitive map.

Fig. 7: Goal structure extracted from Chamberlain's cognitive map.

In extracting the goal structures, some liberty was taken with Hart's definition because not all the goals are included. Those without interconnection or links to a utility concept were omitted, and a check confirmed that they were indeed peripheral.

While one might agree that these two goal structures reflect the general aims of the actors, an examination of the full cognitive maps quickly revealed a disappointing absence of links between most of the principal goals and the causal chains in the maps.

In order to discover the prime forces of the arguments, a different method was needed, and it was found in the concept of *cognitive centrality*. The measure used for cognitive centrality is similar to the one used by Bonham and Shapiro (1971,

1979) and was taken from Harary *et al.* (1965: 16-18). It is the sum of the *outdegree* of a concept variable v , written $od(v)$, and its *indegree*, written $id(v)$, where $od(v)$ is the number of arrows from v and $id(v)$ the number of arrows to v . The *total degree* of v , $td(v)$, is the number of linkage arrows associated with the concept variable, or its centrality:

$$td(v) = id(v) + od(v).$$

To provide some indication of how active a part any specific concept plays in the decision maker's thinking, cognitive centrality values were calculated for individual concepts as well as for concept categories.

TABLE 4: Cognitive centrality of individual concept variables.

	<u>Cognitive Centrality Value</u>									
	15	9	7	6	5	4	3	2	1	
Hitler	1	2	2	2	3	8	11	21	28	
Chamberlain	-	-	1	2	5	3	14	25	28	

Concept category centrality is the mean of all the concepts in each category multiplied by their cognitive centrality.

It is interesting to note that Hitler's more frequent use of V-concepts and A-concepts is further reinforced by their relatively greater cognitive centrality, the measure of

interaction with other concepts.

A comparison of the concept category centrality values for both maps also shows a clear hierarchy in Hitler's use of the concept categories, while Chamberlain (except for a low value centrality) has no marked preference for a specific concept type.

TABLE 5: Mean concept category centrality.

	V-Concepts	A-Concepts	P-Concepts	C-Concepts
Hitler	2.6	4.0	1.9	2.8
Chamberlain	1.5	2.6	2.2	2.3

Figs. 8 and 9 show the highlighted *critical subgraphs* of all the concept variables with a cognitive centrality value of 4 or more, including their interconnections. Hitler's subgraph contains 18 central variables (23% of his concepts), and Chamberlain's subgraph contains 11 central variables (14% of his concepts). Only 4 of the central concepts are common to both subgraphs.

The highlighted connections are between V-, A-, and C-concepts. The P-concepts of both critical subgraphs are isolated: there are 5 in Chamberlain's and 2 in Hitler's, but only one of them (P4: *German military countermeasures*) has a causal linkage to the rest of the subgraph.

An impressionistic examination of the concept clusters

Fig. 8: Highlighted critical subgraph of Hitler's cognitive map.

Fig. 9: Highlighted critical subgraph of Chamberlain's cognitive map.

surrounding the central variables did not reveal any patterns or regularities.

4.4 Causal Path Analysis

In order to study the flow of cognition and to obtain information about cognitive patterns, the two complete maps were analyzed for causal paths. The criteria used for this analysis were drawn from the existing literature on cognitive mapping. They are:

- (a) Cognitive complexity
- (b) Causal path length
- (c) Deductive balance
- (d) Presence of cycles
- (e) Consistency of utility outcome with position taken
- (f) Evidence of psycho-logic
- (g) Reference to previous experience.

In the following, the results obtained for these criteria will be presented for each of the two cognitive maps separately.

Adolf Hitler

(a) Shapiro and Bonham (1973: 156) define cognitive complexity as the number of deductive paths that a decision maker may examine in explaining the significance of an event and selecting an appropriate response. This definition was adopted

here, and complexity is therefore calculated as the number of causal paths leading from a given variable to utility. The overall complexity was 2.3 paths, although a difference was found between the complexity of balanced graphs (2.0) and that of imbalanced graphs (3.7). Caution should be exercised in attributing much significance to this, however, in view of the nature of the imbalance discussed below.

(b) Causal path length is determined by tracing an effect on utility back to the farthest variable on a chain of unbroken linkages. The 54 paths identified in Hitler's map contained a mean of 3.4 causal assertions, with a range from 1-7.

(c) There are 9 imbalanced multiple path effects in this map, a number of them containing 5 and 6 different paths. Of these, 6 contain the concept C3: *Increase in emotional tension*. This is a composite coding of German outrage at the alleged situation in Czechoslovakia, whose coded effect on German utility is negative. The presence of this assertion produced indeterminate total effects for such concepts as *Return of the 3 million Germans in Czechoslovakia*, *German military countermeasures*, and *Seeking a quick solution, one way or another*. Worse still, if the convention of retaining as the decision maker's preference the path with the highest cognitive centrality is employed, two of these concepts even have a negative effect on German utility in Hitler's mind. Such a conclusion is obviously

inconsistent with his aims. But if "emotional tension" were to be interpreted as "righteous indignation," it would not have an adverse effect on the German population. A corresponding change of the linkage coding to nonnegative ($\oplus$) would then balance 6 of the 9 indeterminate total path effects.

The 3 remaining imbalanced subgraphs, i.e. *Right of self-determination*, *Peaceful solution of the Sudeten German question*, and *The Sudeten German question a turning point in Anglo-German relations*, are a reasonable reflection of Hitler's uncertainty about them.

(d) Hitler's map contains two cyclical subgraphs, shown in Figs. 10 and 11.

Fig. 10: A cyclical cognitive subgraph from Hitler's map.

The cycle represented in Fig. 10 might be read as follows: because of the emotional nature of the Czechoslovakian situation it becomes increasingly intolerable, thereby reducing the chances for a peaceful solution, which in turn

does not improve Anglo-German relations. This worsens the emotional impact of the Czechoslovakian situation.

Or the cycle might be read as follows: if the Czechoslovakian situation were made less intolerable, the chances for a peaceful solution would increase, with positive results for Anglo-German relations. This would give due recognition to the emotionally charged situation in Czechoslovakia but at the same time would make it more intolerable. Thus it seems that the cycle operating between C8 and C1 acts as a tension amplifier no matter what happens.

Fig. 11: A series of feedback loops or cycles.

Fig. 11 shows a subgraph with cycles within a cycle. It also features what seems to be an auxiliary emotional pitch generator designed to cut in should prospects of a quick solution tend to defuse the situation in Czechoslovakia and

produce less intolerable levels. A truly unbeatable device.

(e) With the qualified exception of the 6 indeterminate total effects discussed under (c) above, all of Hitler's utility outcomes are consistent with the available historical evidence of his positions.

(f) The imbalanced graph shown in Fig. 2 serves as an example of the type of psycho-logic employed in this map. Using the rule *ApB and BpC implies ApC* (Abelson and Rosenberg, 1958: 4-5), Hitler implies that self-determination caused German suffering (Documents on German Foreign Policy, 1949: 796) and should therefore certainly apply now that Germans were claiming it for themselves.

(g) Implicit reference to previous experience is made in concepts C13, C25, C26, C27, and C31, supporting Axelrod's contention that people use closest point estimation as a shortcut to prediction.

Neville Chamberlain

- (a) The cognitive complexity of his map is 1.3 paths per total effect on utility.
- (b) The 24 paths isolated averaged 1.9 causal assertions, with a range from 1-3.
- (c) All multiple path graphs are balanced.
- (d) The map contains no cycles.

- (e) Utility outcomes are consistent with Chamberlain's positions and objectives.
- (f) There is no clear evidence of the use of psycho-logic.
- (g) There is no clear reference to previous experience.

4.5 Cybernetic Analysis

Axelrod's answer to the question of what methods policy makers use to cope with the large quantities of causal interconnections is that they employ a simplified image of the policy environment that is structurally easy to operate with and then act rationally within the context of this simplified image (Axelrod, 1976: 244).

A somewhat different answer is offered by Steinbruner (1974: 68) who suggests that decision makers seek to reduce variety and control uncertainty. He writes

"The central focus of the analytic paradigm - finding an optimal solution under given constraints by direct calculation - is seriously under dispute. The cybernetic paradigm suggests rather that the central focus of the decision process is the business of eliminating the variety inherent in any significant decision problem." (Steinbruner, 1974: 56)

And he adds

"The mind resolves uncertainty by generalizing and by resorting to sources of belief strength independent of evidence from the empirical world."
(Steinbruner, 1974: 139)

In the analysis to follow, an attempt was made to find out how variety is reduced in the two cognitive maps under

study and what methods are used to control uncertainty.

Because *cognitive centrality* is considered to be an indicator of decision maker preference for a concept, it was decided to use this value to indicate selection for attention. An examination of the centrality values presented in Table 4 showed that while *td*'s between 1 and 3 were common, higher values occurred much less frequently. It was concluded from this that the concepts with a cognitive centrality of 4 and up represent the principal parameters selected by the two subjects in their efforts to achieve their objectives. The two critical subgraphs shown in Figs. 8 and 9 can therefore be considered as the second stage of variety reduction (the first stage being the complete omission of concepts from mention).

To find out whether cognitive variety was reduced still further, the critical concepts (*td* ≥ 4) were broken down by category, and the percentage of these concepts retained in each category was multiplied by the mean category centrality to obtain a weighted centrality value.

TABLE 6: Weighted concept category centrality of critical central concepts (*td* ≥ 4).

	V-Concepts	A-Concepts	P-Concepts	C-Concepts
Hitler	.60	2.24	.19	.64
Chamberlain	--	.52	.46	.25

Table 6 shows the overriding attention which Hitler pays to A-concepts (immediate policy objectives), an emphasis which - though less dramatically - holds true for Chamberlain as well.

Ultimately, therefore, variety - when expressed in terms of concept types or categories considered - is reduced to A-concepts with a cognitive centrality value of 4 or more.

The next step was to find out how uncertainty is controlled. Steinbruner (1974: 57-67) suggests that the decision-making process acts like a servomechanism which monitors a few critical feedback variables. "The cybernetic decision maker is sensitive to information only if it enters through an established highly focused feedback channel, and hence many factors which do in fact affect the outcomes have no effect in his decision process" (1974: 67).

For the purpose of this analysis it was assumed that these focused feedback channels are identical with the critical A-concepts. Frequency of causal association was equated with frequency of monitoring, and as in Figs. 8 and 9, only inputs from other high-centrality concepts were included.

To find out what information entered the feedback channels, all critical causal assertions with an effect on the critical A-concepts were analyzed. For Hitler, this cybernetic approach resulted in a further reduction of the relevant critical A-concepts down to two. They are A1 *Peaceful solution of the Sudeten German question* and A2 *Seeking a quick*

solution, one way or another. A check of the critical assertions affecting these two concepts revealed that all effects on A1 are negative while all effects on A2 are positive. This finding bears out Steinbruner's contention (1974: 138) that the mind has a general tendency to set up decision problems in terms of a single concept and to associate but a single outcome with the available alternatives. Hitler's single goal thus becomes *a quick solution, achieved one way or another*, because the alternative, a peaceful solution, is presented as being unlikely to happen.

Chamberlain's critical subgraph contains only one feedback channel to begin with: A1 *Finding a peaceful and just solution*, for which the prospects have been destroyed (C2).

To find out more about the inferential underpinnings of these single goals and to test Steinbruner's proposition that the mind imposes structure on uncertain situations by categorical inferences (1974: 110), all causal assertions and paths terminating in the critical A-concepts were examined. It was found that Chamberlain believed that prospects for peace had been destroyed by the German decision to use force and by the ultimatum-like form of the German memorandum (C13, C27). Obviously this type of reasoning must be considered rational rather than categorical.

Hitler, on the other hand, monitored three different factors through his feedback channels A1 and A2: acts of violence in the Sudeten German area (C2, C4), emotional

reactions (C3, C8), and military reactions (C9, P4). These three factors are based on predominantly non-concrete beliefs and even have V-concepts among their input variables. The supporting concepts include measures to reduce the probability of incidents (P6, P7, P8), emotional reaction (C1, C8), beliefs about the Czech character (C31), Czech tactics (C16, C18), convenient constraints (P12), attribution of blame (C10), as well as four different A-concepts, some of which are used repeatedly (A2, A3, A4, A6). Unlike Chamberlain's, Hitler's reasoning must therefore be considered categorical rather than rational, which supports Steinbruner's proposition that categorical inference is used to resolve uncertainty.

Thus far, the analysis has shown that the subjects did in fact reduce variety and did structure their problems in terms of single concepts to reduce uncertainty. This is done, of course, to create stability, which is the ultimate aim of a cybernetic system. In order to adapt, a cybernetic system often has to decompose its environment into different sub-systems which are stable over time. This is why Hitler pursues only one single goal: annexation of the Sudeten German areas, and this is why Chamberlain confines his efforts to one single aim: stabilization of Europe. Each man seeks to stabilize a confined area of his total concerns by bringing it into harmony with his belief system.

Steinbruner (1974: 95ff) lists five general cybernetic principles which govern the cognition of complex problems:

(1) inferential memory, (2) consistency (of values, aims, etc.), (3) reality (verifiability), (4) simplicity, and (5) stability. The preceding analysis has shown that the two cognitive maps are largely consistent with these principles and that they are a much more sensitive indicator of policy choice than utility, central concept, or causal path analysis. This confirms that the cybernetic analysis introduced here should be included as a valuable addition to cognitive mapping methodology.

5. DISCUSSION

5.1 Findings

The density values obtained for the two maps show a 20% higher figure for Hitler, which suggests a more complex net of causal interconnections. But a comparison with raw density shows that Chamberlain's figure is 38% higher than Hitler's (.0054 against .0039). It is difficult to know whether the plotted density is an artifact of the merging and elimination process or whether it represents the true density after due allowance for redundancy.

A look at concept frequency shows the opposite result. The raw value for Hitler (.03) is greater than Chamberlain's (.025), while the reverse is true for the plotted value. But in this case, a deliberate effort was made to reduce the number of variables to manageable size. The obvious

conclusion, therefore, is to regard both density and concept frequency as doubtful indicators.

Hitler's extensive use of V-concepts and A-concepts suggests that he is building a solid foundation for his actions. Chamberlain's predominant use of C-concepts and P-concepts suggests that he is trying to control events. However, while differences in the use of concepts may indicate differences in cognitive style, they could also be dictated by the strategies pursued by the two men.

More revealing are the references to utility, or value assertions by Axelrod's term. Out of Hitler's total of 19 value assertions, 17 are to German utility. Chamberlain's value assertions are evenly distributed among the participants and reflect an objectivity that is totally lacking in Hitler.

The fact that less than 4% of the linkage valences of both maps carry signs other than straight positive or negative indicates a very low level of belief ambivalence and is to be expected in this type of conflictual bargaining exchange. On the whole, Chamberlain's valences tend to be more positive than Hitler's. However, three quarters of his utility linkages are negative.

By far the most useful indicator employed in the analysis is cognitive centrality. Its importance stems from the fact that it is so far the only practical means of ranking variables for which a convincing case has been made (Lipset, 1963). A useful application of this measure, for instance, is the

isolation of critical subgraphs, which permits a division of the causal flow into major streams and tributaries.

The cognitive centrality value can be further improved by weighting. By combining preference for specific types of concepts (frequency) with the number of distinct references to them (centrality), a fairly powerful indicator of cognitive attention is obtained. Depending on whether the policy maker operates in the "representational" or in the "instrumental" mode, this indicator could mean that the particular central concept is a key factor in his deliberations, or that it is a point of argument to be driven home.

This mean concept category centrality is a powerful enough indicator to permit further conclusions. Hitler's A-concept centrality of 4.0, for instance, emphasizes his strong pre-occupation with immediate objectives, and by extension suggests inflexibility. His P-concept centrality of 1.9, on the other hand, indicates a low priority for institutionalized solutions or agreements.

The power of this indicator also lends some significance to the fact that all five of Chamberlain's high-centrality P-concepts are located outside the highlighted critical subgraph. Possible interpretations of this are that he did not wish to promote any of them in order to protect his flexibility as a mediator, or that their effect of dismembering Czechoslovakia was embarrassing to him. But this may well be pushing the power of the indicator beyond its range.

The two goal structures presented in Figs. 6 and 7 could obviously have been obtained with a great deal less effort by a careful reading of the source text. In fact, such a reading would have revealed a number of stresses in emphasis and presentation that are not conveyed by the goal structures. The absence of links and interconnections suggests that they do not tell much of a story and merely constitute an undifferentiated listing of stated intentions.

The causal chains present in the maps have been examined in detail because they provide the only evidence of how decision makers use conceptual structures to combine and process information.

There is an interesting correlation between causal path length and cognitive complexity. In both cases, the figures obtained for Hitler are close to 80% higher than those for Chamberlain. In addition, Hitler's map contains more than twice the number of paths.

Beside their low complexity, Chamberlain's cognitive paths are also extremely short. Most of them consist of only two variables and link to utility. The two paths containing three variables plus a utility link employ two of them twice, and they also constitute the highlighted critical path. The trouble with short paths, particularly if they are unconnected, is that one doesn't need a cognitive map to find them. They are likely stated this way in the source text and are readily accessible.

Hitler's net of causal paths is much more interesting in this respect. This may suggest that just as higher cognitive complexity is positively related to range of behavior (Shapiro and Bonham, 1973: 150), so greater path length may also be related to behavior. It may indicate intensity if path length reflects depth of conviction.

Imbalanced causal path effects are rare in the two cognitive maps examined, and where they do occur, they are explainable. This agrees with most of the studies surveyed. It also supports the cybernetic analysis, which has shown that decision makers tend to set up problems in terms of single preferences in order to avoid the need for trade-offs, since trade-offs violate the need for cognitive consistency.

The system of cycles found in Hitler's map owes its prominence to the fact that it contains only high-centrality concepts. The one exception is A6, which has a cognitive centrality of 2 and links the Sudeten German question to Anglo-German relations. One wonders why they are part of the cycle, since Anglo-German relations are unlikely to be uppermost in Hitler's mind as he considers Czechoslovakia. The answer would appear to be the reason for the cycle in the first place, which is to serve as a lever to obtain Chamberlain's acquiescence. Aside from justifying Hitler's aims, of course. This confirms that the cycles are not operating as feedback loops in a decision-making system but are used as a semantic persuasion device to demonstrate the inevitability of a crisis.

Two of the basic assumptions underlying the cognitive mapping approach are that decision makers use psycho-logic and that they refer to previous experience. Yet many more instances of both can be found in the source text than appear in the final maps. They were eliminated in the coding process because the coding rules are designed to extract abstract concepts. Yet often the use of psycho-logic and the substitution of personal knowledge and experience are based on concrete examples or historical analogies. Their elimination is only a disadvantage for this type of in-depth structural analysis, however, because ordinarily, the operative concept is the substance of cognitive mapping.

In order to check whether any important elements of the source text are not reflected in the full cognitive maps, a review was carried out which led to the following three observations:

1. In order to determine the type of inferences made or to assess the role played by psycho-logic and previous experience, it is necessary to reestablish the associations of certain key concepts. The assertions required for this are not always accessible because the coding rules (Wrightson, 1976: 318-320) specify that "exemplary specifications of the general causal relationship" and "historical analogies supporting the relationship" should not be coded because they are repetitious and add nothing new.

2. Passages containing proposals or straight information

tend to elude the coding process since they do not normally cause or effect anything. Yet they may be the substance of the communication. In a methodology that seeks to explain the processing of information, such elements should be incorporated in some form.

3. The coding procedure does not capture some forms of expression or presentation that may reflect beliefs, such as tirades, pleading, impatience.

For some research purposes it may therefore be advisable to modify the coding rules to meet the specific requirements of different analytical approaches.

A question of vital importance for cognitive mapping is to what extent the maps, or portions of them, are stable over time. Any attempt at prediction would depend on such stability. The reason why attempts in this direction have so far been only marginally successful (Axelrod, 1976: 230) may have emerged in the cybernetic analysis. It shows that - stable or not - a concept or belief must be *centrally involved* in a decision in order to influence it. Non-critical concepts appear to be of only peripheral importance, unless they support a critical variable.

This means that while the simple presence in a decision maker's conceptual inventory is a necessary requirement, it is not a sufficient one. Centrality is even more important in cognitive maps with a high degree of complexity and resultant greater range of potential options. Kirk (1976: 90)

sums it up this way:

"... since beliefs depend upon the context in which they are connected, defining a person's set of beliefs at one point (t) and trying to explain perceptions or behavior at another point (t+1) may be erroneous since the configurations of stimuli may have changed."

Recognizing that a concept must be centrally involved in a decision problem to be effective may also bring us closer to answering the fundamental question of this study, which is whether the crucial factor in policy-making is the empirical world or the cognition process of the decision maker. Perhaps the answer lies in the form of a cognitive map rather than in its substance. It may be that the more a cognitive map is simplified and adaptive in the cybernetic sense, the greater will be the role of structure, and the less it is adaptive (i.e. the more it is analytic and calculated), the more the actor will be independent and venturesome. Steinbruner (1974: 84) hints at this in his discussion of styles of architecture when he compares adaptive (primitive, functional) and analytical (modern, designed) structures. There is evidence to support this proposition in both cognitive maps.

A similar proposition may be derived from the fact that Hitler's reasoning tends to be categorical while Chamberlain's is rational. Empirical structure must be reduced by linear regression to achieve its full effect on a decision, and not by categorical inference. One may therefore state that the

more categorical the style of cognition, the less predictable will be the effect of empirical factors.

5.2 Cognitive Style

The two cognitive maps examined lend themselves well to a comparison of cognitive styles. They are based on an identical issue in an identical context at an identical time, and although some of the frequency data used are not comparable in the strictest sense (different base size), the maps still are a perfect match, because both men had the fullest opportunity to express their thoughts as they felt the occasion demanded.

A first difference lies in the style of inference used. While Chamberlain reasons rationally, Hitler reasons categorically. A second difference is Hitler's almost exclusive concern with German utility. Chamberlain shows a much more balanced concern for the countries as well as for the individual people involved. But while Chamberlain's causal linkages tend to be positive, his utility linkages are predominantly negative.

There is a marked difference in the cognitive complexity shown by the two men. Hitler's is much greater than Chamberlain's, and his map also contains twice the number of causal paths. They are on average almost twice as long, and they have more than double the range of assertions. Chamberlain's causal paths appear sparse and undeveloped by comparison

and they lack V- and A-concept bases. All his paths are balanced, however, while Hitler's show some imbalance.

Hitler's map contains a highly central system of cycles, and a considerably larger number of his concepts have high cognitive centrality values (up to 15). His map also contains a considerably larger number of A- and V-concepts, with significantly higher centrality values. This indicates that immediate objectives and values are much more crucial in his thoughts than in Chamberlain's. Conversely, Hitler's smaller P-concept centrality points to a smaller role in his thinking for policy alternatives. This is supported by the fact that there are only two critical P-concepts in his map, compared to five in Chamberlain's.

What emerges from this comparison of cognitive styles is that Hitler is far more determined and much more single-minded in the aggressive pursuit of his immediate objectives than Chamberlain, and that he draws on a rich and complex belief structure to justify these objectives.

Chamberlain's cognitive style appears to be the complete opposite. He is reasoned and impartial to the point of being passive. His pragmatic and balanced approach almost seems weighed down with a sense of futility.

5.3 The Dependent Variable

The reason for supporting the interpretation of the two cognitive maps by a broad methodological inventory of the

literature and by such a widely cast analytical net was to try to push cognitive structure analysis beyond the evaluation of decision-making technique into the treacherous field of explaining behavior.

In the preceding pages, about twenty nomothetic measures or analytical concepts have been discussed and probed for their ability to serve as indicators of specific cognitive characteristics. In the following, an attempt will be made to treat a number of these as intervening variables between policy environment and policy choice or behavior. However, since few of them were stated as formal propositions and since, moreover, this study was not designed to test specific hypotheses, this exercise obviously lacks scientific rigor and is offered more in order to stake out some claims for the policy relevance of the cognitive mapping approach, to be worked subsequently if they are found to assay high enough.

Because Hitler's map offers a wider range of features, it will be discussed first. Its style is clearly *instrumental* or persuasive, because of its low belief ambivalence, its reinforcement cycles, and its high level of redundancy. The cybernetic reduction of variety narrows Hitler's primary aim down to an uncompromising imposition of his idea of a Czechoslovakian solution. The low cognitive centrality and the relative isolation of his P-concepts suggest that alternative avenues of solution were hardly considered. The only P-concept appearing in his critical subgraph is military

countermeasures, hardly a conciliatory move.

Hitler's critical subgraph further shows his complete preoccupation with highly charged, conflictual concepts. His cognitive focus, the *intolerable situation in Czechoslovakia*, has the highest centrality in the map. What is revealing, however, is that remedial concepts like the *Return of the 3 million Germans in Czechoslovakia* and *Holding a plebiscite in the Sudeten region* stand in complete isolation from the map focus. Hindsight now confirms that they only served as a pretext for the destruction of Czechoslovakia and that Hitler had already decided on the use of force. Hitler's aim in the talks was to persuade Chamberlain of the inevitability and the justification of this.

This deliberate confrontation is theoretically supported by Hitler's *analytical* style, as evidenced by his low response variety and categorical style of inference. His non-adaptive and intransigent temperament seeks to dominate his environment, and it is fueled by considerable energy (cognitive redundancy, cycles), conviction (considerable length-of causal paths) and total Germanocentricity (utility links).

Chamberlain's cognitive map, unlike Hitler's, indicates much greater cybernetic adaptation. He monitors five alternative solutions in his critical subgraph, although his attention is about equally divided between P-concepts and C-concepts. A comparison of the maps shows that Chamberlain's cognition is highly reactive and essentially limited to responding

within the context set by Hitler's belief structure and initiatives.

Chamberlain did not influence Hitler because he did not oppose him. It might be useful, in the light of Axelrod's (1977: 743) finding about the effectiveness of a novel-arguments strategy, to speculate what the outcome of the talks might have been had Chamberlain countered with a phalanx of highly central A's, closely supported by appropriate V's, and connected to a rich network of utility paths. In other words, if he had opposed Hitler with a determined French-Czech-Polish stand, backed up with convincing factual support, and thus forced him into a different strategic perspective.

Instead, the contrary was true. A review of Chamberlain's map suggests that he did not disagree with Hitler's claims. Aside from the *Security of Czechoslovakia*, Chamberlain argues only one other principle: the *Right of self-determination*. His quarrel is not with Hitler's aims; it is with his method of obtaining them by military force.

5.4 Validity

An ever present problem in content analytical research is the extent to which assertions reflect the actual beliefs of an individual, in other words, the problem of validity. Axelrod (1976: 252-256) devotes a detailed discussion to this question. He reviews the issue of the sincerity of a communication, the various reasons for which beliefs may not be

stated, and the limitations which this imposes on the inferences drawn from cognitive maps.

The selection of highly confidential source material for this study should eliminate some of the obvious shortcomings associated with the use of public documents. On the other hand, the minutes clearly fall into the category of "instrumental" rather than "representational" communication (Holsti, 1976: 44). The purpose of the talks was not a disinterested exchange of views but a highly motivated effort to change views. Still, the risk of accepting a complete misrepresentation is somewhat reduced by adopting a holistic approach to cognitive mapping. De Sola Pool (1959: 1) writes that research into cognitive structure

"involves both affective and cognitive components. These components interact intimately with one another, so that cognitions about attitudinal objects are not felt to be meaningfully analyzable without consideration of affective forces."

These affective forces emerge as properties of cognitive style and represent a means of checking for holistic consistency.

Hart (1977: 138) puts the question of validity more specifically and asks:

"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?"

Well, no one ever claimed that cognitive maps make good

lie detectors. The only possible reply is: Who knows? Both, no doubt. The only effective control of international honesty seems to be domestic political constraint. And while often that does not seem very effective either, it must have been what Axelrod (1976: 6) had in mind when he declared that as long as cognitive maps accurately reflect the assertions made, they need not be consistent with private beliefs to be valid. To accept this view is of course to significantly reduce their policy relevance and their predictive capability.

To provide some historical indication of the validity of Hitler's map, the following three options outlined by Hitler in a conversation with General Keitel on April 20, 1938 are quoted from Telford Taylor (1979: 387-88):

1. A strategic surprise attack without justification won't do, because hostile world opinion would lead to a critical situation.
2. Action after a period of diplomatic clashes, which gradually come to a crisis and lead to war.
3. Lightning-swift action as the result of an incident (e.g. assassination of the German ambassador in connection with an anti-German demonstration).

Hitler's instructions to the military were to prepare for options 2 and 3, and he considered option 2 less desirable because Czechoslovakia would have taken precautions.

There are two further, minor aspects of the source text that may affect validity: the fact that it was prepared in minute form by a third party, and the fact that a translation

was used. Regarding the first, it can be assumed that the minutes are based on Schmidt's interpreter's notes which, since they were transcribed while his memory was still fresh, can be relied upon to be detailed and faithful. Regarding the possibility of distortion in the translation from German into English, its effect - because of the very extensive aggregation in the coding and merging process - is likely to be less than that of a complete omission from the minutes.

6. ASSESSMENT

The overall objective of this study was to find out how empirical structure is translated into perception. The answer, of course, varies, and two approaches to more specific research into this question suggest themselves. One is to analyze the C-concepts (beliefs about events) for their centrality, their contribution to causal chains, and their effects on V, A, P, and utility concepts. The other is to determine the extent of cybernetic simplification and the type of logical inference employed (categorical or rational) in order to draw conclusions about the influence of the empirical environment on policy.

The second question which cognitive mapping attempts to answer is how perception is translated into behavior. The results of the cybernetic analysis have shown that it is possible to explain certain cognitive dynamics intervening between perception and policy choice by examining how variety

is reduced and how uncertainty is controlled by either rational or categorical inference.

The evaluation of the body of findings obtained in the course of this study has added a number of nomothetic relationships and propositions to the existing cognitive mapping methodology. These were then employed to offer a cognitive mapping explanation of the policy behavior of the two subjects analyzed. This explanation was achieved with maps which, because of their instrumental nature, differ considerably from the type of open policy discussion that Axelrod and other researchers have been using in their work.

In employing research material from an international bargaining setting, this study has been successful in opening a new and richer field to cognitive mapping research.

An attempt to employ previously proposed methods to explain belief formation by analyzing the imbalanced causal paths, and to describe the integration of new information by tracing the effect of the Czech mobilization produced inconclusive results.

In order to compare the findings of this study with the claims advanced for cognitive mapping in the literature, the three categories of summarized claims listed earlier were reviewed:

- (1) The synthetic use of cognitive maps as an organizing device to aid decision-making was not examined in this study. However, it was shown to be a useful application in the study

by Roberts (1976), and while it might be argued that such a reconstitution of the policy input would often amount to a circular rediscovery of policy considerations, it might still be helpful in cases where the decision problem is highly ramified and complex.

(2) The potential of cognitive mapping for influencing decision makers obviously deserves greater consideration. Axelrod's pioneering efforts (1977) in this direction are interesting. His conclusion that a "novel-arguments" approach may be a more effective negotiating tactic than defense and attack is further supported by the cybernetic analysis carried out here. It seems reasonable that it is easier to disturb a well established cybernetic cognition system by creating new variety and a new set of uncertainties than by trying to change a homeostatic subsystem. It also stands to reason that it is easier to influence a known belief system than an unknown one.

(3) The third set of claims has been subsumed here but really does no more than set out some of the pre-theoretical underpinnings of the cognitive mapping approach and therefore cannot be discussed further until a body of theory has been formulated and tested. This still needs to be done.

It is clear from this assessment that the analysis of cognitive maps succeeds in introducing some rays of light into that often quoted black box which intervenes between

22

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the international system and decision maker response. We should therefore consider whether the approach merits a place in the array of international relations research methodology.

As a start, we ought to review competing approaches to see what cognitive mapping offers that is unique. Kirk (1976: 226) in her complete review of the literature on the perceptual paradigm offers this observation:

"... models of perception and perception change should be developed that relate perception to behavior and feedback to perception changes." ...

"Complex descriptive decision models may play a useful role in this development, and cognitive mapping techniques and computer simulation may prove valuable tools in the long run to test the dynamic workings of the models that use empirical data."

The operative phrase in this quote is "relate perception to behavior and feedback to perception changes." The only other developed approach that attempts to infer knowledge about behavior from a set of beliefs is the *operational code* approach (George, 1969). But operational codes, except for being congruent with behavior, or possibly exhibiting co-variation, are limited in their ability to explain or predict behavior.

If behavior is to be inferred from belief, the subject must perceive the belief to be relative. That central involvement in the cognition process is required was clearly shown in the preceding study. But to demonstrate the effect of a belief would appear to be difficult for the operational code.

It is a general construct which is thought to be variable across time, issue areas, or even audiences and undergoes significant transformations depending on the dominance of different subsystems.

Cognitive mapping, on the other hand, could be said to represent the analysis of the specific subsystem of a policy maker's total belief system that is directly involved in the cognitive process leading to a specific choice behavior.

Putting the difference in terms of policy relevance, one could speculate that a series of cognitive maps of a particular policy maker, collected over time and issue areas, might well be used to construct an "operational code"-like belief system with at least explanatory capability. But it would not be possible to construct a specific cognitive map about an international event by using a policy maker's "operational code." For one thing, the code does not use specific event references and therefore lacks direct correspondence, and for another, cognitive maps are inductive while operational codes are deductive in their application, and neither has yet produced theory capable of serving as a prism at their common focal point and of specifying the rules of transfer between map and code, as well as the required scope conditions.

Another important contribution of the cognitive mapping approach is that it provides the only method available to date which is capable of reliably tracing the boundaries of an international event for decision-making analysis.

The cybernetic approach introduced in this study augments the range of analysis possible. It demonstrates that the rules of cybernetics apply to cognition and that they can be used to explain policy choices. It broadens the use of cognitive centrality as an indicator and employs concept categories to indicate behavioral orientation.

An essential element in determining the merit of an approach is its analytic power. While most of the work done with cognitive maps so far has been descriptive, some of the studies have tested correlations (Hart, 1976, 1977; Shapiro and Bonham, 1973) and this study has suggested additional propositions about correlations (type of reasoning/type of behavior; extent of adaptation/effect of empirical factors). The proposition that cybernetic rules determine policy choice would seem to be explanatory. Based on the findings presented here, the cognitive mapping approach therefore has the potential for explanatory power. Whether a predictive capability can be developed, only considerably more longitudinal work will be able to tell.

The relevance of cognitive mapping for both international relations theory and practical policy analysis has now been adequately established. What has not been mentioned are its limitations. The first and most important one is the general inaccessibility of classified salient source material for analysis. The academic researcher at least is restricted to government documents that are released decades after the event,

after careful screening. And not many states take the publication of the records of high-level policy meetings very seriously.

The use of public documents is unfortunately beset by all the well-known theoretical and practical problems, not the least of which is questionable validity.

A second limitation is the relative lack of parsimony. One of the major advantages of the approach, which is its ability to make use of coder judgement and discernment to identify context-related causal or value assertions, also excludes every possibility of automating the extremely laborious coding process.

7. CONCLUSIONS

To claim that cognitive mapping is international relations theory would be premature. In part perhaps because of the formidable limitations mentioned, relatively little work has been done with it so far. The available knowledge does not amount to a full set of axioms and theorems that would allow researchers to state, for example, that two cognitive subsystems with the same cognitive complexity and concept category centrality will produce the same behavioral rigidity or rate of behavioral change irrespective of elapsed time. But the approach is certainly moving beyond the stage of pre-theory. It has produced some interesting research and some knowledge. Research tools have been developed and refined.

And although few hypotheses have been explicitly tested, some interesting properties of belief structures, such as their stability,, their complexity, and their centrality, are available as independent variables. In this study, an operational principle has been identified as well, and an attempt was made to demonstrate the explanatory potential of cognitive mapping.

Future research may define different types of causal chains, cycles, or cognitive styles. It may lead to a better understanding of the feedback process, of the relationships between chronological and issue-related cognitive subsystems, of the principles of system transformation. It is believed, for instance, that a discovery can instantly change entire conceptual paradigms. What are the mechanisms of such a change? And how can knowledge about them be applied to international relations, which Wright (1955: 429) described as being "in large measure relations between beliefs about nations, not between actual nations."?

In short, there are many interesting projects which by themselves should encourage further research, but perhaps faith in the potential of the cognitive mapping approach ultimately resides in its heuristic value. If we believe that cognition and choice behavior are the expression of the same belief structure and its dynamics, we thereby recognize that meaning, thought, and action are indivisible. It was Rollo May (1969: 230) who said:

"Meaning has no meaning apart from intention. Each act of consciousness tends toward something, is a turning of the person toward something, and has within it, no matter how latent, some push toward a direction of action."

It is this holistic dependence which the cognitive mapping approach tries to tap for insight.

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