CRISIS MANAGEMENT: PSYCHOLOGICAL AND SOCIOLOGICAL FACTORS IN DECISION MAKING

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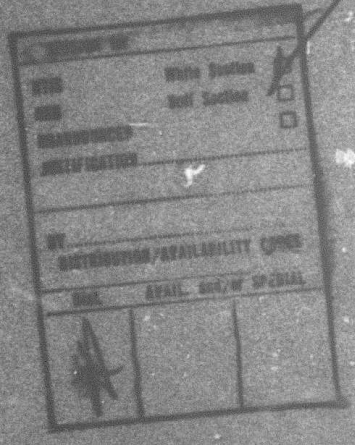
Block 20. Abstract

Some fifteen areas were identified in which we could conclude that statements of relationships were well supported and could serve as the basis for policy implementation. The most important of these focused on the negative effects of time pressure, the breakdown of analytical abilities in crisis, the effectiveness of established vs. *ad hoc* groups, and the difficulties of information processing. Another twenty-three areas were identified as those in which research has produced insufficient or contradictory evidence and the subject matter is of sufficient importance to warrant further study. A final chapter deals with the implications of the research findings for crisis management.



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CRISIS MANAGEMENT:

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SUMMARY

TITLE: Crisis Management: Psychological and Sociological Factors in Decision-Making.

ABSTRACT: This Final Technical Report summarizes the two phases of a study designed to assess the possible contributions of psychological and sociological literature to improving the management of foreign policy crises. In Phase I, after a systematic search of the literature, the research findings of over 100 studies were synthesized into 81 propositions that relate to the influence of individual and group-level factors on the effective performance of decision-making tasks in crisis management. In Phase II the research literature was evaluated in order to assess the state of the art. Some fifteen areas were identified in which we could conclude that statements of relationships were well supported and could serve as the basis for policy implementation. The most important of these focused on the negative effects of time pressure, the breakdown of analytical abilities in crisis, the effectiveness of established vs. *ad hoc* groups, and the difficulties of information processing. Another nineteen areas were identified as those in which research has produced insufficient or contradictory evidence and the subject matter is of sufficient importance to warrant further study. A final chapter deals with the implications of the research findings for crisis management.

BACKGROUND: The task of resolving international crises typically falls to individuals and small decision-making groups. The behavior of the former is the focus of psychological literature and the behavior of the latter is the focus of social psychological and sociological literature. There is a growing body of research in these fields that shows the relevance of psychological and sociological factors to decision-making behaviors. A better understanding of how these factors operate and how they are affected by crisis-derived stimuli should provide guidance as to how individuals and groups can be better selected, organized, instructed, and managed so as to permit more effective performance of crisis management tasks. This is particularly important because these people are dealing with questions of high risk under conditions of severe stress brought on by the surprise, time pressure, high threat, and uncertainty that are the defining characteristics of a crisis. The negative effects of these aspects of crisis on group and individual behavior have great implications for the manner in which the Defense Department manages a crisis.

The problem we are faced with is how to apply the research, conducted for different purposes and in different contexts, to the problems of government officials. In order to lay the groundwork for improvements in crisis management, it was necessary to tie this large body of literature together in some summary form, as well as to evaluate its applicability to foreign policy crisis management. A two-phase project to undertake both of these tasks was designed by

Human Sciences Research, Inc., in consultation with the Human Resources Research Office, Advanced Research Projects Agency.

OBJECTIVES: The overall objective was to assess the state of the art in sociological, social psychological, and psychological studies of decision-making and, particularly, decision-making under stress. A number of more specific objectives guided the research:

- To conduct a systematic search of the literature in psychology, social psychology, and sociology to identify all important areas of study and research works related to the performance of tasks involved in the management of foreign policy crisis.

- To review each piece of literature judged relevant to the project in order to abstract the research findings, along with information on definitions of variables, measurement, research design, and strength of the evidence.

- To connect related findings from the literature into more general propositions that summarize the important relationships between psychological and sociological variables and the performance of decision-making tasks.

- To evaluate the literature in order to identify (a) those propositions about behavior that have been supported by the research evidence, do not require further research, and can serve as the basis for policy implementation, and (b) those propositions that either have not been researched at all or on which there is insufficient and/or contradictory evidence, and that state relationships which are important enough to warrant further research.

APPROACH: The first task of the project, to accomplish the first objective, was to identify sources—articles, chapters in books, whole books, and research reports for government contracts—which appeared to deal with psychological and sociological aspects of decision making in crisis. First, three computer-based bibliographic searches were undertaken, from the Defense Documentation Center, the National Technical Information Service, and the Psychological Abstracts Search and Retrieval (American Psychological Association). Second, the bibliographies of various literature reviews and other general works provided many references. Finally, we constantly added to the list of possible sources as we reviewed literature and found relevant citations.

After deciding that a particular research study was relevant to the project, research personnel then reviewed that work using a standard format to note the title, write a *precis*, abstract the findings in the form of statements of relationships between variables, and write a brief evaluation of the work. Over one hundred studies were judged relevant to the project. The reviews of these provided the basic data for our analysis.

The third task was to connect related findings from the literature into more general propositions that would state important relationships between psychological and sociological independent variables and the dependent variables related to the performance of crisis management tasks. This was accomplished by laying out the individual research findings in a big matrix of independent variable by dependent variable, where each cell was a hypothesis. Using this as a visual guide to connections among research findings and using our reviews of the literature, we were able to summarize the findings of the literature into 81 propositions. These were then organized for presentation into a framework that can account for all the major psychological and sociological phenomena that have been studied in relation to decision-making in crises, can be readily enlarged and elaborated by the inclusion of more information about these phenomena, and can expose gaps in the explanatory linkages between different sets of variables.

The fourth task, undertaken in Phase II, was an evaluation of the propositions drawn from the literature in order to assess the state of the art. The evaluation was based upon three criteria to differentiate between relationships supported by the research and those not supported. The criteria for a proposition to be considered substantiated are:

1. the relationship is supported by two or more research studies;

2. the research is valid from a methodological standpoint;

3. the proposition has been studied in the context of "real-world" decision-making or seems intuitively applicable to "real-world" situations.

Those relationships which do not meet these criteria and therefore are not substantiated include areas in which there is no research, there are insufficient and/or contradictory findings, and there is doubt about the transferability of the relationship to crisis management.

RESULTS:

Substantiated propositions. In the evaluation of the literature, fifteen areas of substantiated knowledge about crisis management were identified, seven concerned with individual decision behavior and eight with group decision behavior. The most important of these areas are:

1. In a crisis situation, there is a breakdown in the intellectual abilities of the individual in terms of processing information, assessing the environment, and analyzing alternatives.

2. The greater the perceived time pressure, the smaller the number of alternatives considered, the greater the likelihood that decisions will be made before necessary, and the greater the likelihood of incorrect choice of alternatives.

3. The performance of crisis management tasks is better for established groups than for *ad hoc* groups.

4. In a crisis, there is a great increase in the information load, with the result that information gets "selected out" and new information is not integrated with previous decisions.

5. The greater the stress, the greater the likelihood that perceptions of the environment will be distorted.

Other areas of substantiated knowledge are presented in Chapter 9.

Unsubstantiated propositions. Many findings emerge from the literature that state important relationships, but the evidence is inconclusive as to their validity. Of the nineteen such areas that were identified, the most important are:

1. The identification of the threshold point at which the effects of increasing stress change from positive to negative.

2. The inability to define the nature of the threat in a crisis.

3. The extent to which the individual decision-maker is prone to maladaptive emotional responses under stress.

4. The effects of the incidence of crisis on administrative viability and the performance of specific decision-making tasks.

5. The mechanisms by which the group adjusts to information overload and the specification of information requirements

6. The effectiveness of alternate organizational structures.

Other areas of unsubstantiated propositions are presented in Chapter 10.

IMPLICATIONS: In Chapter 11, we draw a brief picture of the implications of our research for crisis management in the Defense Department. In many cases the propositions point directly to requirements for effective crisis management. In other cases, recommendations can be made only by extending the research findings in a logical analysis. Of the implications presented in the final chapter, the most important are:

1. Early diagnosis of a crisis is vital; as a corollary, everything possible should be done to extend the amount of time available before a decision has to be made.

2. Procedures should be established to correct for one of the severe limiting factors in formulating an effective response to crisis—the inadequate analysis of alternatives, both in terms of number and creativity.

3. Crisis management tasks should be undertaken by an established group operating according to regularized procedures.

4. Mechanisms must be established to insure the collection of information that allows for accurate perception of the environment, is integrated with past decisions, and is transmitted to the proper individuals.

5. The negative effects of stress and fatigue can be alleviated in a number of ways, including training programs.

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PART III. EVALUATION OF RESEARCH FINDINGS

PART I

THE INDIVIDUAL LEVEL

CHAPTER 1

ORGANIZATION AND APPROACH

The task of resolving international crisis typically falls to small decision-making groups. A growing body of literature shows the relevance of psychological and sociological factors to the group decision-making processes. A better understanding of how these factors operate and how they are affected by crisis-derived stimuli should provide guidance as to how decision-making groups can be better selected, organized, instructed and managed so as to permit more effective and timely decision-making under crisis conditions.

The overall objective of the study, therefore, is to assess, and to recommend ways of improving, our knowledge of the psychological and sociological processes involved in group decision-making under crisis conditions. In Phase I (Parts I and II of this Report), we have endeavored to organize and interpret the existing knowledge from psychology, sociology and social psychology which bears on the decision-making behaviors of individuals and groups. In Phase II (Part III) we have evaluated this existing knowledge in terms of areas of substantiated and unsubstantiated findings. In both phases a prime consideration is knowledge in the service of those who are tasked with the management of decision-making under crisis. This ultimately is our test of the relevance of existing knowledge, of the areas in which we will seek to improve and extend knowledge, and of the practical implications to be drawn from such knowledge.

Later in this chapter we will have more to say about the matter of relevance, credibility and utility of the resultant findings. Here we describe how the survey was conducted and how we organized our findings.

Literature Survey

The first task in this phase was to identify sources—articles, chapters in books, and whole books—which appeared to deal with psychological and sociological variables related to decision-making- e.g., stress, cognition, perception, group structure, communication, etc. We then reviewed over one hundred of these sources using a standard format for abstracting the

pertinent information. These included an identification of the independent and dependent variables, a statement of the observed relationships between these variables, a summary of the observations made, and an evaluation of the strength of the supportive evidence. The primary output of this task consisted of sets of findings which could be stated as propositions.

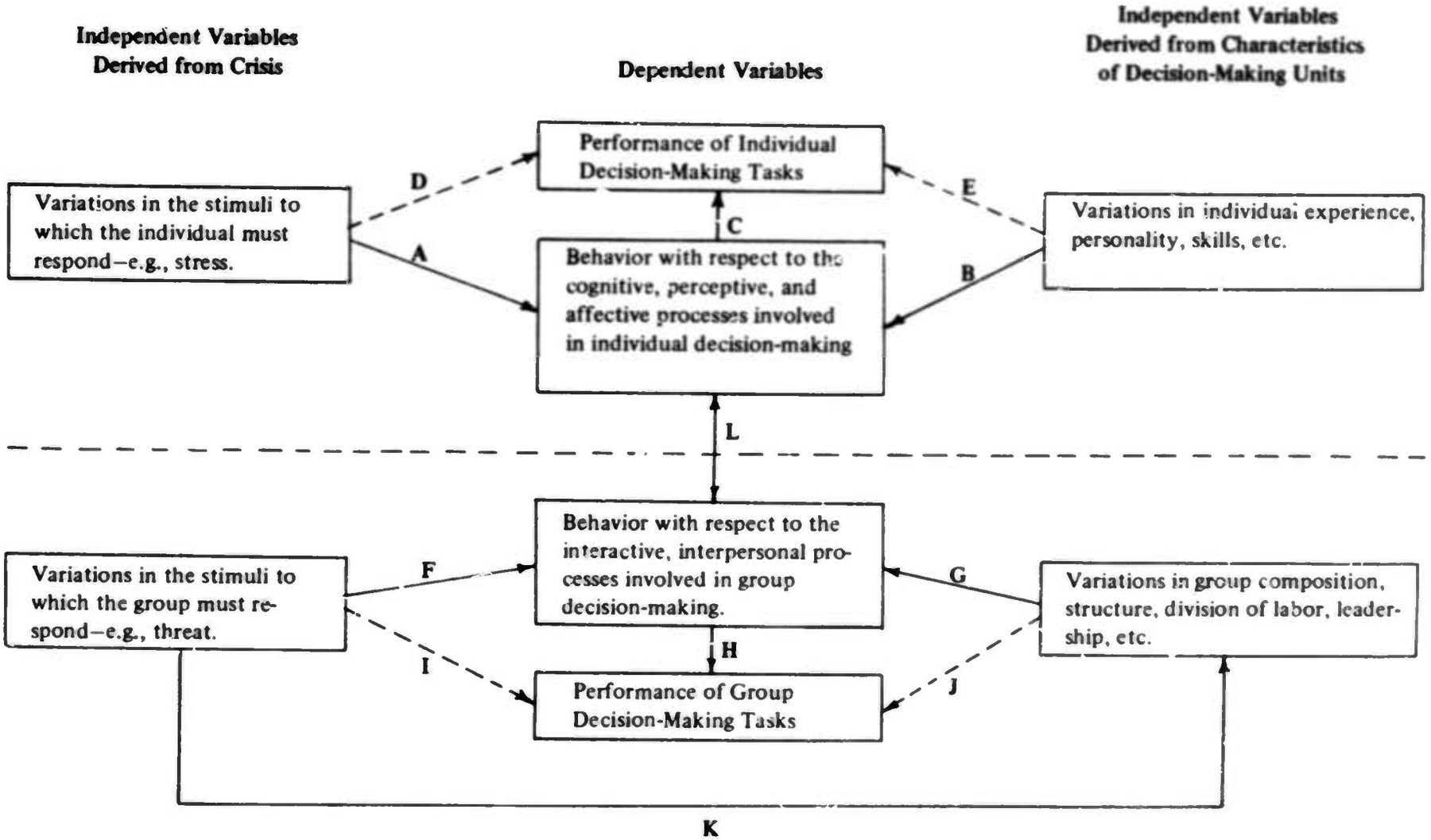
Organizing the Findings

The second task was to organize these propositions into a framework. In the early stages of model building, before we had actually undertaken the literature search, it seemed that the most meaningful set of dependent variables—from a management point of view—would be the elements of an effective decision-making process. We considered six such elements, arranged in sequential fashion starting with situation diagnosis and ending with implementation of alternatives. We assumed that the literature would tell us how various psychological and sociological factors, under the influence of crisis, cause these elements to operate in a less than rational manner. As it turned out the dependent variables in the literature did not conform to this *a priori* breakdown of the decision-making process, and we found it impossible to organize the literature on that basis.[1] Using a more empirical approach we developed a matrix of dependent and independent variables and then sorted our propositions out into the cells of this matrix. We then considered how these cells might be linked to show the relationships between different types of phenomena in the crisis decision-making process. We experimented with a number of "models" of this sort and finally settled on the one shown in the accompanying diagram.

We are satisfied that this framework has the following characteristics: (1) it can account for all of the major psychological and sociological phenomena that have been studied in relation to crisis decision-making, (2) it can be readily enlarged and elaborated by the inclusion of more of the existing information about these phenomena, and (3) it can expose gaps

[1]Such a frame may, however, be useful in laying out simulation/experimentation in which the specific aspects of crisis decision-making can be studied.

FRAMEWORK FOR THE ORGANIZATION OF PROPOSITIONS



in the explanatory linkage between different orders or levels of phenomena. These points require some clarification.

There are twelve types of propositions which structure the field of crisis decision-making. In the diagram these are represented by arrows connecting sets of variables in boxes. Of these, eight types of propositions constitute the "ideal" dimensions of the field in the sense that they conform to our theoretical view of the crisis decision-making process as involving human actors as individuals or groups. These links that comprise the "ideal" theoretical framework are indicated by solid line arrows. Logically something useful could be said about any one of these particular relationships; in reality the literature says a great deal about some of these sets of relationships and very little or nothing about others.

The literature also contains propositions which we consider less appropriate to our ideal framework in that they by-pass the psychological and sociological processes involved in decision-making. That is, these propositions connect an environmental variable to a decision-making output variable without considering the individual or group that is affected by the environment and that in turn produces output. These propositions thus have little theoretical meaning. There are four of these, indicated on the diagram by the dotted line arrows. We have included these "actorless" propositions as being relevant at this stage of assessing the state of knowledge. In the future, as research is conducted to flesh out the theoretical framework, we would expect to replace such propositions with ones that speak to the psychological and sociological processes involved in decision-making.

It will be helpful at this point to describe each of these sets of propositions and to indicate how they relate to the body of empirical evidence which will be discussed in the several chapters of this report. For convenience and to avoid confusion with chapter numbers, we have labeled the twelve propositional sets with letters. As each is discussed below we will indicate where, if at all, it is treated in the analytical chapters to follow.

Proposition Set A

This set deals with the effects of crisis-derived stimuli on the psychological responses of the individual. Under crisis conditions individual decision-makers perceive various types and levels of surprise, threat, risk, time pressure and uncertainty. Collectively these perceptions induce stress by making the individual feel that he must respond effectively but under conditions which place abnormal or extreme requirements on his time and physical and mental resources. Stress in turn affects his cognitive and perceptive faculties and his affective states of mind, all critical variables in the decision-making process.

Chapter 2 discusses this set of propositions drawn mainly from the psychological literature and experimental situations.

Proposition Set B

This set deals with the effects of individual characteristics upon the psychological processes involved in crisis decision-making. Individuals differ in their experiences, personalities and skills and these differences in turn affect the way people perceive and interpret cues and signals, the way they perceive alternative responses and select information, and their ability to manage the affective by-products of stress.

Since our propositional inventory did not discover any useful propositions of this sort we have not devoted a chapter to the set. Subsequent research may require such a chapter; in any case, from a theoretical and management standpoint "there should be something" here. The fact that there is not indicates an important gap in the literature.

Proposition Set C

This set deals with the effects of psychological processes on decision-making. As these processes—cognition, perception, affect—are altered by crisis, and by different individual reactions to crisis, so they in turn alter the processes of decision-making and the performance of individual decision-making tasks.

Thus in Proposition Sets A and B, the psychological processes involved in decision-making are dependent variables with respect to crisis and individual characteristics, but they act as intervening variables between these independent variables and the dependent variable of the performance of d. ion-making tasks.

We have propositions for this set but we have not devoted a separate chapter to them because we have found them only as integral parts of propositions occurring in Set A where the connecting link A-C is made in the same or related statements from the same piece of research.

Propositions Sets D and E

These sets deal with the direct effects of crisis-derived stimuli and individual characteristics upon the performance of individual decision-making tasks. Thus propositions in these sets tend to treat the intervening psychological processes as a "black box." In Set D the propositions deal with the effects of stress on elements of decision-making—i.e., choice of goal, search for alternatives and choice of alternatives. In Set E they deal with the effects of different amounts of experience and propensities—e.g., motivation levels, proneness to take risks, dogmatism—on the same series of decision-making tasks.

Since there are a number of propositions in each set we have devoted a chapter to each. Chapter 3 covers the propositions of Set D and Chapter 4 those of Set E.

Proposition Set F

This set deals with the relationship between crisis-derived stimuli and the interactive processes within decision-making groups. By interactive processes we mean the way individuals in a group relate to one another on an interpersonal basis; this includes their patterns of communication with one another, their perceptions of one another, the kind of cognitive and affective signals they transmit, the level of consensus or conflict that exists among them, the extent of commitment to group goals, their mode of participation in group

activities, etc. All of these things bear on how effectively a group accomplishes its decision-making tasks.

Chapter 5 discusses this set of propositions.

Proposition Set G

This set deals with the relationship between group characteristics and the interactive processes within decision-making groups. By group characteristics we mean how the group is structured and composed—i.e., the division of labor into various kinds of prescribed roles and role relationships, the selection of people to fill these roles, the allocation of authority and responsibility among roles, the formal organization of channels of communication within the group, etc. These variables obviously have a determining effect on how people interact in the performance of any task.

Chapter 6 discusses this set of propositions.

Proposition Set H

This set deals with the effects of variations in the interactive, interpersonal behaviors of a group on decision-making. As these processes are altered by crisis conditions and by the way the group is structured to meet the crisis, so they in turn alter the performance of the group's decision-making tasks. Thus in Proposition Sets F and G the social psychological processes involved in decision-making are dependent variables with respect to crisis and group characteristics, but they act as intervening variables between these independent variables and the dependent variable of the performance of group decision-making tasks.

Propositions which fall into this category are included in Chapters 5 and 6 as they make the link between environment and group characteristics and decision-making performance. Hence we do not have a separate chapter dealing with Set H.

Proposition Sets I and J

These two sets of propositions deal with the direct effects of crisis-derived stimuli and group characteristics upon the performance of decision-making tasks. Thus propositions in these sets tend to by-pass the interactive processes involved in group decision-making; they focus on the effects of the independent variables (crisis stimuli or group characteristics) on the group's performance of such tasks as choice of goal, generation of alternatives, choice of alternatives, etc.

Chapters 7 and 8 discuss these two propositional sets.

Proposition Set K

This set deals with the effects of crisis-derived stimuli on the way decision-making groups are organized and composed. While we do not have many propositional findings for this set, observations of behavior in the Cuban missile and Korean invasion crises indicate that it is an important link in the model. Here the decision-making groups were structured according to how two different Presidents perceived their respective crises, and the decision-making processes were different. The kinds of propositions we would look for here are those that relate perceptions of crisis to the use of established vs. *ad hoc* groups, centralized vs. decentralized controls, homogeneous vs. heterogeneous composition, etc.

Proposition Set L

This set deals with the interaction of two kinds of dependent or intervening variables—individual psychological processes and group interactive behaviors. We have not found any propositions for this set, but theoretically there should be a link here which is important in the management of decision-making groups. For example, individual reactions to stress may include such things as increase in repressive tendencies and other forms of negative affect, and we can assume that these affect group effort in some way. Similarly, interactive processes in a group may be such as to raise or lower individual stress.

The propositional framework which we offer requires some explanation in the light of prior attempts to systematically inventory propositions and to construct models with them. Hermann's propositional inventory is probably the most comprehensive of such efforts.[2] It is basically eclectic, representing different kinds of theoretical interest, and there is no attempt to impose any sort of overall framework other than cataloguing and ease of reference. Many of the propositions—i.e., those that refer to psychological or sociological process—are readily incorporated into our own framework.

The Collins and Guetzkow model[3] of the group decision-making process appears most like the model we have developed here, and since several of their propositional sets fit almost exactly some of our own, portions of our frame look much like portions of theirs. The principal differences between the two models, in general, are that Collins and Guetzkow do not distinguish "crisis" as a special set of independent variables, or passive from active types of propositions, or theoretically from empirically relevant types of propositions, and they do include (which we do not) feedback from the outcomes of decision-making tasks.

Another type of modeling is that undertaken by Hermann (1963) in his analysis of the effects of crisis on administrative viability. In our model administrative viability would be an intervening variable, between crisis and the decision-making process. Thus Hermann's model is an elaboration of that part of our model which relates the stimuli of crisis conditions to variations in group behaviors (Proposition Set F).

The Applicability of Psychological Research to Governmental Decision-Making

One of the central questions of a study of this type is the relevance of our findings for crisis decision-making in international relations, presumably by variously composed groups of persons responsible for such matters in the U. S. government. One side of this question is

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[2]Charles F. Hermann, *International Crises: Findings from Behavioral Research* (New York: Free Press, 1972).

[3]Barry E. Collins and Harold Guetzkow, *A Social Psychology of Group Processes for Decision-Making* (New York: John Wiley and Sons, 1964).

essentially substantive and situational and we can answer this only by saying that in searching the literature we have looked for findings that dealt with crisis and stress reaction behaviors, or with problem-solving behaviors under stress, or the decision-making behaviors, stressed or unstressed, on the part of individuals and groups, whether such findings were reported from experimental work or systematic analysis of real world data.

The other side of the question involves the applicability of findings from experimental to real world situations and this is the thorniest side. It will be referred to from time to time in the ensuing text where it appears to be particularly prominent as a problem in the interpretation of given sets of findings. Here we discuss the question in general terms as being more or less at issue throughout the entire analysis of findings.

Essentially, the issue revolves around the relative similarity or dissimilarity of social science studies and real-world situations. Two related questions arise, one centering on the type of setting for an investigation and the other on the type of independent and dependent variables used. Can problem-solving tasks in a laboratory situation be equated with decision-making tasks in the real-world management of foreign policy crises? Can stress, artificially and deliberately introduced into a laboratory situation be equated with the stress of a foreign policy crisis? The following discussion focuses in a general way on this issue. In Phase II of this project, a more systematic evaluation of specific propositions was undertaken in order to judge the transferability of our findings from the literature.

Generally there are three types of settings from which data is collected in an investigation, each associated with a different degree of transferability of findings. Because a great deal of the literature we have surveyed is from psychology and social psychology, many of the studies are carefully controlled experiments in laboratory situations. In many of these the subjects are students and the tasks range from solution of electrical circuit problems to choice of bets in a card-playing exercise to complex choices among alternatives. In large part these laboratory experiments are the most "artificial" environments for studies of crisis decision-making. At an intermediate level of "reality" are simulations of decision-making situations. In these analyses, the subjects are more often actual decision-makers and

the tasks they must undertake are those they face in the work that they do. The simulation is designed to represent key aspects of the actual decision-making process. But data derived from these studies must be considered as being of an intermediate range of validity, the degree depending on how accurately the simulation reflects real-world decision-making and on the extent to which behavior is not affected by the subject's knowledge that he is participating in an experiment. At the highest levels of validity are those studies that are based on "real-world" data—data derived from some kind of measurement of actual decision-making behaviors. Here the validity problem is not one of the setting in which behavior is observed, but focuses on problems associated with collecting the data for the analysis.

Turning to the other question in this issue of transferability—that of the similarity of independent and dependent variables—we are faced with what is actually a problem of valid measurement that cuts across all three investigative settings. A specific example will best illuminate the dilemma. Let us take a close look at a piece of research which is a typical representative of the kind of analysis performed by psychologists and the limitations of that research in terms of applicability to foreign policy decision-making. It is a study of risk-taking behavior by Lieblich (1968).

Two groups of twenty-five students each participated in an experiment having three experimental conditions: a neutral condition, a relevant stress condition, and an irrelevant stress condition. The neutral condition was the non-stress condition, the "control" condition. Relevant stress was defined as a stress condition which the subject perceives as depending on his task performance; that is, he believes he can reduce the stress as a result of his behavior. Irrelevant stress was defined as a stress condition in which the subject believes the amount of stress is fixed *a priori* and is not subject to his behavior. Both types of stress were induced by administering electric shock to the subject. For relevant stress, the subject was told that there was a pattern which, if he could discover it, would reduce shock. For irrelevant stress, the subject was told that shock would come at random and not be affected by his problem-solving behavior.

The dependent variable, tendency to choose a risky alternative, is operationalized in terms of what bets the subject chooses to place in a playing card betting exercise. The subject is given a number of alternative bets that vary in the probability of success and their payoff; the lower the probability of success, the higher the payoff. Note the important fact, common to most psychological research, that all of the alternatives are known by the subject, and their consequences (probability and payoff) are also known.

This is the important information we have to consider in evaluating the research. The method of conducting the experiment need not concern us. Suffice it to say that each subject makes a series of bets in the non-stress, relevant stress, and irrelevant stress conditions.

The question, of course, is: How relevant is a finding, based on these experimental conditions, to crisis decision-making? The independent variable side of the experiment may at first be seen as completely irrelevant. What connection could there be between stress induced by electric shock and stress induced by a foreign policy crisis? There is none, if we consider only the stimulus of the stress—electric shock vs. crisis. But if, as Selye (1956) argues, we consider stress as a non-specific psychological and physiological state aroused by a stimulus then the exact nature of the external stimulus matters less. What is important is what happens to the individual psychologically and physiologically, and these reactions may be the same regardless of whether they are induced by electric shock or by the necessity of responding to a crisis situation.

The operationalization of the independent variable may be less of a problem than the operationalization of the dependent variable. Here there is a fundamental conceptual difference in the nature of the choice. In the betting experiment, the choice is made among alternatives which are all known and their consequences are specified. This kind of task may be called "problem-solving" as differentiated from "decision-making," which is a task requiring both a search for alternative choices and an estimation of the consequences of those alternatives. It is this difference that limits the relevance of psychological research to foreign policy crises.

Of what use, then, is a finding such as this one between stress and risk-taking behavior? For one thing, the finding may be applicable to crisis management. It is an empirical question that can be answered with research on foreign policy decision-making, perhaps through a simulation that operationalizes risk-taking in a crisis atmosphere. At least the psychological literature has alerted us to the possibility of this effect of stress, and gives us an expectation that this problem might be important in decision-making. For another the research tells us that a person's tendency to take risks is not an invariable factor, and we can begin to make judgments on the desirability of different degrees of risk-taking. That is, a tendency toward choosing alternatives of higher risk may be judged by some people, or in some circumstances, as desirable, while it may be judged by others, or in other circumstances, as undesirable.

Credibility of the Findings

How well founded the propositions are depends upon the nature of the scientific findings, or evidence, marshalled in their support and this in turn depends on four factors: (1) the reliability of the individual pieces of scientifically conducted research that support the findings, (2) the validity of the findings in terms of their actually measuring the relationships stated in the propositions, (3) the weight of the evidence in terms of the numbers of independent studies which support the same proposition, and (4) the degree of consistency among related findings.

The first two of these factors have been used as criteria for the selection of materials in our literature search. That is, we have looked for materials which appeared to be the most reliable and valid. By sorting these out into a matrix of dependent and independent variables and analyzing the findings in each cell, we were able to gain a first glimpse of the second two factors. As more findings are added to the existing evidence, it may be possible to make more definitive judgments about the weight and consistency of the evidence as well as about weaknesses and gaps. For example, some propositions are supported by only one piece of research, and clearly need further study. However, others are supported with

both experimental and "real-world" data; these can be considered reasonably well-established pieces of knowledge, and might form the basis for policy recommendations for crisis management. This will set the stage for a more rigorous evaluation of the reliability and validity of the evidence aggregated for each proposition.

Evaluation of the existing evidence was conducted in Phase II of this study and it was also in the second phase that we were concerned with evaluating the propositions themselves in terms of their relative importance in real world crisis decision-making situations. The results of this evaluation are presented in Part III.

Implications of the Findings

An issue which is continuously of concern in a study of this sort is the relevance of the findings for policy making and the management of decision-making under crisis. The model which we have developed here organizes what we know and want to know about the psychological and sociological process involved, but it does not translate immediately into a model of all of the various things that a manager must consider, and all the things that a manager may or may not, must or must not, do under the circumstances. For the "knowledge model" and its respective findings to be useful, a policy and management model needs to be developed and the translation from the former to the latter made by thinking out and checking the logical implications of knowledge for the kinds of questions managers necessarily raise.

It is not one of the major purposes of this project to draw the implications of our survey of the literature for the crisis management activities of decision-makers. However, we have had to keep attuned to these implications primarily for the reason that there is a reflexive aspect to management type questions and operational models. That is, the questions and issues raised by crisis management implications have a great deal to say about the kinds of findings we should be looking for at the outset, the kinds of propositions that are relevant from an operational as well as a theoretical point of view. Some of the more important policy implications that have both guided our research and emerged from it are discussed in the final chapter of this report.

CRISIS MANAGEMENT:

PSYCHOLOGICAL AND SOCIOLOGICAL FACTORS IN DECISION MAKING

CHAPTER 2

THE EFFECTS OF STRESS ON COGNITIVE, PERCEPTUAL, AND AFFECTIVE BEHAVIORS

Section A. Cognitive Processes

While what has been called the "rational model" of decision-making may not adequately account for the operation of the policy process, nevertheless an important component of the process is the application of intellectual capabilities to analyzing a decision situation and deciding upon a response. Individuals make decisions, not "nations," and thus decisions are the product, at least in part, of the intellectual capabilities of decision-makers. In a non-normal situation—a crisis—the functioning of intellectual processes may be displaced from their normal parameters. This section examines how the stress induced by a crisis affects the intellectual processes of decision-makers, here grouped under the label "cognitive processes."

Proposition 1. The greater the stress, the greater the conceptual rigidity of an individual.

The human being is similar to a computer; that is, at any one time, he consists of a set of equations, albeit complex ones with factors that would be impossible to program into a machine. which process incoming information and produce a response. These equations are called conceptual sets. As in the computer, the equations are designed to meet only certain kinds of situations. Faced with a new situation, new equations must be constructed in order to adequately respond to the new information. What happens in a situation of stress is that these conceptual sets, which include an individual's values, become rigid in the face of incompatible cues from the environment (Moffitt and Stagner, 1956:355). New conceptual sets are not created to handle the new situation. Rather, a previously dominant goals-means value complex persists and guides responses (Paige, 1972:49; Postman and Bruner, 1948:322), even

when those responses prove ineffective (Luchins, 1942). The dangerous effects of this conceptual rigidity are pointed out in the next two propositions.

Proposition 2. The greater the conceptual rigidity, the more closed to new information the individual becomes.

Because the incoming information of the crisis situation does not fit into the inflexible conceptual sets of the individual, he begins to "select out" this new information. What he becomes closed to is unpleasant information and information that does not support preferences, expectations, and stereotypes (Holsti, 1972a:15, 19). This further compounds the problem of conceptual rigidity, because the individual is not receiving information that will challenge his existing conceptual sets.

Proposition 3. The greater the conceptual rigidity, the greater the tendency to repeat prior responses, to the exclusion of new alternatives.

This finding has already been implied in the above discussion. It expresses the direct decision-making effect of conceptual rigidity. When an individual becomes inflexible in the conceptual sets he brings to bear in a situation, creativity in the consideration of alternatives is constrained and responses formulated for past decisions are adopted (Milburn, 1972:265). This is particularly true because in these stress situations there is a propensity to draw information from past experience (Paige, 1972:48).

Proposition 4. The greater the stress, the greater the loss in complexity of cognitive processes.

Here we deal with the basic intellectual functions of the individual as he processes information about his environment. One of the effects of stress is to inhibit what has been called the abstract ability of an individual. Beier (1951:18) experimentally showed the effects of stress on the components of abstract ability: a loss in the ability to categorize, a loss in the ability to shift from one concept to another, and a loss in the ability to sustain several tasks simultaneously and to synthesize them into a single action. Holsti and Milburn,

in their reviews of the experimental and non-experimental literature, support these findings. Holsti (1972a:13) states that under stress there is a loss of complexity in the dimension of political dimension, but he does not define this concept. Milburn (1972:275) observes that "thought processes which are overly simplistic and concrete (as opposed to abstract) tend to occur among individuals experiencing crisis, and lead to thinking about the outcome of the situation in zero-sum terms (either I-win-you-lose, or I-lose-you-win)."

The process of learning is another aspect of complexity of cognitive processes (Milburn, 1972:265). Stress seems to facilitate simple learning, such as classical defense conditioning. But it is more complex learning that is crucial in foreign policy decision-making. Stress is dysfunctional here. The more complex the type of learning (e.g., concept learning), the more likely it is that stress will disrupt the learning process. If stress is intense and it persists, it is likely that more recent and usually more complex learned behavior will disappear, and simpler, more basic forms of behavior reappear.

There are two shortcomings in the research. One of the problems, as we discussed in the introduction, is the "real-world" validity of the findings. To what extent do these breakdowns in complex cognitive processes occur in officials responsible for handling foreign policy crises? The other problem is that there is little research connecting these findings to the performance of decision-making tasks. That is, how does the loss in abstract ability affect the ability of the individual to carry out the various steps of a decision process?

Proposition 5. The greater the stress, the less the ability of the individual to tolerate ambiguity in the environment.

Related to the loss in the complexity of cognitive processes under stress is a loss in the ability of the individual to cope with an ambiguous environment. There is likely to be much more ambiguity in dynamic and complex environments than in static and simple environments (Duncan, 1972:324). A crisis, of course, is characterized by the dynamic and complex nature of the environment, resulting in ambiguity of information. As the stress increases in a crisis, the decision-maker is less able to tolerate this ambiguity (Smock, 1955:179-180). The important effect of this is expressed in the next finding.

Proposition 6. Intolerance of ambiguity leads to a response to a stimulus before adequate information is available for the correct response.

When an individual cannot tolerate the ambiguity of the information he is receiving he rushes to formulate a response and thereby bring closure to the situation (Smock, 1955:179). Once he has responded, he no longer has to deal with the ambiguous environment. The problem is that this response is made before adequate information is received that would adequately define the situation. The result is likely to be an incorrect response. One alleviating factor is the individual's experience with the ambiguous environment. Smock (1972:180) shows that a learning process from the first to the last trials in his experiment tends to increase the individual's tolerance for ambiguity.

Proposition 7. Under increasing stress there is a decrease in productive thought and an increase in non-productive thought.

This proposition supports the general thrust of the previous three hypotheses that stress leads to a breakdown in the cognitive processes of the individual. In observations of a small decision-making group, Lanzetta (1955:41) finds that as stress increases, there is less productive behavior from members such as "diagnosis of the situation," "interpretation," and "initiating" (creative) behavior and more non-productive behavior such as "general discussion of the task." That is, at precisely the time (a crisis) that creative thought is needed most, there is a breakdown in these thought processes.

Section B. Perceptual Processes

One of the major limitations on the ability of individuals to make effective decisions is the extent to which they can adequately perceive a complex environment. The only "reality" that exists for decision-makers is the reality that they perceive. In international relations, the problem of accurate perceptions is especially difficult due to information load, unclear signals, different cultural perspectives, interference from other environments (e.g., the domestic system), and so on. When decision-makers are subject to the stress of a crisis situation, these

problems are further compounded. This section presents a number of propositions on the consequences of crisis for adequate perception of the environment.

Proposition 8. The greater the stress, the greater the distortion in perceptions of the environment.

One of the earliest and most important studies of perception under stress was conducted by Postman and Bruner (1948). Their experiments show that under stress perceptual behavior is disrupted, is less well-controlled than under normal conditions. Premature interpretations of stimuli are made, the ability to select the correct percepts from a complex field is impaired, and sense is poorly differentiated from nonsense, leading to frequent nonsensical interpretations of the stimuli. In addition, the individual under stress is impaired in his ability to distinguish the dangerous from the trivial, thus leading to a distorted perception of what is important in a situation (Katchmar *et al.*, 1958:562). The significance of this in a foreign policy crisis is obvious.

Korchin (1962:21-22) presents a modification of this finding. His observation is that the relationship between stress and perceptual distortion is not linear but curvilinear. That is, as stress increases to moderate levels, the individual focuses his attention on relevant stimuli and his time perspective contracts to the present; perception becomes more accurate. Beyond a threshold, however, as stress increases to high levels, the individual becomes unable to focus on relevant information and perceptual accuracy breaks down.

Proposition 9. The greater the stress, the fewer the number of elements in the environment that are perceived.

Not only will the perceptions of the environment be distorted in a crisis situation, but also the total number of elements perceived will be smaller. There are two aspects of this problem. One is simply that the number of stimuli of which an individual is aware becomes smaller (Milburn, 1972:265). The other is that within a class of stimuli, the individual will fail to perceive variations (Smock, 1955:179-180). That is, the individual might perceive a number of events as the same where in fact there are important differences among those events.

Proposition 10. The greater the stress, the more distorted the perception of time.

This is one of the most significant, as well as one of the most substantiated, propositions of the perceptual literature. A crisis is, by definition, a situation of short decision time. There is strong pressure to make a quick response. As if this were not problem enough, what happens is that in a stressful situation the decision-maker's perceptions of time are distorted in the direction that aggravates time pressure. That is, decision-makers tend to overestimate the amount of time that has passed in a crisis.

This proposition has been supported in experiments by Cohen and Mezey (1961: 266-268) and by Langer, Wapner, and Werner (1961:96), and in a general review of the literature by Milburn (1972:274). In addition, the finding is also supported by a "real world" study of emergency medical services conducted by Williams and Rayner (1956:661).

Thus time pressure becomes a highly salient factor in the crisis decision-making process (Holsti, 1972a:14). A circular process arises: because of the surprise and threat of a crisis, as well as the use of such techniques as ultimata, there is great time pressure that leads to stress. This stress, in turn, causes distortions in the perceptions of the passage of time, in an overestimated direction, thus further heightening the time pressure.

Proposition 11. The greater the stress, the greater the amount of risk perceived in the environment.

Nebeker defines stress in a different way from most of the studies we have surveyed. Actually, he does not use the term stress at all, but instead talks about the favorability of the situation. Conceptually, his operationalization of situational favorability seems to be a good way of defining stress. The favorability of the situation is defined in terms of three components. *Leader-member relations* is an indicator of how well the leader and his subordinates get along. *Task structure* is an indicator of how well defined and clear is the task and its method of accomplishment. *Position power* is an indicator of how much power is available to the leader over his subordinates.

Nebeker's (1974:7, 10) study shows that under stress caused by an unfavorable decision situation (leader-member conflict, poorly defined and ambiguous task and performance criteria, limited position power), decision-makers tend to perceive a greater amount of risk in terms of the probability of failure and the negative utility of failure. Thus under stress, decision-makers are likely to exaggerate the amount of risk they must respond to, and the probability is that their responses will be inappropriate.

This relationship between stress and risk perception may be modified, however, by the amount of time spent on the task, as the next proposition points out.

Proposition 12. The greater the amount of time spent on a task, the lower the amount of risk perceived in the environment.

A tendency to perceive greater amount of risk in a stressful situation may be alleviated by the amount of time a decision-maker spends dealing with the problem. In a Tactical Negotiations Game, which simulates decision-making in a war situation, subjects rated the amount of risk they perceived in the environment on a scale of one to seven. At the same time the objective level of risk, which was measured by the number of men committed to a position in which there was a probability of loss, was held constant. Over time, that is from the first to the last of five trials, the amount of risk perceived by the subjects, as rated on the seven-point scale, decreased significantly, while the objective level of risk stayed the same (Streufert and Taylor, 1971:15).

Proposition 13. In a crisis situation, decision-makers do not perceive differences in the target of threats; they do not distinguish between threats to oneself, threats to the organization, and threats to the nation.

Using questionnaires and interviews, Lentner (1972:308) studied the behavior of decision-makers in the crisis Operations Center of the Department of State. His data base was derived from 42 interviews and 79 responses to a 50-item questionnaire by mid-level Foreign Service Officers. One important conclusion from his study is that officials do not perceive differences between self, organization, and nation in terms of the target of a

threat. That is, when an event is perceived, officials do not differentiate whether the event threatens the goals of the person, the organization, or the nation.

The implication of this finding is that the response to the threat may be inappropriate. An event that is perceived as a threat to the State Department may not be as important a threat to the nation. To formulate national decisions on the basis of this inaccurate perception may lead to serious consequences. One question that the study raises, then, but does not answer because it examines only the one case of the State Department, is: Do the members of all organizations behave this way? If some do and some do not, then this gives us a prescription as to which organizations should be given the responsibility of handling foreign policy crises. For example, if State Department officials fail to make these distinctions but members of an NSC agency do make the distinctions, then the latter organization should handle the crisis. Thus the question becomes important in the crisis management stage of deciding which group is tasked with managing the crisis.

Section C. Affective Factors

Obviously, one of the major reasons why a rational model of the policy process does not provide an adequate explanation is that various affective factors influence the behavior of an individual. These operate in all types of decision-making, but we can reasonably expect that in the high pressure situation created by the threat and short decision time of a crisis, various affective reactions may be an important factor in accounting for decision output.

There is some debate about the value of taking these non-rational variables into consideration. The question is: Does the increase in explanatory power contributed by the inclusion of non-rational variables in a model outweigh the cost of including them? This is a question raised by Sidney Verba in a well-known article.[1] In an analysis that is impressionistic rather than systematic, Verba concludes that the nature of foreign policy decision-making, as opposed to domestic policy decision-making, is such that the operation of non-rational

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[1]Sidney Verba, "Assumptions of Rationality and Non-Rationality in Models of the International System." In Klaus Knorr and Sidney Verba (eds.), *The International System: Theoretical Essays* (Princeton, N. J.: Princeton University Press, 1961), pp. 93-117.

variables is inhibited. That is, they do not explain much of the variance in decision-making, so may be left out of an explanatory model.

We judge this to be an empirical question, however. As mentioned above, Verba's analysis is not based on any systematic evidence. The article raises important questions, but does not answer them. In the absence of contradictory evidence, then, we consider it the better part of scholarly discretion to assume that affective factors are important in crisis decision-making. With this in mind, we have examined the literature that looks at the effects of crisis on affective variables.

Proposition 14. The higher the intensity of the threat and the shorter the decision time available to cope with it, the greater the negative affect.

Margaret Hermann (1966:390) uses negative affect as a collective term for the emotional states of anxiety, fear, frustration, hostility, and tension. Her data was derived from eleven runs of the Inter-Nation Simulation of international politics, using 163 Navy petty officers playing the roles of national decision-makers. The analysis indicates that in a crisis situation, psychological factors do indeed become important. The subjects did not remain "cool;" rather, they expressed the various manifestations of negative affect—anxiety, fear, and so on.

The important follow-up question, of course, centers on the effect of the aroused anxiety, fear, frustration, hostility, and tension. There are two possible effects, expressed in the next two propositions.

Proposition 15. The greater the negative affect aroused by a crisis, the greater the decision-maker's attempts to cope with it.

Hermann's research using the Inter-Nation Simulation gets at the positive effects of these psychological variables. She finds that negative affect, as defined above, spurs the subject to action designed to reduce the threat in the crisis situation (Hermann, 1966:390). In the simulation, subjects experiencing negative affect showed greater participation in activities that would cope with the threat such as writing messages to, and holding conferences with, other players in the simulation.

Proposition 16. The greater the fear, frustration, and hostility aroused by a crisis, the greater the tendency to aggression and escape behaviors.

Here we have a statement about the negative effects of crisis-related psychological variables. Both aggressive behavior and escape behavior are manifestations of avoidance of a task. They represent a more primitive level of function than is usually observed in the absence of frustration. They are, of course, maladaptive responses. They interfere with perceptual processes, that is, with the ability to select the relevant percepts from the environment and order them in a coherent image. Both of these maladaptive responses have been found to increase in individuals subject to stress (Postman and Bruner, 1948:322; Miller, 1941:338).

Proposition 17. In a crisis situation, negative psychological factors are reinforced.

This proposition presents another negative result of crisis-induced stress. Faced with stress, psychological problems of an individual may be aggravated. For example, Milburn (1972:265) observes that in a crisis, "repressors" tend to repress more. He also notes that the anxiety expressed by anxious prone individuals tends to increase in a crisis. This anxiety is manifested in various ways. The immediate symptoms are irritability, confusion, feelings of unreality, and post-traumatic amnesia (Shaffer, 1947:143). After-effects include fatigue, restlessness, depression, overreaction to sounds, loss of appetite, fearful dreams, obsessive thoughts, tremors, and tics (Shaffer, 1947:143). Obviously this research was concerned with psychological patients and not with decision-makers; symptoms such as fearful dreams, tics, and so on are not relevant to crisis management. But other symptoms, such as depression, confusion, and feelings of unreality could be highly significant. Research is needed on the extent to which these symptoms of anxiety play a role in the psychological reactions of decision-makers to stress.

Proposition 18. There are no consistent significant relationships between three kinds of threat and four dimensions of psychological response to threat.

The research does not all agree that stress has negative effects on psychological variables. At least one study shows no relationship. Cattell and Scheier (1960:201) analyzed 72 measures of psychological response to threat; the factor analysis produced four dimensions of threat response—Anxiety, Neurotic Debility, Stress, and Frustrative Depression. None of the three different kinds of threats in the experiment proved to be consistently related to any of these dimensions. There was not even consistency in the direction (positive or negative) of the relationship.

The problem, of course, in these contradictory findings is that the studies are not comparable. At a conceptual level they may be comparable—e.g., threat response is the dependent variable. The operationalizations of threat response are so different, however, that it becomes impossible to make any kind of evaluation. Propositions 16 and 17 may be valid findings, and the contradictory Proposition 18 may be of equal validity. One has to accept them at the level of the measures used and not attempt to make any more generalizable statement at this time.

Proposition 19. The greater the stress, the greater the fatigue, and fatigue in turn leads to more stress.

Fatigue is not really a psychological variable, although it definitely has psychological manifestations. It is included here only because it seems closer to psychological factors than to the factors considered in the other three sections of this chapter.

Analysts generally seem to agree that there is an inter-dependent relationship between stress and fatigue (Holsti, 1972a:10; Robinson, 1972:304; Milburn, 1972:260, 265). This is not a particularly earth-shattering conclusion. Nevertheless, it is an important factor to consider in crisis management, as it may have serious effects on the performance of various decision-making tasks.

CHAPTER 3

THE EFFECTS OF STRESS ON DECISION-MAKING PERFORMANCE

In this chapter we consider the effects of crisis-induced stress on the individual's performance of various decision-making tasks. This set of propositions is probably the most directly relevant to crisis management, in that the link from environmental input (stress) is related directly to the output behavior of crisis managers.

It would be well to mention briefly a caveat discussed in the introduction to this report. Most of the measures of decision-making performance, in general or in specific tasks of decision-making, are derived from the laboratory experiments of psychologists and other social scientists. There is often a basic difference between the activities given these experimental subjects to perform and the activities that confront decision-makers. The former are often faced with a *problem-solving* task—one in which the choices are known and the consequences are known. The task consists of choosing a determinable "correct" decision. In the policy process, on the other hand, foreign policy crisis managers are faced with a *decision-making* task—one in which the alternatives are not all known and there is difficulty estimating the consequences. There is no "correct" choice. This crucial difference must be kept in mind as one surveys the findings of social scientists. While it certainly does not negate the validity of the research we have reviewed, it does put certain limits on its relevance that must be considered.

Decision-making consists of a number of discrete tasks, sometimes performed sequentially and sometimes not. This section groups findings according to a rough "rational decision-making" model. The policy-makers must first choose a goal, then search for and analyze alternatives, and then choose an alternative that is expected to achieve, at least partly, the chosen goal. It is in this order that the findings will be presented.

Proposition 20. In a stressful situation, the only goals that will be considered are those relating to the immediate present, at the sacrifice of longer range considerations.

There is virtually no research on the problem of choosing goals in either normal decision-making or decision-making under stress. No doubt this is true because the concept is difficult to define and difficult to measure. One problem, of course, is level of generality. "National security" is a goal, but it is expressed at such a general level that it becomes useless in accounting for policy choices. If goals are considered to be important elements in explanatory models of decision choices, then here is one of the major gaps in the literature.

The hypothesis above is stated at an exceptionally general level, so that it gives us no more than a clue about what kind of goals will be considered in a crisis situation. The finding is supported by both experimental research (Albers, 1966:4848) and field research (Thompson and Hawkes, 1962:283). What this finding suggests is that there could be a position, somewhat insulated from the stress of the situation, whose task it was not to solve the crisis situation but to check the policies of the crisis group against long-range goals.

Proposition 21. As a crisis continues and the amount of time decision-makers are under pressure to solve the problem increases, there will be significant changes in goals.

Here again we have only a very general statement on the choice of goals. But this does tell us something about the process of goal choice, and alerts us to an effect of stress that may have important consequences. Goal change can often be an unconscious or semi-conscious act that is in response to failure. It may be dysfunctional, providing the policy maker a rationale for continuing a response after that response has ceased to be beneficial. Holsti (1972a:16) cites an experiment (Deutsch and Krauss, 1960:189) in which the subjects, faced with repeated failure, continued their responses, changing their goals from one of success to one embodied in the statement that "if I'm going to lose, at least I'll pull the other player down with me." He also notes a quotation of Kaiser Wilhelm that expresses the same change of goal to justify continuing a behavior pattern, in this case activities leading to war: "If we are to be bled to death, England shall at least lose India."

Paige (1972:52) backs up this evidence with his analysis of the Cuban missile crisis. The proposition drawn from his work is that "as decision time increases, shifts in the value bases designed to legitimate the crisis responses will tend to occur."

Proposition 22. The greater the stress, the greater the tendency to make a premature choice of alternatives before adequate information is available for a correct response.

There has been a good deal of research on various aspects of the process of choosing alternatives. One of the things that we know is that in a stressful situation, the decision-maker feels pressured to come to a decision quickly (Smock, 1955:179). He makes his choice before adequate information is available, and therefore there is a greater likelihood that his response will be incorrect.

An important implication of this proposition is that "decision time," or the time available in which to make a response, is not necessarily an objective or determined aspect of the situation. In some situations, an ultimatum with a deadline attached to it will specify the amount of time available for decision-making. But in other situations, time pressure may be at least partly a perceptual factor, dependent on the individual's reactions to the stress of the crisis. The greater the stress, the greater the tendency for the individual to feel pressured to make a decision and thus the more likely a premature, incorrect response will be made (Robinson, 1972:304).

This finding suggests that it is often useful to postpone making a choice of alternatives as long as possible. If the time available in which to make a decision is partly a controllable factor, then procedures could be adopted which would check this tendency to make a premature choice.

Proposition 23. In a crisis situation, decision-makers become too pressured to discriminate between alternatives.

Related to the time pressure of crisis decision-making and the tendency to make premature choices is the quality of the analysis of alternatives. Before making a choice, to

what extent does the decision-maker consider the options for response? Hermann's (1972b: 199) simulation of foreign policy-making suggests that analysis becomes crude in a crisis situation. That is, important differences among alternatives are glossed over, so that only a few distinctions are made.

There is some justification for not discriminating between alternatives. That is, Hermann's finding is not necessarily a negative result of crisis decision-making. Given the time pressure and limited resources, it may be rational for the decision-maker to start putting alternatives into gross categories so that he can reduce the number he has to consider. That is, the sacrifice of distinctions among alternatives may be helpful in responding quickly to a crisis situation. Nevertheless, it remains that the analysis becomes limited. The problem of analysis is further complicated by the limitation contained in the next finding.

Proposition 24. The greater the stress, the more restricted is the ability to estimate the range of possible consequences of a particular policy alternative.

From his analysis of the literature, Holsti (1972a:15) concludes that one of the major tasks of decision-making is impaired in a crisis situation. There is a breakdown in the individual's ability to predict the consequences of the alternatives under consideration. This is due in part to the fact that, as we shall see, creative thinking in general is impaired under stress. It is also due in part to the fact that crisis leads to a predominant concern for the present and immediate future at the sacrifice of attention to longer-range considerations (Albers, 1966:4848; Thompson and Hawkes, 1962:283).

The nature of the crisis situation compounds this problem of estimating consequences. Crises are characterized by a complex and uncertain environment. This makes the *difficulty* of estimating consequences greater, even for individuals operating in a non-stress environment. At the same time, crisis involves a high degree of danger; in such cases the *need* for accurate prediction of consequences is greater than usual. Thus the nature of the problem that decision-makers have to face: at a time when the difficulty of estimating consequences is heightened and a

time when the need for accurately estimated consequences is high, the ability of the decision-maker subject to stress to perform this task is impaired.

We have looked at several propositions that relate to how a decision-maker chooses alternatives. Now we turn to research that attempts to account for what kind of alternatives will be chosen by an individual subject to stress.

Proposition 25. The greater the stress, the greater the likelihood that a decision-maker will choose a risky alternative.

There has been a great deal of psychological research on the tendency of individuals and groups to take risks. This is only the first of a number of propositions that will appear throughout the report on this topic.

Risk taking is an important part of crisis decision-making, insofar as the environment is uncertain and there is difficulty in estimating the consequences of actions. Most likely, any foreign policy act involves risk. However, there can be degrees of risk attached to different alternatives, so it becomes important to study a decision-maker's tendency to choose a risky alternative.

Lieblich (1968:304) finds that under stress, the average degree of "riskiness" of alternatives chosen by individuals is higher, and the variance lower, than it is in a non-stress condition. However, contrary to expectations, she finds that stress which is relevant to the decision-making situation is no more motivating than stress which is irrelevant. That is, stress seems to be non-specific; relevant stress does not produce a higher degree of risk-taking than irrelevant stress. This aside, however, Lieblich's main finding is that in a crisis situation, decision-makers are more prone to choose risky alternatives.

Proposition 26. There is a curvilinear relationship between stress and performance: as stress increases to moderate levels, performance improves; beyond moderate levels, stress leads to poor or incorrect choice of alternatives.

There seems to be pretty good consensus among scholars that the relationship between stress and measures of general decision performance is curvilinear. Stress is considered a motivating factor. At low levels of stress, there is low motivation, and decision performance is consequently poor (Milburn, 1972:264; Levine, 1971:26-31; Korchin, 1962:21; and Back, 1961:14-19). As stress reaches moderate levels, these studies indicate that performance in making a correct choice of alternatives reaches an optimum. There is not total agreement, however. At least one study (Ray, 1965; 228, 231) finds that even mild stress, brought about either by frustration due to failure or by personal responsibility for correcting errors, leads to a breakdown in decision performance. The contradiction can in part be attributed to a lack of agreement on what constitutes low, moderate, and high levels of stress.

The studies further agree that as stress reaches high levels, the individual has a much higher tendency to make poor or incorrect choices of alternatives. This is so because the very abilities that are most crucial to decision-making in crisis situations suffer the most under stress. That is, intense stress leads to a breakdown in the qualitative or creative aspects of performance, as opposed to the quantitative or repetitive (Lowe, 1961:303-308; Kiesler, 1966:227-235). Milburn (1972:264) concludes that "in a situation of very intense stress, complete disintegration of performance tends to occur."

Proposition 27. The greater the time pressure, the poorer or more incorrect the choice of alternatives.

Essentially this proposition is a component of the previous one, because in our definition, time pressure is conceived to be one of the elements of crisis-induced stress. Nevertheless, we thought it worthwhile to break out a separate hypothesis, both because there was research on the subject and because time pressure is an important variable. There could be a significant difference between two crises if the time pressure was different in the two situations.

Usdansky and Chapman (1960:145) find that under time pressure, the decision-making choices of subjects become schizophrenic-like. That is, under time pressure, subjects show an increase in the number of associative errors in a word choice task. This error measure has been found to be an indication that distinguishes schizophrenic from normal individuals. Their research is backed up by a study by Williams (1957:15-19), and, as we shall see in a later chapter, on a group level by Pepinsky, *et al.* (1960:34-38).

One can increase the time pressure of a crisis situation by shortening the amount of time available in which to make a decision. This is the approach of Usdansky and Chapman. However, time pressure can also be increased by increasing the number of decisions that have to be made, while holding constant the available time. The results, however, are the same. Mackworth and Mackworth (1958) show that when time pressure is increased by increasing the number of decisions to be made by a factor of five, the number of errors in performing a decision-making task increases by a factor of fifteen

CHAPTER 4

THE EFFECTS OF PERSONALITY CHARACTERISTICS OF THE DECISION-MAKER ON DECISION-MAKING PERFORMANCE

There are some individual-level factors that are important determinants of behavior but are not dependent on a crisis situation. These are personality traits and other factors associated with the individual. The values of these variables do not vary from a non-crisis to a crisis situation. Unlike stress, which takes on a new value in a crisis, variables such as the decision-maker's experience or the degree to which he exhibits an authoritarian personality do not vary when the individual moves from a non-crisis situation to a crisis. Such factors are, however, important determinants of the individual's behavior in crisis decision-making, and so they should be taken into account.

Our review of this kind of literature is meant to be suggestive rather than exhaustive. The main purpose of our literature review was to abstract findings on decision-making under stress. In the process we identified some literature that shows the effect of variables that are independent of crisis on decision-making. These findings are a secondary product of our project. That does not make them less important, however. To fully account for crisis decision-making, one must examine independent variables that function only in crisis (e.g., stress) and also independent variables that function in any kind of decision-making (e.g., authoritarianism).

Proposition 28. The more motivated individuals are to achieve a goal, the more likely they are to perceive the goal as threatened when potentially threatening stimuli are directed toward it.

In the previous chapter, we considered various tasks of the decision-making process as the dependent variable. One of the crucial tasks which we did not consider, because there is no research that we know of in the area, is the task of diagnosing that a crisis exists. This is, of course, a first step that occurs before any of the other stages in the

decision-making of crisis management. Essentially, the question is: When will an event (stimulus) in the environment be interpreted by participants as a threat to their goals? That is, when is an event considered to be a crisis?

There is only one piece of research on this question, and it is embodied in this proposition. In eleven runs of the Inter-Nation Simulation of international politics, Margaret Hermann (1966:383) defines motivation to achieve a goal as the importance of a goal to the nation, rated by the subjects on a twenty-point scale from "unimportant" to "important." She finds that when there is high motivation, a stimulus in the environment is more likely to be perceived as a threat to the goal than when there is low motivation. More research on this subject is necessary with other relevant independent variables, particularly stress. We want to know whether there is a greater tendency to perceive a stimulus as threatening when the individual is subject to stress than when he is not.

Proposition 29. There is a relationship between the amount of experience a decision-maker has and his mode of processing information about a decision.

Once a decision-maker has decided that there is a crisis, he begins to process incoming information about the crisis so he can make his decision. This and the following proposition concern the effects of personality characteristics on this variable.

Taylor (1972) has conducted a simulation of a business decision in which several measures of a decision-maker's experience, in addition to two personality traits which we will examine in later hypotheses, are correlated with aspects of information processing and decision-making behaviors. The simulation, which was played in his experiment by seventy-nine subjects, systematically observes and objectively measures these information processing and decision-making behaviors. In this hypothesis, only the information processing behaviors are considered. Taylor's findings are important ones. They are, however, the only research we have on these several variables.

Taylor (1972:443) finds that the older a decision-maker, the more information he tends to acquire in making a decision. The greater the number of employees supervised

by a decision-maker, the better is his short-term memory for information items. The older a decision-maker and the more supervisory experience he has, the more his information-processing strategy will emphasize careful and accurate ratings of item importance values and the less his strategy will emphasize retention of the content of the items. Finally, the greater the percentage of time spent by an individual in supervising the activities of others, the less he tends to retain information after declaring a decision.

Proposition 30. The more prone a decision-maker is to take risks, the less information will be used by him in decision-making.

In the same simulation, Taylor measured the proneness of an individual to take risks with an instrument that requires the subject to estimate the probabilities of success in a number of choice dilemmas. He finds that there is a negative correlation between this variable and the amount of information the subject requests in making his decision.

This is probably an expectable finding. One would think that a person prone to take risks would use less information in his decision-making. The two variables, in fact, are somewhat synonymous. If one is taking a risk, what is he doing other than making a decision on a smaller amount of information than usual? There are important policy implications, however. These individuals who are prone to higher degrees of risk-taking may not be desirable participants in the decision-making process in that they tend to base their decisions on limited amounts of information. In situations like a crisis in which there is inadequate information in any case, a tendency to further limit the amount of information used may lead to inaccurate decision-making.

Proposition 31. The more prone a decision-maker is to take risks, the more rapidly will he make decisions.

This also is perhaps an expectable proposition, particularly in light of the previous hypothesis indicating that risk-prone individuals use less information in their decision-making and therefore could be expected to use less time. The finding is from the same simulation (Taylor, 1972:444).

The implication of this finding is not necessarily a negative one. That is, a rapid response rate can be judged an advantage or a liability, depending on one's perspective. If one sees it as a measure of productivity, and assumes the position that in a crisis, decisions must be made rapidly and frequently, then one would value the high response rate. If one sees it as an indication that decisions are being made before adequate information is available for an accurate response, then one would discourage the high response rate and consider excluding the risk-prone individuals from participation in decision-making.

Proposition 32. The greater the supervisory experience of a decision-maker, the more rapidly will he make decisions. This tendency is modified, however, by increasing age of the decision-maker.

In addition to risk-proneness, several other characteristics of the decision-maker have been correlated with response rate, as this and the next two findings point out. Once again it should be emphasized that these findings do not have value implications. Response rate is just that: the speed with which the decision-makers make decisions.

Taylor (1972:443), in his simulation, finds that the greater the decision-maker's experience, in terms of number of employees supervised, the more rapidly he tends to make decisions. However, as a decision-maker gets older, he tends to take more time in making decisions.

Proposition 33. The more dogmatic an individual, the more rapid is his decision-making.

Taylor (1972:444) defines dogmatism as the degree to which an individual's value system is "open" or "closed," and develops a scale to measure this variable. He finds a positive relationship between dogmatism and a decision-maker's response rate. This is readily understandable in light of the finding reported in Proposition 2, which was that the greater the conceptual rigidity of a person, the more closed to new information he becomes. If a person with a "closed" value system tends to acquire smaller amounts of information, and therefore does not need to spend time processing that information, then it is likely that he will be able to make decisions quickly in a crisis situation.

Proposition 34. Individuals using the goal-oriented mode of coping with anxiety make decisions more rapidly under stress than prior to the induction of stress, whereas individuals using the ego-oriented mode of coping with anxiety show no such increase.

In this proposition we deal with a personality variable that is more closely connected with the psychological make-up of the individual than some of the other characteristics. This variable, the mode of coping with anxiety, is seen as an intervening factor that mediates the effects of stress on decision-making performance. That is, the author is trying to posit a psychological mechanism through which a stressful stimulus acts on the output behavior of an individual.

The stressful stimulus arouses anxiety in the individual. The assumption is that the individual's mode of coping with that anxiety will determine his decision behavior. There are two methods of coping with anxiety. In the "goal-oriented" mode, continued pursuit of the blocked goal is the path chosen for the reduction of anxiety. In the "ego-oriented" mode, withdrawal from the stressful situation is instrumental in reducing anxiety. An experiment shows that in a stressful situation, those individuals who use a goal-oriented method of coping with anxiety make decisions more rapidly than in a non-stress situation (Lowe, 1961:303). For individuals in the ego-oriented mode, there is no such increase from non-stress to stress.

Proposition 35. Decision-makers who perceive themselves as having control over their environment are less likely to choose risky alternatives.

Moving to explanations of what kind of decisions will be made, we find only a small amount of research. One important independent variable in terms of what kind of decision-makers are involved in crisis management is embodied in this proposition.

Higbee and Streufert (1969) have studied this proposition using their Tactical and Negotiations Game, in which subjects make decisions in a simulated small-scale international conflict with some Vietnam characteristics. If the subject indicated that the situation which faced him was due to decisions his team made, then he was scored as perceiving himself to have control over his environment. If he indicated that the situation was due to decisions made by the enemy team, "various chance factors," "characteristics of the environment," or

"arbitrary decisions made by the experimenters," then he was scored as perceiving himself not in control of the environment. The experiment indicates that decision-makers who perceive themselves in control of the environment tend to make choices of less risky alternatives (Higbee and Streufert, 1969:106).

Similar, but more detailed, findings are reported by Liverant and Scodel (1960: 63-64). Their experiment is more limited, however, in that they use a card betting exercise to measure risk-taking behavior rather than a simulation of an international environment. Also, the independent variable is slightly different, although similar enough so that it seemed reasonable to include the study with this finding. For Liverant and Scodel, the independent variable is internal vs. external psychological control. Internally controlled persons are those who attempt to maintain control of the environment in chance-dominated situations by a cautious and planned selection of probabilities. Externally controlled persons are those who choose among alternatives on the basis of "hunches" or previous outcomes. A scale was constructed, based on Rotter's Social Learning Theory, that measures the degree to which an individual perceives outcomes as within or beyond his personal control.

The Liverant-Scodel findings are as follows: Internally-controlled people (i.e., those who see themselves in control over the environment) choose more risks of intermediate probability and fewer risks of low probability than externally controlled people. More internally-controlled than externally-controlled people never select an extremely high or low probability risk. The amount of resources committed on safe, as against risky, choices is greater for internally-controlled than for externally-controlled people. Finally, there is a tendency (though this result is not statistically significant) for internally-controlled people to be less variable in their choice of alternative risks.

Proposition 36. There is a relationship between several personality characteristics and the tendency to choose a risky alternative.

This proposition is stated in general terms so that it can encompass a number of independent variables used in one study of risk-taking. It was thought not worthwhile to express the separate findings in separate propositions.

In this experiment, risk taking was measured in a gambling situation in which each subject was required to bet on the outcome of the toss of a pair of dice 50 times. On each trial the subject selected a bet from nine alternative outcomes with known objective probabilities, but different expected values The risk, of course, was the trade-off between probability and payoff: the lower the probability, the higher the payoff. The subjects were 28 Air Force enlisted men, 34 college undergraduates, and 8 graduate students in mathematics.

Scodel, Ratoosh, and Minas (1954:27) report the following findings: Intelligence is not significantly related to risk-taking behavior, but was related inversely to variability in risk-taking. Similarly, subjects who are sophisticated about probabilities and expected values (the mathematics graduate students) are no more likely to maximize expected dollar value than others. Individuals who display a fear of failure are more likely to choose less risky alternatives. Individuals high in need achievement (a concern with either vocational success, job performance, status symbols, or money as the road to success) select intermediate risks more often than subjects low on need achievement. These same individuals (the high need achievement subjects) are more likely to choose low payoff alternatives, while the low need achievement subjects choose high payoff alternatives. Finally, it was found that the military group of subjects tended to choose more risky alternatives than the college group. The authors summarize their findings by saying that low risk individuals as compared to high risk individuals are a more other-directed, more socially assimilated, and more middle-class oriented group.

Proposition 37. The more personnel decisions made by an individual in the past, the more accurate are his decisions.

In Taylor's (1972) simulation discussed earlier in this chapter, there were several measures of an individual's supervisory experience: the number of people the decision-maker supervises, the percentage of his time on the job that is spent in supervision, whether or not the decision-maker had ever hired or promoted anyone, the approximate number of such decisions made, and the individual's age. Only one of these measures—the number of personnel decisions made by the individual—showed any correlation to the quality of the individual's

decision-making (Taylor, 1972:444). And even this finding is of very limited generalizability: the simulation was of a decision on personnel choice, so that one would expect past experience at this type of decision-making to be related to decision accuracy.

Proposition 38. The more dogmatic an individual, the more accurate are his decisions.

This proposition is again from Taylor's (1972:444) simulation. Dogmatism is defined in terms of the degree to which the individual is "open" or "closed" in his value system. It is interesting that the more closed individuals produce better decisions in terms of the number of errors made. The author presents no explanation of why this should be the case.

Proposition 39. Individuals unable to overcome the interference of anxiety on task performance make more errors in decision-making under stress than under non-stress, while individuals who overcome this interference show no change from non-stress to stress.

As before, Lowe (1961:303) is trying to examine the psychological mechanism that mediates the relationship of stress to decision-making performance. Whereas in Proposition 34 he was examining the speed with which an individual makes decisions, here he examines the accuracy of those decisions.

Lowe studies what he calls the interference-prone individual. This is the person who does not have the ability to resist and overcome the direct interference of anxiety on task performance. That is, anxiety is acting as a direct determinant of performance. In a crisis, of course, anxiety increases, there is more interference with performance, and the quality of the decisions the individual makes is expected to decrease. This is exactly what Lowe finds. Interference-prone individuals made more decision errors under stress than under non-stress, while the error rate of individuals not prone to interference did not change.

Proposition 40. The more dogmatic an individual, the more confident he is of his decision after it is made.

In this and the following proposition, we deal with a dependent variable that we have not come across yet. Essentially, these variables get at the decision-maker's orientation toward his decision. They are part of what might be called the post-decision process. As such they may form part of the feedback information that inputs into the following round of decision-making.

Taylor (1972:444) finds that people with a "closed" value system tend to have more confidence in their decisions after making the choice than people with an "open" value system. This is probably expectable: those people who do not accept any questioning of their values and behaviors would likely be convinced that their decisions were correct. A more interesting finding is embodied in the next proposition.

Proposition 41. The older a decision-maker and the more supervisory experience he has, the less confidence he shows in a decision he has made and the more willing he is to change his decision when faced with new and contradictory information.

This proposition perhaps begins to settle a contradiction between two bits of conventional wisdom about a decision-maker's orientation toward his decisions. One piece of conventional wisdom is that as a person mellows in his role, he becomes more appreciative of the complexities of the situation facing him and less sure that there are stock answers to the problems. He is, consequently, less confident and more flexible in his decision-making. The other piece of conventional wisdom is that as a person stays in a role, he becomes set in his ways and committed to certain positions. Thus he is more confident in the decisions he makes and less flexible in changing them. This finding from a simulation (Taylor, 1972: 443) supports the first interpretation. It suggests that as bureaucrats gain experience, they become better decision-makers.

Proposition 42. There is no difference between the effects of increasing success or failure on the tendency of an individual to choose risky alternatives.

In the presentation of the propositions in this chapter, we have followed what is a rough chronological order of decision-making tasks, assuming those tasks are performed in some kind of time sequence. We started with a proposition on the decision that an event in the environment is a threat and should be treated as a crisis. Then we considered propositions on the decision-maker's processing of information about that event. The chapter then moved to some research on the response rate with which decisions are made, and to the kind of alternatives that are chosen in terms of their risk content and their general quality or accuracy. Finally, we discussed a couple of propositions that dealt with the orientation of a decision-maker to his choices once those choices are made.

In this proposition we carry the decision process one step further. Here we are looking at the feedback of policy output. That is, once choices are made, what is the effect of the success or failure of those choices on subsequent decision-making? This kind of feedback process is much neglected in the literature, both in psychology and sociology, as well as in political science.

In an experiment involving the Tactical and Negotiations Game (Streufert and Streufert, 1970:396), 44 two-man teams had to make economic and military decisions to "beat" another team. In each of six 30-minute periods, the teams received seven messages. This feedback information was varied in content, from either one success and six neutral messages to six success and one neutral message, or from one failure and six neutral messages to six failure and one neutral message. Neither the increase in success feedback nor the increase in failure feedback was related to a change in the tendency of the decision-makers to choose risky alternatives.

PART II

THE GROUP LEVEL

CHAPTER 5

THE EFFECTS OF CRISIS ON INTERACTIVE PROCESSES

Like the second chapter of this report, this chapter focuses on those behaviors which can be conceptualized as intermediate processes in crisis management. That is, the dependent variables are not the performance of decision-making tasks—the "end product" of crisis management—but a number of behaviors or processes that occur within the group as a response to a crisis situation, and which in turn affect decision-making performance. These include such things as group conflict, leader-member relations, the handling of information, and so on.

Proposition 43. In a crisis situation, conflict within the decision-making group increases.

This is a very important proposition, for group conflict has a number of consequences, as we shall discuss in the next several findings. Despite its importance, however, it is a fairly obvious finding, and we need not dwell on it. A crisis is a situation of high threat, so the stakes for the participants are raised. From their different perspectives, the participants bring different interpretations to the events and advocate different alternatives, thus creating conflict. The tension is aggravated by the time pressure under which the members are working. This increase in interpersonal conflict is substantiated by research on crisis situations (Paige, 1972) and by interviews with crisis managers in the State Department (Lentner, 1972), as well as by experimental research. Let us now turn to the several important consequences of group conflict for crisis management decision-making. In our model, these are about the only findings that make the link between a variable at the intervening behavior level and variables that relate to the performance of decision-making tasks.

Proposition 44. In groups in which there is conflict over goals, as opposed to groups in which there is goal agreement, more information will be exchanged if a unanimous decision is required. If the decision is by majority rule, the two groups hardly differ in information exchange.

This proposition expresses one of the positive effects of group conflict that is aroused in a crisis situation. Fifty-eight groups of three men each were divided in an experiment by Bower (1965a:284) so that each was either in a conflict situation or a non-conflict situation. In addition, the groups were divided by the type of decision rule that was imposed: decisions had to be unanimous for half of the groups and by majority rule for the other half. When decisions had to be made by majority rule, conflict did not make a difference in the amount of information that was exchanged in the decision-making process before a choice was made. But under a rule of unanimity—the most difficult situation in which to produce a group decision—the groups in conflict exchanged more information than the non-conflict groups. If, as the author suggests, information exchange is a rough measure of how rational a group's procedures are, then it can be concluded that in the difficult choice situation when a unanimous decision is required, groups in conflict act more rationally (i.e., exchange more information) than groups not experiencing conflict. This finding expresses a positive effect of crisis on decision-making.

Proposition 45. Groups experiencing substantive conflict in a crisis situation more frequently employ creative alternatives than groups without conflict.

It might be expected that when more information is exchanged, the alternatives that are generated are creative. Hall and Williams (1966:218) investigate this second positive effect of conflict in a crisis situation. Creative alternatives are defined as alternatives that did not exist prior to the group interaction. That is, these alternatives were not advocated by any member of the group prior to group discussion, they were created by the group as a whole in the interactive process and were used in the final group decision in lieu of pre-existent individual solutions. A small group experiment indicates that groups experiencing

high substantive conflict (conflict that is task-oriented) employ creative alternatives more frequently than groups in low conflict.

In this and the previous proposition, we have established that groups in conflict exchange more information and more frequently use creative alternatives. These are two crucial elements of effective decision-making. We might expect, therefore, that conflict will be positively related to general measures of group decision-making performance. This question is answered in the next finding.

> **Proposition 46. Groups experiencing conflict in a crisis situation show more effective performance of decision-making tasks than groups in little or no conflict.**

Rather than being a detriment to performance, as one might expect, the group conflict that is aroused by a crisis appears to improve the effectiveness of decision-making. This is an important finding for crisis managers.

One of the best pieces of research on this subject is a study of the performance of air crews in "survival" situations (Torrance, 1957:314-316). Although these are not foreign policy crises, they are crises, and real decision-making tasks must be performed, so the research is more relevant than other literature based on psychological experiments. Torrance is analyzing what he calls task-oriented disagreement rather than person-oriented disagreement. These terms are pretty self-explanatory. Task-oriented disagreement arises from a divergence of expressed judgment on alternative solutions to the crisis. Person-oriented disagreement arises when group members are using the crisis situation to foster their own advancement, without regard to the effective solution of the problem. In his review of the results of the survival project. Torrance concludes that task-oriented disagreement improves group effectiveness, while person-oriented disagreement impedes it. More specifically, when crisis arouses task-oriented disagreement, decision-making performance is superior in that the decisions are more accurate and more adaptive to the situation, and the group shows a willingness to take calculated risks and an unwillingness to accept defeat.

In an experiment which we have already mentioned, Bower (1965a) adds some variables to provide a more detailed and complex explanation of the effect of group conflict on general decision-making performance. One variable he adds is the decision rule--either unanimity or majority rule. Another is whether or not the group makes any decision at all, that is, whether or not it completes its task. No doubt decision-makers would verify that crisis management groups do not always reach a decision, so this should be an important consideration in research. Finally, Bower adds the variable of type of information available to the group. Group members can have either unique, complementary ("special") information, or they can have overlapping and partially substitutable ("general") information.

Bower's (1965a:284-286) findings are as follows: First, when there is no conflict, a group makes better choices under a decision rule of unanimity than under majority rule. For groups experiencing conflict, however, there is no difference in quality of decision choice in the different decision rules. Second, under majority rule, groups in conflict make better choices than groups not in conflict. Under unanimity, this is not so: the non-conflict groups make better choices than the conflict groups. But this is because a unanimous decision rule occasionally obstructs the conflict group from making any choice. When those cases in which a group did not reach a decision are left out (5 out of 58 cases in the experiment), then conflict groups perform better than non-conflict groups under unanimity also. Finally, in searching for an explanation of the factors which inhibit a group from making any choice at all, Bower finds that when the members possess unique, complementary information, they are more likely not to make a choice than when the members possess overlapping and partially substitutable information.

Bower (1965a:285) draws an important conclusion from his research; groups in conflict are better in the decision-making tasks of search and analysis of alternatives. When it comes to making a decision, however, groups in conflict perform less well: the decision-making process more often breaks down with no choice being made. The implication is that the crisis manager encourage conflict in the group in the search and analysis tasks, and discourage it in the task of reaching an agreement. Alternatively, the crisis manager could set up two

different groups, one in which there was conflict in order to improve search and analysis activities, and one in which the conflict level is kept low in order to improve the chances of reaching an agreement.

Proposition 47. The greater the group conflict aroused by a crisis, the greater the consensus once a decision is reached.

This proposition expresses the last of the positive effects of crisis-induced conflict on aspects of decision-making. In the research on survival behavior, Torrance (1957:316) reports that for air crews in which a great deal of disagreement occurred in the process of considering a decision, there was high consensus among the group on the final decision once it was made. The explanation is that once all group members have participated in the decision-making and expressed their opinions, they are more willing to accept the decision of the group.

Guetzkow and Gyr (1954:380-381) examine this proposition, but provide a much more complex explanation of the process. Their analysis is based on observations by three judges of seventy-two business and governmental decision-making groups in real situations. In addition, group members completed a questionnaire and were interviewed. Approximately one hundred measures were used to characterize behavior. Group conflict was categorized as either substantive (task-oriented, group goals) or affective (person-oriented, satisfaction of self-oriented needs).

Guetzkow and Gyr have made observations on the conditions in which these two types of group conflict lead to consensus on the final decision. Substantive conflict leads to high group consensus when facts are available and are used, when the participants feel warm and friendly toward each other in a personal way, and/or when a chairman, through active solution-proposing, aids the group in penetrating its agenda-problems. Affective conflict leads to high group consensus when the participants withdraw from interpersonal contact with each other, when the participants withdraw from the problem situation and have little interest in what is being discussed, and/or when the group withdraws from its problem-solving activities by tackling only discrete, simpler agenda items and postpones consideration of others. Finally, substantive and affective conflict lead to high group consensus when the group's

problem-solving activity is understandable, orderly, and focused on one issue at a time. There is a generally pleasant atmosphere, the participants recognize the need for unified action, there is little expression of personal, self-oriented needs, and whatever self-needs are expressed tend to be satisfied during the course of the meeting.

Proposition 48. The longer the amount of time available in which to make a decision, the greater will be the consensus on the final choice.

On the subject of consensus, we find a number of studies that relate the amount of decision time to the degree of consensus supporting the decision of the group. Note that the findings of Torrance, previously mentioned above, support the explanation that once all group members have participated in the decision-making and expressed their opinions, they are more willing to accept the decision of the group. One of the factors that allows greater participation, besides the degree of authoritarianism of the leader, is the amount of time available before a decision must be made. One would expect that the greater the decision time, the greater the participation, and therefore the greater the consensus. If a group is under short time pressure, the members do not change their initial positions substantially (Frye and Stritch, 1964:141). In such a situation, they are less willing to accept some other member's preferences if those become embodied in the final choice. However, under an extended decision time, individuals, through their increased participation in group discussion, begin to change their initial positions, the dissenters withdraw, and consensus is achieved (Paige, 1972:52; Frye and Stritch, 1964:141). Of course, in a crisis the amount of time available for decision-making is, by definition, limited. The policy implication is that, if consensus is a valued aspect of group interaction, then the decision time should be extended as much as possible.

Proposition 49. In crisis, there is an increased volume of communication to be handled by decision-makers.

With this proposition we turn away from the several findings that expressed the consequences of increased group conflict due to a crisis. Like the first of that set of findings,

which merely established the fairly obvious relationship between crisis and conflict, the first of this next set of findings is obvious also. The implications, however, are extremely important, and we shall deal with them in the next four propositions.

This positive relationship between crisis and communications volume is substantiated in several different analyses. In his simulation of international politics, Hermann (1972b:201-202) finds that both the rate of communications and the perceptions of the rate of communications by decision-makers increase. In another simulation, a realistic representation of police action in responding to a disaster, the rate of internal communication increased substantially, as did the length of the messages (Drabek and Haas, 1969a:232). Milburn (1972:260) supports these analyses in his review of the literature. We might add that the cost of information transmission per bit of information flow at very high rates is greater than the cost at low rates (Miller, 1960:697).

The communications load is a product of two factors: First, it depends on the volume of incoming information; this is the subject of the findings reported in the previous paragraph. But it is also dependent on the number of communications channels open to handle the incoming information. If the number of channels increases in a crisis as the volume of information increases, the load remains the same.

Proposition 50. In crisis, the number of communications channels available to handle incoming information decreases.

In fact, the number of communications channels does not increase to meet the heavier load in a crisis, it decreases. Holsti (1972b:73) illustrates this in his comparative analysis of the pre-World War I crisis and the Cuban missile crisis. He is supported by the theoretical analysis of Hermann (1963:68) and the literature review of Milburn (1972:272). So the volume of information increases and the number of channels to handle that information decreases at the same time in a crisis. The effects of this increased communication load are expressed in the next propositions.

Proposition 51. The greater the communications load in a crisis situation, the greater the tendency to rely upon extraordinary, ad hoc channels of communication.

Under a high communications load, decision-makers may go outside the regular communications system to cope with the volume of incoming information. Miller (1962) finds that they will seek to bypass both the effects of information overload and the distortion of content in transmission by the use of improvised, *ad hoc* channels of communication. These may include such things as direct communication between heads of government and employment of special emissaries. In his analysis of the Cuban missile and pre-World War I crises, Holsti (1972b:75) supports this observation. In the 1914 crisis, he finds that of 1,530 interstate messages between June 27 and July 28, only 4.8% were direct communications between central decision-makers. Most communication was directed through normal diplomatic channels. However, during the last seven days of the crisis, the number of messages sent directly to another state's central decision-makers jumped to 9.3%. The difference between the two figures is statistically significant at the .001 level.

Proposition 52. As the communications load increases to high levels, there is greater consultation within the organization before decision-making, and a need arises for someone to function in the role of a display mechanism to facilitate the sharing of information.

Under normal demand loads, members of an organization function rather autonomously; when there is high demand relative to capacity to handle the load, there is a greater rate of consultation in that members ask each other for information before making decisions (Drabek and Haas, 1969a:233). In this sense, then, there is a decrease in autonomy. In this situation, the pattern of communication changes. In the police simulation that they conducted, Drabek and Haas (1969a:235) observed that information requests from dispatchers decreased while requests from sergeants increased. Under normal demand, dispatchers directed their information requests to complaint clerks, while in stress, they directed these requests to sergeants. They conclude that the sergeants began to play a role that was not adequately provided for in the formal organizational structure: that of a "display" mechanism whereby incoming information could be shared.

Proposition 53. As information load increases, the organization will adopt various mechanisms of adjustment to handle the overload.

A review of the literature and of an ongoing research project by Miller (1960:697) yields a number of hypotheses on the mechanisms that are adopted by an organization to cope with information overload. The findings should be regarded as theoretical, with some, but not conclusive, empirical support. The mechanisms of adjustment used by an organization are: (1) omission—the temporary non-processing of information; (2) error—processing incorrect information, which may enable the system to return to normal processing afterwards; (3) queuing—delaying the response during a period of high overlap of input information in the expectation that it may be possible to catch up during a lull; (4) filtering—selecting only certain categories of information to process; (5) cutting categories of discrimination—responding in a general way to the input, but with less precision; (6) employing multiple channels—processing information through two or more parallel channels at the same time (decentralization is a special case of this); and (7) escape—complete avoidance of responsibility for the task.

Proposition 54. In a crisis situation, there is a greater need for effective leadership.

With this proposition we turn to another aspect of group interactions in the decision-making process, to present a number of findings on leadership in the group.

In his analysis of the Cuban missile and Korean War crises, Paige (1972:52) notes that as the decision time increases in a crisis situation, there is a greater need for effective leadership, in order to handle interpersonal relationships in the decision-making group as well as to direct the management of the crisis. That is, as the length of the crisis increases, there is greater conflict within the organization and a consequently greater investment of emotional affect in policy and personal differences. An effective leader is needed to resolve these interpersonal differences and insure that the group concentrates on the task.

What happens if the leader fails to provide effective leadership? The next proposition addresses this question.

Proposition 55. In a crisis but not in non-crisis, the group tends to replace its leader with a new person if the leader does not have an obvious solution to the crisis problem.

Here we see a direct effect of crisis on group interactions. Whether or not the group replaces an ineffective leader depends on whether or not they are working in a crisis environment. In crisis, the group changes its leader if he does not solve the problem. The person originally second in influence becomes the leader, while the originally most influential person drops to second place. In a non-crisis situation, this does not happen; the most influential person remains dominant. However, once a person becomes the most influential member of a group, he tends to have more influence during periods of crisis than during periods of non-crisis. These findings are from the research of Hamblin (1958b:329, 332-333) on small decision-making groups in a game exercise. The latter finding is particularly true in a small group. Hare (1952:265) finds that the leader in the group of five will have more influence in the group decision than the leader in the group of twelve.

Proposition 56. The greater the crisis, the greater is the clarity of differentiation between task leadership and emotional affect leadership roles.

Hamblin (1958b) identifies three types of leadership roles. *Substantive* or *task* leaders have the most influence in ideas on solving the group's environmental problems. *Procedural* leaders have the most influence in coordinating the activities of the various members into a cooperating whole. *Socio-emotional* leaders have the most influence in helping group members handle their emotions and thus in maintaining group cohesion. These distinctions that elaborate the role structure of groups are important ones, and they deserve attention. Very little research has been done in this area.

In his analysis of the Korean and Cuban crises, Paige (1972:46-47) finds that the roles of task leadership and socio-emotional leadership were performed by different people. The task leader was someone other than the President. This person, who had especially close affective ties with the President, contributed most to clarifying a recommendation for

action to the President. In the Korean decision, this role was performed by the Secretary of State, Dean Acheson; in the Cuban missile crisis, it was performed by the Attorney General, Robert Kennedy. The socio-emotional leader in these two cases was performed by the President. Paige notes that both Truman and Kennedy acted to keep the decision-making group together, to preserve the cooperation and satisfaction of group members, at a time when there was high substantive disagreement, with various members having stakes in different alternatives.

In a crisis, as the proposition suggests, the roles become more differentiated. That is, whereas in non-crisis an individual might function in both roles, in a crisis he concentrates on only one. Those who are primarily human relations-oriented (socio-emotional role) will pay less attention to the task and more attention to the human relations aspects of group interaction, while those who are primarily task-oriented will become much more so in a crisis and totally neglect human relations (Miiburn, 1972:266) The important question, of course, is what effect this has on group performance. An answer is given in the next proposition.

Proposition 57. The effect of type of leadership role on decision-making performance depends on the favorability of the decision situation.

The favorability of the decision situation is defined by Fiedler (1971) as the degree to which the situation provides the leader with potential power and influence over the group's behavior. The concept is operationalized in terms of three components: leader-member relations (favorable when the group respects and accepts its leader); task structure (favorable when the task is highly structured and clearly outlined); and position power (favorable when the leader has specified powers over the members). In the studies on leadership effectiveness, Fiedler (1971:131) finds that leadership that is task-oriented leads to effective group performance when the situation is very favorable or very unfavorable. Leadership that is relationship-oriented (socio-emotional role) leads to effective group performance when the situation is one of intermediate favorability.

CHAPTER 6

THE EFFECTS OF GROUP STRUCTURE ON INTERACTIVE PROCESSES

In this chapter we examine the effects of variables such as the size of the group, the instructions given to a group, and the task differentiation in the group on the interactive behaviors of group members. The chapter is represented by link "G" in the diagram of the organizational framework presented in the Introduction. These propositions get at the crucial question of determining how best to set up a decision-making group for handling a crisis. How the group is structured determines the group processes such as conflict, leadership, and so on, and these in turn determine how effectively the group will carry out its decision-making tasks.

The large difference between the number of research studies surveyed in this chapter and the number included in Chapter 7 indicates where the focus of the literature has been. Most analysts have studied the link between group structures and decision-making performance, thus treating the group as a "black box" and ignoring the interactive processes that intervene between structure and performance. For reasons explained in the Introduction to this report, we consider this an unsatisfactory approach. There must be much more research on the link represented by this chapter so that the two chapters can be merged to provide a more theoretically meaningful explanation. The small number of studies surveyed in this chapter indicates one of the major gaps in the literature.

Proposition 58. The smaller the group, the greater the amount of influence the leader will have.

In a study of a problem facing groups of Boy Scouts, Hare (1952:265) finds that the size of the group has a number of effects in terms of the interactive behaviors of the group. One of these is on the amount of influence a leader will wield. The study indicates that the

leader in the group of five will have more influence in the group decision than the leader in the group of twelve. Of course the finding is limited in its transferability to crisis decision-making by the nature of the task involved and the subjects used. There are no other studies which we have examined that focus on this proposition.

Proposition 59. The smaller the group, the greater the amount of consensus that will be achieved through group discussion.

In the same experiment, Hare (1952:264, 266) finds that as the size of the group is increased from five to twelve people, the amount of consensus on the final decision decreases. He attributes this to a decreased degree of participation in the larger group. Apparently, in the group of twelve people, members tend not to participate as frequently because they feel that their opinion is not important for some reason related to group size. With the decreased participation comes decreased consensus.

Proposition 60. Group members of lower status and power tend to resist accepting the final decisions of the group.

Another aspect of the problem of building a group consensus is the relative status and power of group members. In structuring the decision-making group, the crisis manager makes decisions about what members will be included. If building a consensus is valued by the crisis manager, then he should include people of relatively similar power and status. Research shows that group members of lower status and power are unwilling to join the consensus of the group (Torrance, 1957:317). As in the previous proposition, this may be related to the decreased participation of these members. The same study (Torrance, 1957:316) shows that members of lower status and power are less willing to disagree or otherwise influence the group's decision, even if they have the correct solution.

Proposition 61. The instructions given to a group in terms of speed and quality of performance have no effect on the member's participation in, and satisfaction with, the group.

Dubno (1963:274) has examined the interactive processes of small decision-making groups faced with different sets of instructions for the performance of tasks. The instructions were rated as favorable or unfavorable, depending on the congruency of three elements. Favorable instructions were those in which the leader is a fast decision-maker, the instructions to the group are to proceed fast, and speed rather than quality is emphasized. Alternatively, favorable instructions are those in which the decision-maker is slow, the instructions are to proceed slowly, and quality rather than speed is emphasized. The expectation is that in groups with congruent sets of instructions, member participation and satisfaction (as expressed by subject's evaluations) will be high. In fact this is not the case. No relationship is found between the variables.

CHAPTER 7

THE EFFECTS OF CRISIS ON GROUP DECISION-MAKING PERFORMANCE

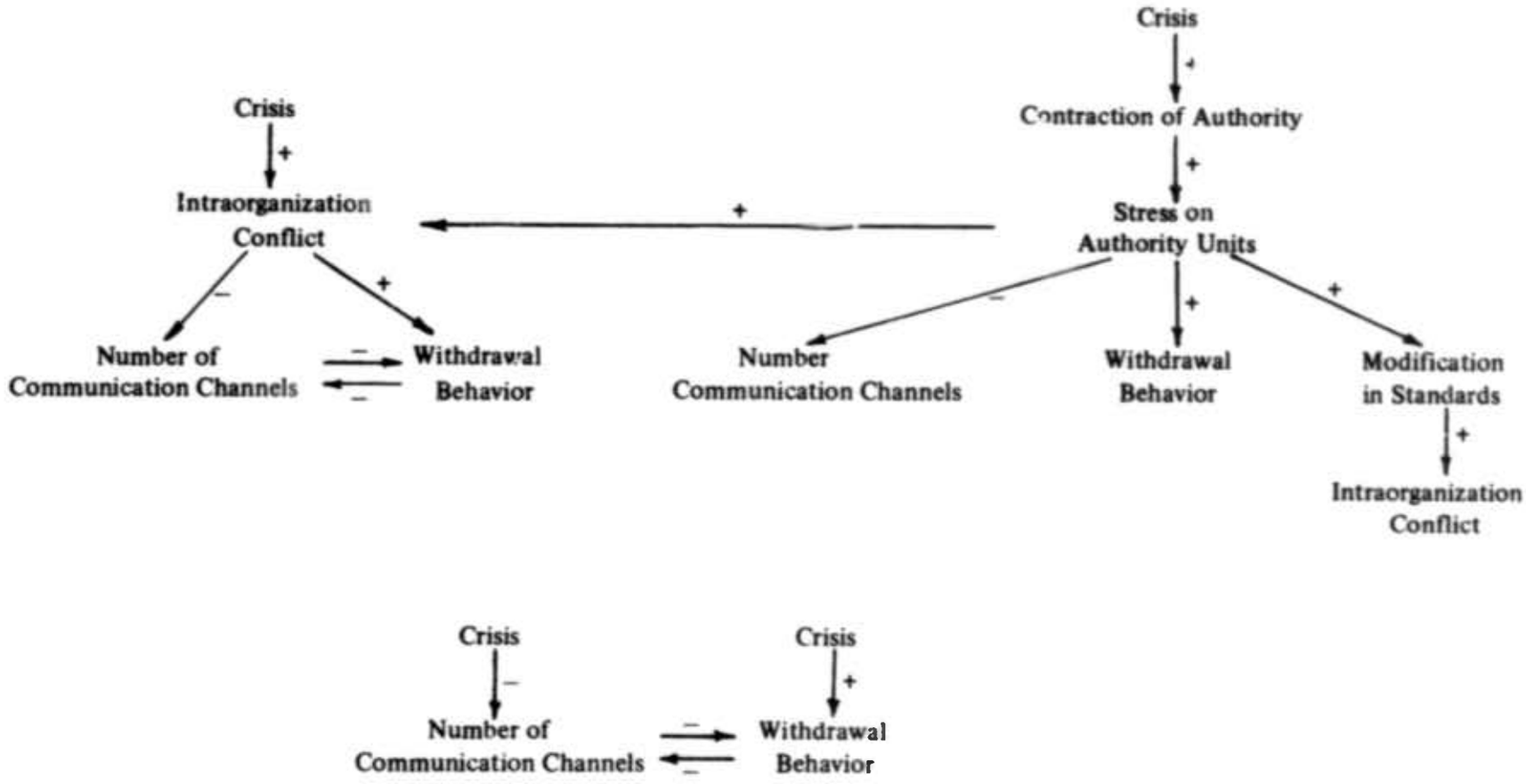
A great number of studies, mostly from the social psychological literature, have examined the link between crisis and the group's performance of decision-making tasks. It is our contention, expressed in the model presented in Chapter 1 of this report, that this link is a theoretically unsatisfactory one because it leaves out the intervening mechanism by which a decision-making response occurs. That is, a crisis impacts on a group, and it is the dynamics of the group that then determines decision performance. The hypotheses presented in this chapter are derived from research studies that omit the intervening mechanism. Thus a long-range goal is to link the findings of the fifth chapter with the findings of this one.

Proposition 62. Crisis adversely affects the viability of an organization in performing its decision-making tasks.

We begin with this very general proposition, in order to present the results of a theoretical analysis of Charles Hermann. Hermann (1963) presents a model of administrative behavior in a crisis that attempts to account for the adverse effects of crisis on the viability of the organization handling the crisis.

Basically there are two main explanatory chains, as shown in Figure 1. Starting with the left-hand chain, the hypotheses (they have not been subjected to empirical test) are as follows: As pre-crisis organizational integration decreases, a crisis will tend to intensify any conflicts existing prior to the crisis within the organization. This has two effects. The greater the intraorganization conflict, the fewer the number of communication channels available for the collection and distribution of information. And the greater the intraorganization conflict, the greater the tendency for organization members to withdraw from organization tasks

Figure 1. Interpretation of Hermann's Model of Administrative Viability



and activities. In addition, there is an interdependent relationship between these two effects of organizational conflict. That is, a reduction in the number of communication channels connecting a unit to the remainder of the organization increases the unit's withdrawal behavior. And increased withdrawal behavior reduces the number of communication channels connecting a unit with others in the organization.

Turning to the second link, we see that the greater the crisis, the greater the contraction of authority in the organization. That is, fewer people will be making decisions. This puts increased stress on authority units. The stress on authority units has four consequences. One is that it increases the amount of conflict within the organization. This is the link that connects the two chains. A second is that the greater the stress on authority units, the smaller the number of available communications channels. A third is that the greater the stress on authority units, the greater the tendency of units to withdraw from organizational tasks. Finally, the greater the stress, the greater the tendency to institute modifications in organization standards. This leads to further withdrawal behavior on the part of units in the organization, and to a greater conflict among organizational units.

There are also some direct links shown at the bottom of Figure 1. Hermann postulates that crisis directly affects the number of communications channels. The greater the crisis, the less the number of channels available for information flow. And he postulates a direct link between crisis and withdrawal behavior. As pre-crisis organizational integration decreases, a crisis will lead to greater withdrawal behavior.

We turn now to a series of findings specifying the effects of crisis on various decision-making tasks. As before, we order these by the dependent variable in a rough chronological model of the process—from processing information to the consideration of alternatives to the choice of an alternative, and finally to feedback.

Proposition 63. As the volume of information in a crisis increases, the search for information becomes less thorough and selectivity of attention becomes more important.

At the very time when a tremendously increased flow of information is coming into the decision-making organization and when there is a great need for a maximum amount of information, the search for information in the preliminary stages of decision-making becomes less thorough. This conclusion is drawn by Holsti (1972:13, 19) from his analysis of the literature. The decreased attention to information is one method the organization adopts to cope with increased stress. The organization confines its search for information to certain types of information. This selectivity becomes a crucial factor in determining whether decision-makers will perceive that a crisis exists. If the information is of a new type—that is, the situation has not been experienced before—it is likely to get selected out. Thus Williams (1957) formulates the hypothesis that information about a possible future threat, which has not been experienced in the past, tends to have relatively low value in getting the attention of the information-processing apparatus of the organization. This tendency to respond only to recognizable cues in the search for information becomes one of the severe limiting factors in organizational response to crisis.

The amount of information that is acquired depends not only on the volume of information, but, as one might expect, on the cost of information. The next proposition deals with this factor.

Proposition 64. The greater the cost of information, the less information will be acquired.

Lanzetta and Kanareff (1962) posit a relationship between the cost of information and the payoff of a correct decision. When information has a zero cost, the payoff of the associated decision is low; when information cost is high, the decision payoff is correspondingly high. It is found that the cost of the information rather than the payoff of the decision is the motivating factor in a choice situation. That is, individuals acquire more information when the cost of information is zero (even though the payoff is low) than when the cost of information

is high and the payoff is also high (Lanzetta and Kanareff, 1962:467). It is interesting to note, however, that information acquisition does not affect the time taken to make a decision. The study indicates that individuals take as long to handle a problem under high cost-high payoff conditions than under low cost-low payoff conditions, even though they acquire less information.

The amount of experience in handling the decision-making task seems to reinforce these tendencies. When information cost is zero, there is a gradual increase in information acquisition over trials, and when information cost is high, there is a gradual decrease in information acquisition over trials (Lanzetta and Kanareff, 1962:467).

Motivation to achieve a correct decision also seems to be a factor. Under low cost-low payoff conditions, the amount of information acquired increases as motivation increases. Under high cost-high payoff conditions, there is less variability in information acquisition across levels of motivation.

Proposition 65. General information shared by the group rather than specific information available only to certain members leads to better decisions.

Not only is the volume of information important in crisis decision-making, as the last two propositions indicate, but obviously the content of information is also significant. Selectivity of attention or low rates of information acquisition may not be an impediment if irrelevant information is selected out and only pertinent information is acquired by decision-makers. Thus the type of information becomes as important as the volume of information. Little research has been conducted on this subject, but one investigation is reported in this proposition.

In a small group experiment, Bower (1965:286) varied the coverage of the information provided to group members. Information was either "general" or "special." General information represented the range of possible experience in the subject's environment; for each subject, the general information provided overlapped by 50 percent that possessed by

other members of his group. In contrast, special or specific information was exhaustive concerning one of the three elements of the decision that had to be made; for those groups using special information, each member was given the information for a different element of the decision. The analysis indicates a very strong relationship between type of information and quality of the alternative chosen. Those teams provided with general, shared information almost always made better decisions.

Proposition 66. The more severe are the various elements of a crisis, the smaller the number of alternatives which will be considered.

We turn now from the general search for information in the preliminary stages of decision-making to the more specific search for alternatives to solve the problem at hand. It is a reasonable hypothesis that the more severe the crisis, the smaller the number of alternatives that will be considered by the decision-making group. In large part this is a function of the amount of time available. Both studies of specific crises (Paige, 1972:306) and more general analyses (Milburn, 1972:273; Robinson, 1972:304) indicate that when decision time is short, the number of alternatives considered decreases, and conversely, when decision time is extended, more alternatives are considered.

In part the number of alternatives considered is a perceptual phenomenon not entirely subject to the amount of time available for search activity. As such, it becomes part of the distorted perceptual judgment that occurs in a crisis. In his study of the pre-World War I crisis and the Cuban missile crisis, Holsti (1972b:70) finds that as stress increases, decision-makers perceive the range of alternatives open to themselves to become narrower, and the range of alternatives open to the adversary to become broader.

The debilitating effect of crisis on the consideration of alternatives suggests two requirements for effective crisis management. One is the need for an early warning system so that a potential crisis can be recognized at the earliest possible moment and the consideration of alternatives can begin. In support of this, Snyder (1961:80) finds that more options are considered when the need for a decision is anticipated. The other is that once a crisis has

begun, any action that will increase the amount of time available before a decision has to be made will be functional in terms of widening the range of alternatives that is considered.

Hermann (1972:198-201) modifies this proposition with a more subtle analysis. In his simulation of an international crisis, he separates the components of crisis–threat, time, and surprise–to examine their separate as well as their interactive effects. His findings are as follows: There is no statistically significant relationship between the interaction of all three elements and the number of alternatives considered. However, as time increases, fewer alternatives are considered. As threat increases, more alternatives are considered. As threat increases, the amount of decision time available becomes more important in determining the consideration of alternatives. Under the most crisis-like conditions–of short time and high threat–there will be more alternatives considered. If there is more time available, the decision-makers use it for other tasks of decision-making than generating alternatives. Thus Hermann's analysis partly contradicts Proposition 61; he finds that a crisis is conducive to the consideration of a large number of alternatives. It is only a partial contradiction, however. He does find that in situations which are anticipated, decision-making groups are likely to generate a greater number of alternatives than in surprise situations.

Generating a large number of alternatives will be meaningless if those alternatives are not creative solutions to the problem. The next proposition addresses this question.

Proposition 67. Stress to moderate levels enhances the creativity of the alternatives proposed by a decision-making group.

Back (1961) cites a study that finds a curvilinear relationship between stress and creativity. Stress to moderate levels gets the "creative juices" flowing; there is much evidence that suggests that some moderate stress is necessary for all creative activity. Beyond moderate levels, however, the literature indicates that stress has adverse effects on the creativeness of proposed alternatives (Holsti, 1972:14-15).

Proposition 68. The tendency to choose a risky alternative increases with continued participation in a decision-making task.

As in the other chapters of this report, we will try to specify what kinds of alternatives will be chosen by groups in crisis situations. The first research we examine is on the question of the risk content of the alternatives.

In two different experiments, it is found that the longer a decision-making group spends handling the crisis situation, the more prone it is to take risks (Streufert and Streufert, 1968:328; 1970:396). In a simulation, military decisions were considered risky if they were aggressive rather than defensive in nature and placed troops or equipment into positions in which they were in immediate danger of attack or destruction. Economic decisions were considered risky if funds were invested in projects in which the probability of a successful outcome was uncertain. The risk-taking tendency increased over time for both types of decision-making. It also increased over time with increasing feedback, either positive or negative. That is, in groups in which the incoming information indicated either increasing success or increasing failure, tendency to choose a risky alternative increased with continued participation in the task.

One implication of this proposition is that in a crisis situation, risk-taking behavior will be lower than normal. In a crisis, decision time is short and there is no repeated performance of decision-making tasks. According to this proposition, then, we would expect that decision-making groups would choose less risky alternatives in a crisis. Whether or not this is desirable depends on the situation and on a number of values and goals associated with the situation.

That risk-taking by a group decreases in a crisis is also supported by the next proposition.

Proposition 69. There is a curvilinear relationship between informat load and risk-taking behavior, with risk-taking at its highest at optimal information levels.

In a simulation, decision-making groups received either two, five, eight, ten, twelve, fifteen, or twenty-five bits of information on the decision environment. Each bit contained one informative fact relevant to a single operation. An earlier experiment had indicated that ten or twelve bits of information per decision period was optimal, with suboptimal loads being less than ten bits and superoptimal loads being more than twelve bits. The findings indicate that the tendency to choose risky alternatives increased to its highest level as the information load reached the optimum of ten or twelve bits of information per period. Beyond that load, risk-taking behavior decreased (Streufert and Streufert, 1968:328).

If crisis is characterized by information overload, as we have seen, then this proposition indicates that risk-taking should be at relatively low levels in a crisis, at least for group decision-making, which is the subject of this analysis.

Proposition 70. As information load increases to an optimal point, the degree to which decisions are integrated increases, and then decreases beyond that point.

In a number of studies, Streufert and his associates have tried to categorize the content of decisions in terms of how they relate to other decisions in a series of choices designed to solve a policy problem. They conceive of three types of decisions (Streufert, 1969). An integrated decision is one that has a strategic relationship to other decisions that had been planned when the first of two related decisions was made. That is, an integrated decision is tied in with other decisions to form a strategy for handling a particular situation. Streufert and his associates consider this the most desirable kind of decision-making. A retaliatory or respondent decision is one that has an informative antecedent (the receipt of a message) but has no strategic relationship to decisions made before or after it. These decisions are responses to the actions of the other party. Finally, a general unintegrated decision is one that is neither part of a strategic sequence nor made in response to the actions of the other party.

As information load increases, integrated decision-making increases up to what earlier studies had indicated was an optimal information load (Streufert and Schroder, 1965:134; Streufert, Driver, and Haun, 1967:292). At the same time—that is, as information load increases to an optimal point—general unintegrated decisions (which are considered "undesirable") decrease. Past the optimal information load (10-12 bits of information per period), these trends reverse themselves. The number of integrated decisions decreases and the number of general unintegrated decisions increases. Thus decision-making becomes less effective in situations of information overload. It should be noted that the number of simple retaliatory decisions does not follow this curvilinear pattern. Rather, these responses to the actions of the other party show a simple linear increase with increasing information load (Streufert, Driver, and Haun, 1967:292).

In part these relationships depend on the nature of the group responsible for making decisions. In these studies, groups were divided as being of either "simple" or "complex" conceptual structure. Groups which were complex were composed of persons whose perceptual concepts were multidimensional and integrated; these people had the capacity to generate more, and more diverse, rules for integrating information. Groups which were simple were composed of persons whose perceptual concepts were more unidimensional; these people generated less, and less diverse, rules for integrating information. For both groups, the highest number of integrated decisions (the most desirable decision-making) occurred at the point of optimal information load. However, the complex groups produced a larger number of integrated decisions than the simple groups, although their decisions were no more differentiated in terms of different decision categories (Streufert, 1969:501). Because of this, it can be said that groups composed of persons of complex conceptual structure produce somewhat better decisions than groups of persons of simple conceptual structure.

One of the gaps in the literature that has shown up throughout this report is the lack of research that attempts to specify the content of the alternatives that are chosen. We have only the risk-taking literature, and in this chapter the work of Streufert, *et al.*, on integrated vs. unintegrated decisions. Other research that deals with the choice of alternatives

tends to be much more general, focusing on the quality of the decision performance as measured by number of errors or other indicators. It is this type of research that is the subject of the remaining propositions in this chapter.

Proposition 71. The greater the information load, the worse the decision performance.

Lanzetta and Roby (1957:310, 313) have conducted a simulation in which subjects use incoming information to make adjustments in control instruments in an aircraft. Three-man groups performed the task of processing the information from the instruments, relaying the necessary information to individuals requiring it and executing the control adjustments based on relayed or directly available instrument readings. Their performance was measured in terms of the number of errors made in adjusting the flight controls. Two different information structures were used for the groups. In the "high autonomy" structure, all but one of the four necessary instrument readings were directly available to the group member responsible for making the decision. In the "low autonomy" structure, none of the necessary readings was available to him. Thus the amount of information transmission necessary differed in the two groups.

When a large amount of information has to be relayed, the study shows that decision performance deteriorates. But more critically, when a large amount of information has to be relayed from several different sources, there is a marked deterioration in performance. The more autonomous decision-making groups performed better than the less autonomous decision-making groups. The policy implication is that the decision-maker should be given as much of the necessary information as possible, so that the amount of information that has to be transmitted can be minimal.

The deterioration in performance was especially serious when incoming information changed rapidly in the simulation. The faster the rate of change, the greater the number of errors committed by both low autonomy and high autonomy groups. But it makes no difference whether this change in incoming information is predictable or not. In the experiment, information changes presented to the decision-making groups were either "random" or "predictable," but this made no difference in decision performance.

The conclusion of this study is that the limiting factor in the performance of groups is not their gross information capacity but their inability to set up an efficient system for detecting and communicating information changes. Lanzetta and Roby (1957:313) observe that:

> Communications problems may result from ignorance on the part of response agents as to when information bearing on their controls enters the group at some other station, and on the part of information-source persons as to the relevance of new information they receive. Detection difficulties may be a function of a response conflict generated by placing the individual in the dual role of response agent and information source.

Proposition 72. There is a curvilinear relationship between stress on the decision-making group and decision-making performance.

As one would expect from other propositions presented in this chapter and throughout the report, there is a negative and curvilinear relationship between crisis-induced stress and the decision-making performance of groups. Lanzetta (1955:48) was one of the first to study this behavior. As others have shown on the level of the individual, he found that performance improves from no-stress to mild-stress situations, indicating the motivating nature of moderate stress, and then declines in high-stress situations. Specifically, groups experiencing high stress are less task oriented and less forceful, assertive, and active in their attack on the task (Lanzetta, Haefner, Langham, and Axelrod, 1945:452). They are both less efficient and less adaptable in decision-making, and more variable in the effectiveness with which they cope with a problem.

One of the specific effects of intense stress on an organization is a contraction in the number of demands that will be responded to. In a crisis, the organization will react only to those demands that are considered of the highest priority (Drabek and Haas, 1969:233). For other problems, the organization will seek alternative means of responding. Members will encourage outsiders who are making low priority demands to handle those problems themselves and they will "expand" their organization by calling upon the resources of external organizations. One indication of this is that the number of communications with external organizations

increases in a crisis (Drabek and Haas, 1969:232). The longer the crisis goes on, the greater the consultation with persons outside the core decision-making body (Paige, 1972:305).

These research studies are supported by the general reviews of the stress literature. Holsti (1972a:12ff) concludes that there is a negative relationship between stress and performance, and Milburn (1972:264) points out that the relationship is negative but curvilinear, with stress negatively affecting group performance only after moderate levels.

In referring to decision performance we have been talking about the quality of the choice made in coping with the crisis situation. Though quality declines, it does not mean that the organization is breaking down in terms of the number of decisions made. On the contrary, the output of the organization increases. Both Drabek and Haas (1969:233) and Hermann (1972:206) agree that in a crisis the amount of decision-making—that is, the rate of task performance—increases substantially.

Proposition 73. The higher the task load, the poorer the decision-making performance of a group.

Using task load, a more specific variable than stress, researchers again find a negative effect on group performance. With one exception, they have reported a direct relationship rather than a curvilinear one.

Lanzetta and Roby (1956:101) conducted a simulation in which the decision-making groups had to deploy interceptor planes to defend three target areas. The task load they faced was either high (15 planes employed—9 enemy bombers, 6 friendly planes) or low (10 planes employed—6 enemy bombers, 4 friendly planes). The conclusion of their study is that high task load leads to poor performance, measured in terms of success in achieving the objective of the exercise (defending the target areas), and low task load leads to good performance. They do find, however, that learning takes place under high task load conditions. Performance improved with practice for groups faced with high task load, although strangely, it decreased with practice for groups with a low task load.

The negative relationship between task load and decision performance of the group is supported in the theoretical analysis of Korchin (1962:22) and the synthesis of the literature by Holsti (1972a:15) and Milburn (1972:264).

Another study refines this proposition by dividing task load into the two components of complexity of the task and time pressure. In a small group experiment, Pepinsky, Pepinsky, and Pavlik (1960:36, 37) subjected groups to high, medium, and low time pressure by varying information about the amount of time remaining for completion of the task. They presented either simple or complex tasks, complexity being defined by such parameters as number of operations required per task, amount of variety in the patterns needed to complete the task, and necessity for group coordination. Unfortunately the dependent variable is not the quality of the performance but the productivity, measured as the number of operations performed during a working session. For the time pressure component of task load, they find a negative relationship, but a curvilinear one. Productivity increases as time pressure goes to moderate levels, but then decreases as time pressure becomes high. But for task complexity, the research contradicts the proposition by finding a positive relationship. Group productivity was higher for complex tasks than for simple tasks.

Proposition 74. There is a curvilinear relationship between the failure content of feedback messages and the quality of decision-making.

We conclude this chapter with a proposition on the effects of feedback, one of only two such propositions in this report. Clearly researchers have not paid attention to what happens in a decision-making situation after a choice is made.

As reported in Proposition 70, Streufert (1969) categorizes the content of decisions as integrated (related to other decisions), general unintegrated (unrelated to other decisions and not taken in response to incoming information), and simple retaliatory (taken in response to incoming information from the other party). He considers integrated decisions to be the most desirable from the point of effectively coping with a problem.

As the failure content of feedback information increases from one failure message out of seven to four failure messages out of seven, the number of integrated decisions increases. Thus, with the negative feedback, decision-making improves. However, at the turning point of four failure messages, the effect is reversed and the number of integrated decisions decreases with increasing failure content. The effect of the feedback also shows up in the number of general unintegrated decisions, the least desirable type of decisions. These decrease with increasing failure content, but then begin to increase at the threshold level of four failure messages out of seven. Thus at high failure content, there is a deterioration in the quality of decision-making.

CHAPTER 8

THE EFFECTS OF GROUP STRUCTURE ON DECISION-MAKING PERFORMANCE

There has been a great deal written, particularly in the literature of public administration, describing the organization of decision-making groups: the task structure, lines of communication, authority, distribution, level of individual input, and so on. One of the problems with much of this literature is that it is merely descriptive and not tied to output. That is, the authors do not examine the effects of group structure on the performance of decision-making tasks, at least not in a systematic way. In this chapter we look at the studies of this relationship that have used social science methodology.

One of the questions we have not examined is the basic one of whether to use a group at all for crisis decision-making. It is plausible that an individual could assume or be assigned the responsibility of crisis decision-making. One's initial impression is that a group is necessary simply because there are so many tasks to be performed. But the question can be decided empirically, and it is always the better part of scholarly discretion to treat these kinds of statements as empirical questions. For this particular question, we can be a little more sophisticated and ask the more interesting question: What tasks are best handled by the group and what tasks are best handled by individuals? The next propositions address this question.

Proposition 75. The greater the reliance on group problem-solving processes, the greater the consideration of alternatives.

In comparisons of situations in which individuals have had the sole responsibility of generating alternatives as opposed to those in which groups have been tasked with generating alternatives, it has been found that there is a wider range of options proposed in the

group situation (Paige, 1972:51). At the stage of a search for alternatives, there is no substitute for the wide variety of perspectives that various group members bring to the task.

However, the group can be more or less productive in generating alternatives depending on a number of factors (Torrance, 1957:315-317). First of all, the less status and power an individual has relative to other members of the group, the less willing he is to propose alternatives, even if he has the correct solution to the problem at hand. Second, this factor of relative status interacts with the manner in which the group leader obtains individual judgments to affect the range of judgment expressed. If opinions are solicited first from low status individuals, the number of alternatives proposed is greatest. Third, these low status members are more willing to express disagreement with proposals in *ad hoc* decision-making groups than in permanent ones. Apparently these individuals perceive themselves to have less at stake in groups in which their participation is only temporary. Finally, the amount of conflict in a group affects the range of alternatives that will be proposed. The greater the group conflict, the greater the consideration of alternatives. At the search stage of decision-making, then, disagreement within the group should be encouraged.

Proposition 76. Decision-making by groups leads to a greater tendency to choose a risky alternative than decision-making by individuals.

In a series of experiments, it is the general conclusion that groups are likely to engage in more risk-taking behavior than individuals (Wallach, Kogan, and Bem, 1964:271; 1962:80). The authors explain this finding in terms of a process of "responsibility diffusion" in which individuals are more likely to support risky alternatives when they know that the consequences of those alternatives will be shared by the group as a whole.

These findings are refined in a later study (Bem, Wallach, and Kogan, 1965:458). They show that the greatest shift towards taking risks occurred in contexts in which the group had to decide unanimously. The next greatest shift occurred where individuals made the decision, but after group discussion. There was little shift toward either greater or lesser

risk-taking when a decision was made by an individual anticipating later public disclosure of his decision. Finally, there were shifts in the conservative direction (toward less risky alternatives) in decision contexts in which decisions were made by individuals but the group experienced the consequences, and even greater conservative shifts when the individual made the decision but it was expected that the group would later attempt to reach a consensus.

It should be noted that disagreement should be encouraged at this stage in decision-making if there is a high value placed on taking calculated risks. The greater the group disagreement resulting from participation and tolerated divergence of expressed judgment, the greater the willingness of the group to take calculated risks (Torrance, 1957:316).

Given the propositions that decision-making by groups, at least for certain tasks, seems to be superior, the next question to ask is what kind of group should be set up to handle the crisis. That is, how do different group structures affect the performance of decision-making tasks? We deal with this question in the next propositions.

Proposition 77. Established groups produce better alternatives than *ad hoc* groups, regardless of the level of conflict in the group.

In several different respects, decision-making by groups that are permanent is superior to decision-making by groups that are brought together for a particular problem and then disbanded (Hall and Williams, 1966:216-219). First, when there is conflict within the group over solutions to the problem, the established groups react with increased creativity. That is, they generate new proposals. *Ad hoc* groups, on the other hand, react to conflict by compromise. That is, they modify existing proposals in an effort to reach agreement. Second, established groups utilize group resources to generate alternatives out of the group discussion that are more accurate than alternatives generated by *ad hoc* groups. This accuracy does not change with the level of group conflict. That is, the accuracy of solutions emerging out of a discussion in an established group does not change from low to high conflict situations, whereas accuracy does change substantially for the worse in *ad hoc* groups in high conflict. Finally, from an overall perspective, established groups make less

decision errors than *ad hoc* groups. And when there is high conflict, the accuracy of the decisions of established groups actually improves to a substantial degree, while that for *ad hoc* groups slightly declines.

These are important and interesting findings. There is a tendency for decision-makers to put together an *ad hoc* group in a crisis. This proposition suggests that greater consideration ought to be given to a permanent crisis management group.

Proposition 78. The initial decision performance on complex problems is better for loosely structured groups than for tightly structured groups.

Carzo (1963:463) divided his experimental groups into two structures. In the tight structure, members were separated from each other and allowed to communicate in writing only and only through the chain of command defined by the organization chart. In the loose structure, members were not separated from each other and were allowed to communicate with any other member either in writing (loose written structure) or verbally (loose-oral structure). Decision performance was measured in terms of the time required to make a decision, the costs of that decision, and the number of errors made in the process.

Carzo finds that the initial decision performance is better for the loosely structured groups than for the tight groups. However, over time—i.e., with practice—the tight groups catch up and in the end there is no significant difference between tight and loose groups. This suggests that if a crisis group is *ad hoc* (that is, it does not have any practice), then it should be loosely structured because these groups perform better initially. Another implication is that in the beginning of a crisis, the decision-making group should be loosely structured for better performance; as time increases, however, the structure can be tightened because there is no difference in performance between the two structures as the groups gain experience in handling the problem.

Proposition 79. The effects of a vertical structure vs. a horizontal structure depend on the task load.

Another way of structuring the group is to divide responsibilities either vertically or horizontally. In the vertical structure, the functions to be performed are subdivided. In the horizontal structure, the task is subdivided. Lanzetta and Roby (1956:101-102) have examined the effects of these two structures. In the vertical structure, each three-man group had to deal with the task of defending all three targets in an aircraft control simulation. One group member (Observer) was assigned the responsibility of monitoring the "position report" input and making necessary moves on the intercept board. The second member (Calculator) had to identify whether aircraft were friendly or enemy and keep track of the fuel status of interceptor aircraft. The third member (Decision-maker) made all decisions on deployment of the interceptor force. In the horizontal structure, each member of the group was assigned the responsibility of defending one of the three targets. Thus each member had to perform each of the three functions listed under the vertical structure, but for only one target.

Overall, that is, without regard to the task load, groups in the horizontal structure performed better than groups in the vertical structure in the sense of achieving the objective of the simulation–defending the target areas. But the difference is not statistically significant in the analysis of Lanzetta and Roby. When the task load is considered, there is a modification. Horizontal structure produced superior decision performance under low task load conditions, but vertical structure produced superior performance under high task load conditions. Again, however, the difference is not statistically significant.

These findings suggest that in a crisis situation, the vertical structure should be used because this produces superior performance in high task load conditions. The research is inconclusive, however, and further study is needed on this important proposition.

Proposition 80. The greater the amount of information transmission necessary, the greater the number of errors made in decision-making.

When a decision-making group is set up to handle a crisis, the research suggests that it should be structured so as to minimize the amount of transmission of information necessary and the size of the communications system. The more the decision-maker has the information he needs at his disposal and does not have to depend on others for information the less likely it is that he will make errors in his choices. Conversely, when a larger proportion of information has to be relayed and, more critically, when a larger proportion of information has to be relayed from several different sources, the performance of the group deteriorates (Lanzetta and Roby, 1957:307-314). The explanation for this rests in part on the finding that the larger the information system, the less the per channel capacity for handling information (Miller, 1960:699). In the larger system (that is, when there is a large number of channels), there are more opportunities for loss of information. Also, the information system can be no faster than its slowest component, and there are more chances of being slowed down in the larger system.

The previous four propositions all dealt with the structuring of the group to manage foreign policy crises. One more proposition rounds out this chapter on the effects of group characteristics on decision-making. It concerns the instructions that are given to the group.

Proposition 81. Groups tend to function more effectively under instructions that emphasize speed of performance.

We have seen (Proposition 61) that the favorability of instructions given to the group has no effect on the member's participation in, and satisfaction with, the group. Favorability was defined as congruency in terms of a fast or slow decision leader, instructions to proceed slowly or quickly, and instructions that emphasize speed or quality. As before, there is a null finding here. The favorability of instructions has no effect on the decision-making effectiveness of a group, defined in terms of number of trials required to reach a

solution, the average error per trial, and the time required to reach a solution. However, one factor, when considered separately from the other two, does influence effectiveness. It is found that when instructions emphasize speed rather then quality, there is an improvement in group effectiveness (Dubno, 1963:278).

PART III

EVALUATION OF RESEARCH FINDINGS

INTRODUCTION

In Part III the work of the second phase of the project is reported. The main task of this phase was to evaluate the research literature. This analysis is presented in Chapters 9 and 10. A secondary task was to draw the implications of the findings for crisis management; this is the concern of Chapter 11.

In the second phase, we undertook an evaluation of the literature in order to determine:

1. those areas in which there is substantiated knowledge and we can safely assume the validity and transferability to crisis management of what the research tells us; in these areas we can proceed to suggestions of ways in which crisis management might be improved by taking this research into account;

2. those areas in which relationships have either not been studied at all or have been studied incompletely so that there is insufficient and/or contradictory support; relationships judged important for crisis management will be recommended for further research.

Chapter 9 summarizes the results of the first of these Phase II tasks, while Chapter 10 focuses on the second. Together these two chapters constitute HSR's analysis of the state of the art in applying psychological and sociological research to crisis management decision-making.

Our evaluation in these chapters is based upon three criteria that allow us to differentiate between relationships that are supported and those that are not supported by the research. These are:

1. the relationship is supported by two or more research studies;

2. the research is valid from a methodological standpoint;

3. the relationship has been studied in the context of "real-world" decision-making or seems intuitively applicable to "real-world" situations.

We have been flexible in applying these criteria to take into account our professional judgment of the literature. For example, if a relationship has only been supported by one study but it is an excellent simulation of decision-making and it seems directly applicable to crisis management, then we have included it in Chapter 9 as a substantiated finding. Conversely, relationships which have been supported by the experimental literature but whose transferability to crisis management is not apparent without further research are included in Chapter 10 as unsubstantiated findings.

In general the purpose of our project has been to present statements of relationships that summarize the findings of the research literature. It has not been our purpose to make recommendations based on the research findings. However, because policy recommendations often emerge rather obviously in the literature, and because the problem of applying research to crisis management has been the underlying concern of and rationale for this project, we have devoted some time to deriving the prescriptive implications of the propositions. These are presented in Chapter 11. Recommendations that are made are stated in general rather than specific terms. Thus these recommendations are not directly "implementable." However, we feel that these statements highlight the areas in which the research findings have important implications for the improvement of crisis management.

CHAPTER 9

AREAS OF SUBSTANTIATED RESEARCH

The relationships that are supported by the research literature are presented as answers to a series of questions. These are grouped into two areas which correspond to the first two parts of this report: improving individual decision behavior and improving group decision behavior. In this way we think we can best relate research knowledge to the problems of crisis managers.

I. Improving Individual Decision Behavior

1. How does stress affect the creativity of an individual's analytical abilities?

Stress leads to conceptual rigidity. The conceptual sets which an individual brings to bear in a situation become rigid in the face of incompatible cues from the environment. New conceptual sets are not created to handle the new situation. Rather, a previously dominant goals-means value complex persists and guides responses, even when those responses prove ineffective. With this kind of conceptual rigidity, the individual tends to repeat responses formulated for other situations, to the exclusion of new alternatives.

In addition, stress leads to a loss in the complexity of cognitive processes. The ability to think abstractly breaks down: such things as the ability to categorize, the ability to shift from one concept to another, and the ability to sustain several tasks simultaneously and to synthesize them into a single action are adversely affected. The person begins to think in zero-sum terms: either I-win-you-lose or I-lose-you-win. An important example of this breakdown in complex thinking is the research finding that the individual decision-maker in a crisis is not able to perceive differences in the target of a threat; it was found that individuals do not distinguish between the nation, the organization of which he is a member, and his own person as the target of a threat.

Generally, therefore, there is a decrease in productive thought and an increase in non-productive thought. There is less productive behavior such as "diagnosis of the situation," "interpretation," and "initiating" (creative) behavior, and more non-productive behavior such

as "general discussion of the task." At precisely the time (a crisis) that creative thought is most needed, there is a breakdown in the creativity of analytical abilities.

2. How does stress affect perception?

The greater the stress, the greater the likelihood that the perceptions of the environment made by individuals will be distorted. There will be premature interpretations of stimuli and nonsensical interpretations of stimuli. There is an impaired ability to select the correct percepts from a complex environment. Particularly important in situations of crisis is the impairment of the ability to distinguish the dangerous from the trivial, a distortion in the perception of what is important in a situation.

In addition, the complexity of perception breaks down under stress. Fewer elements in the environment will be perceived. Of those that are perceived, there will be a failure to perceive variations among them. That is, the individual fails to make important distinctions between stimuli.

Part of this problem of distorted perception can be attributed to the conceptual rigidity of an individual that occurs in a stressful situation. (This was discussed in No. 1, above.) Because the incoming information of the crisis situation does not fit into the inflexible conceptual sets of the individual, he begins to "select out" new information. This becomes a dangerous circular process: because of conceptual rigidity, he begins to select out new information, and then this new information is not available to challenge existing conceptual sets.

One of the most important aspects of perceptual distortion is distortion in the perception of time. In a crisis, individuals perceive time as passing faster than it actually is. In a crisis the time available to make a decision is short anyway, and the pressure of distorted time perception aggravates this problem.

3. Does crisis affect the ability of the individual to define a threat?

An event that occurs in the environment may or may not be seen as threatening, and of course, whether or not it is will determine whether or not a situation is perceived as a crisis. There has been little research in this important area, but a couple of questions have been addressed.

An event can be seen as a threat to an individual in the role that he occupies, or it can be seen as a threat to the organization of which he is a member, or it can be seen as a threat to the entire nation. Only the latter should be considered a foreign policy crisis. The problem is that individuals tend not to perceive differences in the target of a threat. That is, they do not distinguish between threats to oneself, to the organization, and to the nation. The consequence may be an inappropriate response.

Obviously, the nature of the goal that is threatened is important in defining a threat. When an individual is highly motivated to achieve a goal, he is more likely to perceive that goal as threatened when potentially threatening stimuli are directed toward it. Here again there is the danger of an inappropriate response. An individual may be highly motivated to achieve a goal, but his motivation may be for reasons other than national security. If an event occurs that threatens that goal, he may perceive that situation as a crisis when in the perspective of national security it is not.

4. What effect does crisis have on the analysis of policy alternatives?

In a crisis situation, decision-makers become too pressured to discriminate between alternatives. The analysis of alternatives becomes crude: that is, important differences among alternatives are glossed over, so that only a few distinctions are made. For those alternatives considered, the decision-maker under stress is limited in his ability to estimate the range of possible consequences. There is a predominant concern for the present and immediate future at the sacrifice of attention to longer-range considerations. This is of course aggravated by the deterioration, discussed above, in the analytical abilities of the individual.

The result of all this—well supported in the literature—is a tendency of decision-makers under stress to make a premature choice of alternatives before adequate information is available for a correct response.

The relationship is not quite as simple as it seems. To some extent stress is a motivating factor that improves decision performance. Studies find that as stress increases to moderate levels, the choice of policy alternatives improves. It is only at high levels of

stress that the analysis of alternatives begins to break down and incorrect responses result. It should be noted, however, that crisis involves high stress levels.

The amount of time available is an important intervening factor here. Time pressure leads to poorer choices of alternatives. The time pressure increases in one of two ways. Either the time available in which to make a decision decreases or the number of decisions that has to be made in a given amount of time increases. In either case there is increased time pressure, and the analysis of alternatives suffers.

5. **How does crisis affect the risk content of the alternatives that are chosen?**

The greater the stress, the greater the likelihood that a decision-maker will choose a risky alternative. This tendency to choose a risky alternative increases with continued participation in a decision-making task. That is, as the time passes in a crisis, the individual becomes more likely to choose a risky alternative.

This increase in risk-taking behavior occurs regardless of the type of feedback the decision-maker is receiving from the environment. For situations in which incoming information indicates increasing success and for situations in which incoming information indicates increasing failure, the tendency to choose a risky alternative increases with continued participation in a decision-making task. It should be noted, however, that crisis situations may not involve this continued participation. If a crisis is short, the research indicates that risk-taking will be lower.

The amount of information with which an individual has to cope also affects risk-taking behavior. There is a curvilinear relationship between information load and the tendency to choose a risky alternative. As information load increases to an optimal point at ten to twelve bits of information per decision period, the tendency to choose a risky alternative increases to its highest. Beyond this information load, risk-taking decreases. This again may be a factor that tends to keep down the amount of risk taking in crisis situations. If there is an information overload in crisis, the research predicts that the tendency to choose a risky alternative will be reduced.

Personality characteristics also affect risk-taking behavior. "Internally controlled" individuals are those who attempt to maintain control of their environment even in chance-dominated situations by cautious and planned selection of probabilities. These people who perceive themselves as having control over their environments are less likely to choose risky alternatives.

Finally, the research shows that the individual is more likely to choose risky alternatives if he can make his decision in the context of a group situation. As the result of a process of "responsibility diffusion," individuals are more likely to support risky alternatives when they know that the consequences of those alternatives will be shared by the group as a whole.

6. What types of maladaptive emotional responses occur in crisis situations?

In this area the answers that the research provides are tentative. The reason is not that there is an inadequate amount of study, or that the results are ambiguous. The problem here is one of the validity of the measures. Psychological tests that measure emotional responses in the laboratory may not be valid indicators of the behavior of foreign policy decision-makers. But the research results are included here because the area of maladaptive emotional responses was thought to be an important one for crisis management.

As the intensity of the threat increases and the decision time to cope with it decreases, there is an increase in anxiety, fear, frustration, hostility, and tension. Decision-makers do not remain "cool" under the pressure of a crisis. These negative reactions lead to aggression and escape behaviors, which are maladaptive attempts to avoid the task. They interfere with perceptual processes, that is, with the ability of the individual to select the relevant percepts from the environment and order them in a coherent image.

The psychological problems of an individual may be aggravated under stress. That is, negative behaviors are reinforced. A "repressor" tends to repress more. An "anxious prone" individual tends to express more anxiety. Anxiety is manifested in such behaviors as confusion,

feelings of unreality, depression, and fatigue. Obviously, such symptoms can be important obstacles blocking rational decision-making.

7. What part does fatigue play in reacting to a crisis?

Fatigue results from two factors. First, it is the result of simple physical exertion: the amount of hours spent by an individual in participating in crisis decision-making is much greater than his normal work load. Secondly, fatigue is the result of stress. Working under the pressure of the crisis situation leads to greater fatigue than would result from the same number of hours in a non-crisis task.

The question is: What are the results of fatigue? Does decision-making performance deteriorate as both the stress of the situation and the number of hours increase the individual's fatigue? Here is an area where more research is needed. Scholars have not taken the step of tying fatigue to its effect on various tasks of the decision-making process. One would want to know whether some tasks are affected more than others so plans could be made for replacing personnel in those areas where performance is likely to suffer most as the result of fatigue.

II. Improving Group Decision Behavior

1. Why is early diagnosis of a crisis necessary?

A great deal of the research shows that when decision-making takes place under time pressure, performance deteriorates. The general conclusion that can be made is that any action that can be taken to increase the amount of time available for decision is beneficial. One of the most crucial tasks, then, is to insure that the crisis or potential crisis is diagnosed as early as possible.

Part of the problem here is the task of generating alternatives. It makes sense, and research shows, that the greater the time pressure in a crisis, the smaller the number of alternatives that will be considered. Research also shows that the greater the time pressure, the poorer or more incorrect the choices of alternatives. Both of these findings indicate that effective crisis management requires an early warning system that recognizes potential crises and puts into effect the process of considering alternatives.

2. Why are established crisis management groups preferred to groups that are put together *ad hoc* for a specific crisis?

Established groups perform better than *ad hoc* groups in the sense that they produce better alternative solutions for the problem. When there is conflict within the group over solutions, the established group reacts with increased creativity—that is, new alternatives are proposed. *Ad hoc* groups react to conflict with compromise—the watering down of existing alternatives until they become acceptable to those concerned. Established groups utilize group resources to generate alternatives that are more accurate in terms of solving the problem than those generated by *ad hoc* groups. When there is high conflict, the accuracy of the decisions of established groups actually improves to a substantial degree, while that for *ad hoc* groups slightly declines.

Research also shows that experience with a task improves the decision-making behaviors of individuals. With greater experience, there is an increase in the individual's tolerance for ambiguity. The benefit here is that the greater one's tolerance for ambiguity, the greater the likelihood that one will not make a response to a stimulus before adequate information is available for a correct response.

Much of the research points to the need for improvement in the consideration of alternatives. This suggests that there should be contingency planning for crisis situations, and contingency planning requires an ongoing organization that can formulate those plans, constantly review and update them, and be familiar enough with them so that in a crisis the members know how they can be applied and what their limitations are.

3. How should the decision-making group be structured?

Before discussing some specific structural characteristics of the group, we should make an observation about the general problem of whether a group or an individual should be responsible for crisis decision-making. The answer is that at least in the task of proposing and analyzing policy alternatives for the problem, the group performs better than the individual. There is no substitute for the wide variety of perspectives that various group members bring to the task of generating alternatives.

One of the options in organizing a group for decision-making is a tight structure vs. a loose structure. In the tight structure, members are separated from each other and

allowed to communicate in writing only, and only through the chain of command defined by the organization chart. In the loose structure, members are not separated from each other and are allowed to communicate with any other member either in writing or verbally. Research shows that the initial decision performance on complex problems is better for loosely structured groups than for tightly structured groups. Over time, however, this does not hold: the tightly structured groups catch up to the performance level of the loosely structured groups. The implication is that, at least in the initial stages of a crisis, it is preferable to have a loosely structured group.

Another way of structuring the group is to divide responsibilities either vertically or horizontally. In the vertical structure, the functions to be performed are subdivided. That is, each member of the group performs a different function for the entire task. In the horizontal structure, the task to be undertaken is subdivided. That is, each member performs all functions but for only part of the task. Overall—that is, without regard to the task load—groups in the horizontal structure perform better than groups in the vertical structure. However, when the variable of task load is introduced, there is a modification. Horizontal structure produces superior decision performance under low task load conditions, but vertical structure produces superior performance under high task load conditions. In a crisis situation, then, which is a condition of high task load, the vertical structure should be implemented.

How should information be distributed in a group? Information distribution can be either "general" or "special." General information represents the range of possible experience in the decision-maker's environment; the general information available to a decision-maker overlaps that possessed by other members of the group. In contrast, special or specific information is exhaustive concerning one of the elements of the decision situation. Each member of the group has information specific to a different element of the environment. Research indicates that groups provided with general, shared information almost always make better decisions.

4. Does crisis involve special leadership needs?

In a crisis situation, there is a greater need for effective leadership than in a non-crisis situation. Leadership is needed not only to direct the management of the crisis,

but also to handle the interpersonal relationships in the decision-making group. As the length of the crisis increases, there is greater conflict within the organization and a consequently greater investment of emotional affect in policy and personal differences. An effective leader is needed to resolve these interpersonal differences and insure that the group concentrates on the task.

This last paragraph suggests two functions for leadership—one to direct the task of solving the crisis problem and one to manage the dynamics of the group. These two roles have been called task leadership and emotional affect leadership. Task leaders have the most influence in ideas on solving the group's environmental problems—that is, the crisis itself. Socio-emotional leaders have the most influence in helping group members handle their emotions and thus in maintaining group cohesion. In crisis, research shows that these two roles become sharply differentiated. Whereas in non-crisis an individual might function in both roles, in a crisis he concentrates on only one. Those who are primarily human relations oriented (the socio-emotional role) will pay less attention to the task and more attention to the human relations aspects of group interaction, while those who are primarily task-oriented will become much more so in a crisis and totally neglect human relations. This suggests that a crisis requires two different individuals to fill these leadership requirements.

One or the other of these leadership roles will be more important to effective decision-making performance depending on the type of decision situation. If the situation is very favorable or very unfavorable in terms of leader-member relations (how well the leader and his subordinates get along), task structure (how well defined and clear is the task and its method of accomplishment), and position power (how much power is available to the leader over his subordinates), then leadership that is task-oriented produces effective group performance. If the situation is of intermediate favorability in terms of these three criteria, then leadership that is relationship-oriented produces effective group performance.

5. What is the effect of stress on group decision-making behavior?

Research in this area shows findings that are similar to those for the same question on individual decision-making behavior. There is a curvilinear relationship between stress and group decision performance. As stress rises to moderate levels, there is an improvement in performance. Beyond a threshold point, however, group performance deteriorates as stress reaches high levels.

More specifically, this manifests itself in the analysis of alternatives. Under stress, fewer alternatives will be generated in attempts to reach a solution to the crisis. The creativity of those that are generated will be limited in situations of high stress. Groups experiencing high stress or less task oriented and less forceful, assertive, and active in their attack on the task. They are less efficient and less adaptable, and fail to meet a number of the demands that are made on them. Only demands considered to be of the highest priority will be responded to.

6. How does group conflict affect decision-making performance?

In a crisis situation, conflict within the decision-making group increases. One major reason, of course, is that a crisis is a situation of high threat, so the stakes for the participants are raised. From their different perspectives, the participants bring different interpretations to the events and advocate different alternatives, thus creating conflict. This tension is aggravated by the time pressure under which the members are working.

Group conflict, provided it is triggered by disagreements about the task and not disagreements about personalities, has positive effects on decision-making performance. Groups experiencing conflict more frequently employ creative alternatives than groups without conflict. Their overall performance, in terms of the adequacy of the alternatives they generate in solving the crisis problem, is higher than groups without conflict. In addition, there is likely to be a greater consensus among group members after conflict once the final decision is reached. Apparently, once all group members have participated in the decision-making and expressed their various preferences, they are more willing to accept the decision of the group.

There is a problem, however, if group members are not all of equal status and power. Group members of lower status and power tend to resist accepting the final decisions of the group. Since these disadvantaged members usually participate less and are less willing to disagree or otherwise influence the group's decisions, even if they have the correct solution, they may themselves be less influenced by the group, have less stake in the group, and therefore feel no need to concur in the decision.

One general conclusion from the research is important. Conflict should be encouraged in the search for and analysis of alternatives. It is in this task that conflict is most functional. However, when the task is that of choosing among the alternatives proposed, then conflict becomes dysfunctional, and decision-making by an individual becomes desirable.

7. What are the effects of a crisis on an organization's information-processing capacities?

In a crisis, there is an increased load on the communications system. Information load is the result of two factors. It depends on the volume of information incoming from the environment and the number of communications channels available to handle that information. If either the volume goes up, or the number of channels decreases, while the other remains the same, the information load will increase. In crisis, the literature shows that both of these things happen. The result, of course, is that it is that much harder to make effective decisions when the information necessary to make those decisions is not being adequately processed.

It has been found that as the information load increases, there is a greater tendency to rely upon extraordinary, *ad hoc* channels of communication. This is one of the ways in which decision-makers adapt to the difficulties of information-processing in a crisis. They bypass both the effects of information overload and the distortion of content in transmission by new channels of communication such as direct contact with heads of other governments.

In a crisis there will also be a much greater amount of internal communications than normal. There is greater consultation within the organization before decisions are made, and consequently there is a need for someone or something to function in the role of a display mechanism that facilitates the sharing of information. In many cases, the limiting factor in an organization's internal communications system is not the information load but the inability to share information and get the right information to the right individuals.

Having found that crisis creates these information-processing problems for the organization, we must ask the follow-up question: what is the effect of these problems on the performance of decision-making tasks?

8. **How does information load affect decision-making?**

As the load on the communications system in a crisis increases, the search for information becomes less thorough and selectivity of attention becomes more important. Selective attention is employed by an organization as a method of coping with overwhelming amounts of information. This selectivity of attention functions to effectively cut down the amount of information to be handled. By limiting the search to certain types of information, the organization cuts down on its volume, but this is at a time when maximum information is needed for the best performance. What is particularly important is that new types of information get "selected out," thus reinforcing old ideas and failing to give decision-makers cues to new and developing situations. This tendency to respond only to recognizable information becomes one of the severe limiting factors in formulating an appropriate response to the crisis.

As information load increases to an optimal point, the degree to which decisions are integrated increases, and then decreases beyond that point. Integrated decision-making refers to decisions that have a strategic relationship to other decisions that is planned when the first of two related decisions is made. That is, an integrated decision is tied in with other decisions to form a strategy for handling a particular situation, as opposed to a decision that is not tied to others or is simply a reaction to environmental inputs. In this respect, decision-making becomes less effective in a crisis situation.

Particularly where incoming information is from several sources and information must be relayed, decision performance deteriorates as information load increases. This suggests that the decision-maker should be directly given as much information as possible so that the need for information transmission within the organization can be minimized. This deterioration in decision performance is especially true in situations of rapidly changing information. Research suggests that the limiting factor in the performance of the group is not the gross information capacity but the inability to set up an efficient system for detecting and communicating information changes.

The overall conclusion is that the greater the amount of information transmission necessary within an organization in a crisis situation, the greater the number of errors made in decision-making. The more the individual decision-maker has the information he needs at his disposal and does not have to depend on others for information, the less likely it is that he will make errors in his choices.

CHAPTER 10

REQUIREMENTS FOR FUTURE RESEARCH

The research topics covered in this chapter have been judged important enough for crisis management that further research is warranted. They are areas in which relationships have either not been studied at all or have been studied incompletely so that there is insufficient and/or contradictory support. (The criteria on which these judgments are based are presented in the Introduction to Part III.) As in the previous chapter, the research topics are grouped into two areas which correspond to Parts I and II of this Report: improving individual decision behavior and improving group decision behavior.

I. Improving Individual Decision Behavior

Factors Leading to Premature Response

One of the most frequently reported and one of the most debilitating behaviors in a crisis is the tendency to respond prematurely to an event, before adequate information is received and/or adequate analysis is conducted. While the behavior itself is well documented, we do not know the range of factors that contributes to it. We know in general that as stress increases, the decision-maker feels pressured to come to a decision quickly. Partly this is a function of time pressure. In a crisis the individual's perceptions of time are distorted in the direction of overestimating the amount of time that has passed; consequently he makes decisions before they are actually necessary. There is some evidence that an individual who cannot tolerate the ambiguity of the information he is receiving about the environment tends to formulate a premature response. But this latter finding is not well documented. Apart from distorted perceptions of time, therefore, we know little about the causes of premature response. Research is needed to identify other variables that play a role and to determine their relative influence.

Effects of Loss in Complexity of Cognitive Processes on Decision-Making

The research literature supports the negative effects of stress on the complexity of an individual's cognitive processes: a loss in the ability to categorize, to shift from one concept to another, and to sustain several tasks simultaneously and to synthesize them into a single action, and a disruption of complex learning. All of the research, however, has been conducted in the laboratory. It is not clear that the indicators of cognitive complexity are valid measures of the intellectual functions of the individual in the real world. Nor has there been any analysis of whether foreign policy officials—intelligent, experienced, cool-headed individuals—are subject to such losses of cognitive abilities.

Another aspect of this question must be examined. Even if it is established that foreign policy decision-makers are subject to the negative effects of stress on cognitive complexity, it still must be determined what the impact of this is on the effectiveness of decision-making. That is, if we establish the proposition that increased stress leads to a breakdown in cognitive complexity, we must then show how the breakdown in cognitive complexity affects the performance of various decision-making tasks. Also, it is important to research the question of the impact of this intellectual variable relative to the impact of other independent variables.

Establishing the Stress Threshold

A great deal of research points to the curvilinear relationship between stress and decision-making performance. For example, Proposition 8 states that as stress increases to moderate levels, perceptual accuracy increases; beyond a threshold point, perception becomes distorted. Proposition 26 posits a similar kind of relationship between stress and individual decision-making performance, and Propositions 67, 70 and 72 point out the curvilinear relationship for various measures of group performance.

The implication is that stress should actually be encouraged up to its threshold point, as this will stimulate improved performance, but should not be allowed to go beyond that point. The problem, of course, is that we do not know, have not been able to measure,

the threshold point at which stress changes from moderate to high levels. Because so much research points to this curvilinear relationship of stress to several dependent variables, we think this is an important subject for future research.

Perceptions of Risk in the Environment

In a simulation reported in Proposition 12, it is found that from the first to the last of five trials, the amount of risk perceived by the subjects decreased significantly, while the objective level of risk was held constant. The implication is that other variables affect the amount of risk perceived besides the objective level of risk, one of them being the amount of time spent on a task. This is an important finding, for it reflects on the ability of the decision-maker to define the situation facing him. The finding indicates that as time passes his definition of the situation becomes less and less realistic. This study of the effect of time spent on the task needs to be replicated, and research must also consider other variables that may affect perception of risk.

Ability to Define Threat

When will an event in the environment be interpreted by participants as a threat to their goals? That is, when is an event considered to be a crisis? This kind of problem, related to the previous one, is crucially important both in terms of determining what events constitute a crisis and in providing for early diagnosis that a crisis is imminent.

All of the factors that affect this behavior must be studied. However, one relationship that we have found is that the individual has difficulty in separating out threats to his own goals and threats to the goals of his organization from threats to the goals of the nation. This hypothesis, with its important implications for accurate diagnosis and appropriate response, is confirmed in one study for Proposition 13, but further research is warranted.

Maladaptive Emotional Responses

The problem here is not one of establishing the validity of the proposition that stress leads to maladaptive emotional responses–fear, aggression, anxiety, etc. Psychological experiments show quite clearly that this is the case. The problem is that psychological tests that measure emotional responses in the laboratory may not be valid indicators of the behavior of foreign policy decision-makers. We have no "real-world" analysis of the extent to which decision-makers are subject to the various affective variables. Even if we assume that they are, there is the further important question of the impact of these variables on decision-making. It is a difficult theoretical problem to link the maladaptive emotional responses of an individual to stress with the decision output of a foreign policy apparatus. Furthermore, even if the link is established, there is the question of what can be done to correct the situation. The variable of maladaptive emotional responses may largely be beyond the control of crisis managers.

The Effects of Fatigue

A question similar to the previous one arises in considering fatigue in the crisis management situation. Although we know that fatigue increases as both the stress of the situation and the number of hours increase, we are not sure of the effects of fatigue on decision-making performance. Specifically, we should study which particular decision-making tasks are most subject to the negative effects of fatigue. It would be in these areas that crisis managers would want to consider the regular replacement of personnel. Obviously, however, this is complicated by both a lack of personnel and the indispensability of certain individuals.

Effect of the Decision-Maker's Experience

Taylor (1972) has conducted a simulation in which he analyzes the impact of an individual's experience, as well as several other independent variables, on aspects of decision-making behavior. His simulation is of a personnel decision in business management. The

findings are interesting ones that have implications for the selection of individuals who are responsible for crisis management. A replication of the research in the context of crisis management is warranted.

The propositions that should be analyzed are as follows: The amount of experience a decision-maker has is related to his mode of processing information about a decision (Proposition 29). Such things as amount of information acquired, retention of information items, and ordering the value of information items are affected. The greater the supervisory experience of an individual, the more rapidly will he make decisions (Proposition 32). However, this tendency is modified by the increasing age of the decision-maker. The greater the experience of an individual, the more accurate are his decisions (Proposition 37). Finally, the older a decision-maker and the more supervisory experience he has, the less confidence he shows in a decision he has made and the more willing he is to change his decision when faced with new and contradictory information (Proposition 41).

This latter proposition is important because, if verified, it begins to settle a contradiction between two bits of conventional wisdom about a decision-maker's orientation toward his decisions. One piece of conventional wisdom is that as a person mellows in his role, he becomes more appreciative of the complexities of the situation facing him and less sure that there are stock answers to the problems. He is, consequently, less confident and more flexible in his decision-making. The other piece of conventional wisdom is that as a person stays in a role, he becomes set in his ways and committed to certain positions. Thus he is more confident in the decisions he makes and less flexible in changing them. The finding from Taylor's simulation supports the first interpretation. If supported by research in the context of government decision-making, it suggests that as bureaucrats gain experience, they become better decision-makers. On this basis the recommendation could be made that crisis management teams be staffed with the most experienced individuals.

Decision-Making Style

Under the loose term of decision-making "style," we include the variables of proneness to take risks, dogmatism—the extent to which an individual's value system is

open or closed—and the degree to which an individual perceives himself to be in control of his environment. These factors are important for their effects on decision-making behavior. Whether or not further research should be conducted in order to validate propositions depends on the degree to which the variables are considered controllable. If the effects of these variables are considered important enough so that crisis managers are screened in the selection process for the degree of risk-proneness, dogmatism, and perceived control over environment, then further research is warranted. If such screening is not to take place, or the effects of the variables are not to be controlled in other ways such as training, then the research need not be pursued.

The propositions concerning risk-proneness and dogmatism are derived from Taylor's simulation of a business management decision. The more prone a decision-maker is to take risks, the less information will be used by him in decision-making, and the more rapidly will he make decisions (Propositions 30 and 31). The more dogmatic an individual, the more rapid is his decision-making, the more accurate are his decisions, and the more confident he is of his decisions after they are made (Propositions 33, 38, and 40). For perceived control over the environment, there is research on only one aspect of decision-making behavior: Decision-makers who perceive themselves as having control over their environment are less likely to choose risky alternatives (Proposition 35).

Feedback

We know virtually nothing about the effects of feedback on the behavior of individuals. This highly important topic has been ignored in the literature. Only two propositions could be derived from the literature. They are important ones that deserve replication; they also point to the type of questions that can and should be analyzed in this area. Research should determine whether an increase in feedback indicating success or an increase in feedback indicating failure has an impact on the tendency of decision-makers to choose risky alternatives (Proposition 42). And it should determine whether the content of feedback information affects the quality of decision-making (Proposition 74).

II. Improving Group Decision Behavior

Administrative Viability

There has been a great deal of research on the effects of stress on group performance. Much of this is presented in Part II in various propositions. Several limitations, however, lead us to propose that further study be conducted in this area. For reasons that will become clear below, we have divided this topic into two research areas—administrative viability and decision-making performance.

One deficiency with the research is that most of the propositions focus on a dependent variable that is rather vaguely stated as "group performance." Sometimes this refers to the ability of the group to handle the organizational problems of responding to a demand from the environment. At other times this term refers to decision-making—either various aspects of the process, such as the speed with which a decision is made, or the quality of the decision that is made.

In an effort to draw a distinction between these two general categories of the dependent variable, we suggest two areas for further research. One constitutes what Hermann (1963) calls "administrative viability"—the ability of the organization to mobilize itself to deal with the task at hand (Proposition 62). This concerns such things as the number of communication channels available for the collection and distribution of necessary information, the tendency for organizational units to withdraw from organization tasks, the amount of conflict within the organization, and the application of the standards which normally govern the operations of the organization. These are *administrative* kinds of concerns subject to stress which we are trying to differentiate from *decision-making* kinds of concerns subject to stress.

Decision-Making Performance

In contrast with the more general level of the ability of the organization to mobilize itself in times of crisis, the other level of suggested research in this area focuses on the specific decision-making activities that must be undertaken to solve the crisis. This includes all of the steps leading up to the choice of an alternative that is designed to respond to the crisis. We

suggest that future research be guided by a breakdown of the decision-making process into its components, such as definition of the situation, identification and ordering of goals, generation and analysis of alternatives, choice of alternative, implementation and monitoring of feedback. For each of these aspects, dependent variables should be generated that reflect very specific decision-making tasks. This would then be included in propositions that could be tested to yield a highly detailed model of the decision-making process. Because the dependent variables constitute specific tasks, this research would be highly policy relevant providing that the explanatory (independent) variables were subject to the crisis manager's control.

Research in both this and the previous area suffers from the deficiency that most of the analysis has focused on small groups, usually informal or *ad hoc*, in a laboratory setting. There has been little analysis of formal organizations in the context of the government bureaucracy, nor even much simulation that tries to replicate the conditions of a government organization. One model for future research should be the work of Drabek and Haas (1969a and 1969b), who constructed a realistic simulation of a police control center and conducted an experimental analysis of the organization's response to a stressful situation—in this case a community disaster. One suggested project is simply a replication of the Drabek and Haas study for a crisis management organization.

Size of the Group

We have found little research that attempts to analyze the impact of group size on the socio-psychological dynamics or the decision-making behavior of the group. There is some evidence that the size of the group is inversely related to the amount of influence the leader will have and to the amount of consensus that will be achieved through group discussion (Propositions 58 and 59). These are rather obvious relationships. Research is needed on the more interesting propositions involving size and such things as group conflict, information exchange, creativity of alternatives, and so on. Findings on these kinds of topics would be an important early consideration in establishing a group to handle crisis management.

Leadership Needs

In Chapter 9 it was pointed out that research has shown the need for two different leadership roles—task leadership and socio-emotional leadership. This requirement is an important one. It is, however, the only area concerning leadership in which there is substantiated knowledge.

It has been pointed out that a crisis situation requires effective leadership. This is not a very helpful statement. What would be more helpful is a series of statements that point out which aspects of crisis decision-making are most affected by the quality of leadership, and in which ways. Research should be able to show, for example, what the special leadership needs are in a crisis situation in the tasks of generating alternatives, coordinating group activities, reaching a consensus, and so on.

Since the group tasked with managing a crisis is often an informal organization where the leader is informally, rather than formally, designated, some interesting research questions arise on group dynamics. One of these is contained in Proposition 55, which deserves further analysis. It appears that in a non-crisis situation, the leader of the group remains dominant even if he does not solve the problem at hand. In a crisis situation, however, the group replaces an ineffective leader. The person originally second in influence becomes the leader, while the originally most influential person drops to second place.

Choice of Goal

There is virtually no research on the problem of choosing goals in either normal decision-making or decision-making under stress. No doubt this is true because the concept is difficult to define and difficult to measure. One problem, of course, is level of generality. "National security" is a goal, but it is expressed at such a general level that it becomes useless in accounting for policy choices. If goals are considered to be important elements in explanatory models of decision choices, then here is one of the major gaps in the literature.

We want to know if a goal is chosen at all by a crisis management group. We want to know if this choice is a conscious or unconscious one, and if the former, what the

process is of choosing the goal. We want to know if there is more than one goal, and if so, whether there is an implicit or explicit ordering of priorities. We want to know the extent to which goals guide the analysis and choice of alternatives, and would try to determine whether there is the problem of the available alternatives determining what goals will be adopted. Finally, we want to investigate the process by which goals change during a crisis situation. Proposition 21 indicates that as the amount of time decision-makers are under pressure to solve the problem increases, there are significant changes in goals. At times these may be functional, when goals are changed in response to a realistic appraisal of the situation. At other times this may be dysfunctional response to failure, as when the policy-maker changes his goal in order to provide a rationale for continuing an activity that is no longer an appropriate response.

Instructions and Decision Rule

In setting up a group to handle a crisis situation, procedural matters can have an impact on various aspects of decision-making. There are some indications, which need to be backed up by future research, that the issue of whether the group reaches the decisions for which it is responsible by unanimity or by majority rule affects the amount of information that is exchanged in group interactions, the ability of the group to reach an agreement, and the quality of the decision (Propositions 44 and 46). Similarly, we want to know the effects of the instructions given to the group concerning speed of performance, method of considering alternatives, authority relationships, and so on.

Information Requirements

The enormous question of information processing is of vital importance in crisis management. There are a good number of areas of substantiated knowledge, as Chapter 9 points out. In general these concern the effects of crisis on information load, and the effects of increased information load on decision-making behavior. There are a number of areas, however, that deserve further research.

One important question is: What are the requirements for the content of incoming information? What does the decision-maker need to know, and what can he dispense with under the pressure of short decision time? More specifically, what does each particular member of the crisis management team need to know for his task at what time? Which information has to be distributed to " members of the group, and which information is required by only certain individuals?

Adjustment to Information Overload

As the load on the communications system in a crisis increases, the search for information becomes less thorough and selectivity of attention becomes more important. Selective attention is employed by an organization as a method of coping with overwhelming amounts of information. This selectivity of attention functions to effectively cut down the amount of information to be handled. By limiting the search to certain types of information, the organization cuts down on its volume, but this is at a time when maximum information is needed for the best performance.

The phenomenon of selective attention is well documented. What has not been established is the *content* of the information that gets selected out. We know only the general proposition that new information, which conflicts with established conceptual sets, gets selected out, thus reinforcing old ideas and failing to give decision-makers cues to new and developing situations. Research is needed that can specify the content of the information that is selected out and the process by which this occurs. This research should be directed towards solving the problem, that is, towards developing a mechanism that would insure receptivity to new information.

Focusing on a broader area than selectivity of information, which is just one means of responding to information overload, Miller (1960) draws a general picture of the mechanisms by which an organization handles overload. His hypotheses are theoretical, with some, but not conclusive, empirical support. We believe they deserve further research. Discussed in Proposition 53, the mechanisms of adjustment to information overload that

Miller postulates are omission, error, queuing, filtering, cutting categories of discrimination, employing multiple channels, and escape from the task.

Alternative Organizational Structures

There is some research that relates organizational structure to decision-making. Proposition 78 compares the performance of groups with a loose structure with that of groups with a tight structure. Proposition 79 compares the effects of a vertical structure with those of a horizontal structure. However, these are the only substantiated relationships that we could find in the literature. Part of the problem may be that our literature survey covered psychological and sociological works, but not organization or management material. There may be more relevant research on alternative organizational structures in these disciplines. But we suspect that whatever conclusions are offered are not based on systematic research. Also, while the literature may discuss the alternative structures, it may not connect structure as an independent variable to the dependent variable of decision-making performance. We suggest future research of this nature, with simulation being the most promising methodology.

CHAPTER 11

IMPLICATIONS OF THE PROPOSITIONS FOR CRISIS MANAGEMENT

The conceptual framework we have developed represents an efficient scheme for organizing and relating research findings. But the model itself, based on social science literature, provides no guidelines by which the relative importance of the 81 propositions can be evaluated. What we need to do is place the social science findings within the context of the management of foreign policy crises as described in the literature on that topic. This chapter will provide some indications of the practical value of the research propositions, as well as directions for research that may be needed to make specific applications of more general findings.

Both the social science literature and accounts of past crises indicate hazards and risks in crisis management. By recognizing in advance these difficulties, it may well be possible to create and institutionalize approaches and procedures that enable crisis management to avoid the hazards and improve the quality of crisis decision-making.

As we attempt to fit social science literature into statements of implications and requirements for crisis management, four general types of limitations on the management process emerge. The policy recommendations which we draw from the propositions are designed to cope with these four limitations on effective crisis management:

1. Instinctual response to stress
2. Intellectual constraints
3. Existing value sets and distortions in perception
4. Bureaucratic constraints.

Instinctual Response to Stress

On a very general level, one of the observations that can be made from the literature is a conflict between man's almost instinctual reactions to stress and his more conscious, deliberate, rational responses. In the course of hundreds of centuries man developed physiological and psychological propensities for action that allowed him to survive and proliferate: he could identify threats and he could narrow his attention, concentrating on resolution of the immediate threat and temporarily discarding from his mind matters that, given the threat, had become less relevant. His repertoire of instinctual responses permitted him, within seconds, to produce an appropriate action in response to his own psychic signals, all without the need for deliberation or verbalization of the rationale for his actions.

Today these almost innate propensities for action and problem resolution are in many ways still highly adaptive to modern living—e.g., in crossing a traffic-laden street on foot, or in defensive driving of cars. In other ways, however, they can be highly maladaptive, especially when they tend to press man to release irrevocable, destructive forces in a complex, highly interdependent world society. Many such maladaptive propensities are reported in the social science literature and documented in case studies of crisis. Here we must point out that they require special attention by crisis managers who must, in effect, take steps to prevent or invert behaviors that are "natural" in an evolutionary sense but "dysfunctional" in the context of rational control over the crisis decision-making process. Thus it is of supreme importance that political and military executives who are responsible for crisis management decision-making should be forewarned of the many possibilities of unreasoned, instinctual responses. They should build into the decision-making apparatus the guidance needed, as well as safeguards against, maladaptive responses.

Intellectual Constraints

A second general limitation on effective crisis management is intellectual. Results from the literature indicate consistently that decision-makers are limited in such things as the amount of information they can absorb in a given period of time, the number of alternatives

that can be considered, the ability to foresee the consequences of alternative choices, the application of appropriate lessons from the past, their creativity in proposing new solutions, and other intellectual activities necessary for effective decision-making. These problems are particularly serious under the time pressure of crisis.

Vaughan and Mavor have compiled a summary of numerous findings regarding man's intellectual constraints in decision making. One of their conclusions is that man is basically conservative, unimaginative and uncritical and thus naturally ill-equipped for many of the central tasks usually subsumed under rational decision-making.[1] While not taking that extreme position, we conclude that the traditional "rational model" of decision-making, while of integral significance in explaining decision-making, must be modified to take into account man's intellectual limitations in undertaking the tasks specified in the model, particularly when he must undertake those tasks under the threat and time pressure of a foreign policy crisis.

Existing Value Sets and Distortions in Perceptions

There are a number of aspects to this third limitation on effective crisis management. First, there is the problem that the value orientations which guide our behavior are learned in our own culture and polity. It goes without saying that we tend to understand the motivations and perceptions emanating from our own culture better than those that derive from a foreign society. More specifically, and more to the point of *foreign policy* decision-making, the reward and payoff system is nationalistically egocentric. In most instances, promotion and prestige are based on considerations that are internal to the polity more than on the capabilities of leaders for cross-national thinking and for finding the accommodations that crises may require. Our actions are grounded in value sets derived from our own society. Managing a crisis demands an understanding of the value orientations of other nations in order to correctly interpret their actions and communications. Our existing value sets can present a serious danger to assessing the crisis situation.

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[1] W. S. Vaughan, Jr., and Anne S. Mavor, "Behavioral Characteristics of Men in the Performance of Some Decision-Making Task Components," *Ergonomics, 15*, 3 (1972), pp. 267-277.

A related constraint is that existing value sets structure our perceptions of the environment. We are apt to be most receptive to information that fits in comfortably with existing expectations. What happens in a situation of stress is that the individual is faced with new and unpleasant information that does not support existing preferences, expectations, and stereotypes. Instead of remaining flexible, a person's value set becomes rigid in the face of cues from the environment that are incompatible with his values. The individual begins to "select out" the contradictory information, with the results that his perceptions of the environment are distorted and his responses to the acts of others are inappropriate.

Thus, decision-makers of each nation in a crisis are apt to miscalculate the motivations of the other side and to misperceive the actions and signals of the other side. There are a number of examples of this behavior. Among them are Soviet misjudgment of U. S. response to arming Cuba with offensive missiles, North Korea's inaccurate perceptions of American policy for the defense of South Korea, and American misperceptions in interpreting the responses of the Soviet Union to the flight of people from East Berlin and the motivations that led them to the construction of the Berlin wall.

Bureaucratic Constraints

A great number of the limitations on effective crisis management that appear in the literature can be classified as bureaucratic constraints. Typically, crises have been managed by *ad hoc* groups and/or by relatively permanent groups operating in an *ad hoc* manner. In either case, bureaucratic limitations can greatly handicap effective crisis management.

For an *ad hoc* group, members must invent or learn operating procedures, contacts with other agencies involved, authority relationships, delegation of power, and so on. They must set up procedures for information monitoring, distribution of information, and handling the information overload. They must determine the size of the group, the membership, leadership roles, and the relative status and power of members. They must hastily assign tasks and coordinate activities among members and subgroups. Problems associated with all of these tasks, particularly when carried out under the time pressure of crisis, impose severe limitations on crisis management.

These limitations are more amenable to manipulation and correction than the other three types of constraints because there are usually bureaucratic solutions to the problems, and bureaucratic solutions are within the control of the decision-maker. It is easier, for example, to correct for an improper distribution of information than it is to compensate for the analytical abilities of the individual or the constraints of existing value sets. However, our own value sets and cultural predispositions may impose limitations on the kinds of bureaucratic solutions we are able to see as potentially relevant and effective. The question of the kinds of bureaucratic solutions that are viable in our culture is an important one to consider.

Recommendations

It is our general recommendation that improvements in the crisis management process be designed to compensate for one or more of the limitations we have discussed. With these four areas in mind, we have drawn more specific recommendations from the literature. It is important to note that the suggestions presented here are grounded in the research findings of social scientists. Our prescriptive statements are based on findings from research in which systematic control has been exercised and behavior observed and recorded. We have placed our recommendations within the context of crisis management. However, specific applications of these recommendations would require further research, and we provide guidelines for this research in our presentation.

In attempts to cope with the four types of limitations we have outlined, it is important to note that findings from one area of research may be applied to findings from a different area. That is, the effects of one independent variable on a particular decision-making task may be corrected by manipulating a different independent variable that affects the same decision-making task. For example, in the area of intellectual constraints, we know that stress has a negative effect on the creativity of the individual in generating alternative solutions to the problem at hand. Perhaps one can compensate for this by choosing individuals of superior intelligence, or by training individuals. But the more fruitful ways of overcoming the intellectual constraints of decision-making under stress may well involve the application of findings

from other areas of analysis. From sociological studies we know that the greater the group disagreement in the problem-solving task, the greater the creativity of alternatives that are generated. Thus the policy recommendation: In order to overcome the intellectual constraints of the individual, policy disagreement in the group should be encouraged when the group is considering alternative actions.

Of many possible areas, the recommendations presented below are included because we feel, from our analysis of the social science literature and case studies of past crises, that they deserve the immediate attention of those people responsible for crisis management.

1. **Extend the amount of time allowed or required to make decisions.**

One of the most important recommendations we can make is to cope with the problem of the amount of decision time available. In many—perhaps most—cases, decision time is not a "given," but can be increased. Actions should be taken to extend the amount of time available whenever possible.

Results from the literature indicate consistently that the effective performance of a number of decision-making tasks, as well as the likelihood of solution and the quality of the solution, depends on the time available to decision-makers Man can effectively focus attention on one or on a very few things at one time. As he encounters a new and complex problem, a man requires a considerable amount of time to initially review and learn the parameters of the problem—key unresolved issues, possible solutions, and constraints. There are wide individual differences here, but however intelligent a person, it takes time to learn and understand a problem in context. Research on innovation in science shows that in the great preponderance of cases, the "brilliant solution" came about after the thinker had spent a great deal of time intellectually reviewing the elements of the problem—trying out, rejecting, and reshaping tentative solutions in successive trials.

As an individual needs more time to come to a better solution, so does a group. Each (thinking) group member will have his own somewhat idiosyncratic perspective; each is conditioned in part by values and past experience. A frequent problem in crisis management

decision-making is to pull these strands together—often to decide how the problem is to be defined, what criteria can be used to evaluate solutions. If there is insufficient time to generate and evaluate alternatives, then "solutions" may be compromises among protagonists unsupported by clearcut policy, or a patchwork of recommendations of one or a few harried senior individuals, who, working under a deadline, hastily reach a solution that fails to account for key elements of the puzzle.

2. **Provide for early diagnosis of a possible crisis.**

Perhaps the most efficient way in which the decision time available can be extended is to set up procedures that insure the diagnosis of a possible crisis at the earliest time possible. Our study of the literature suggests that in many instances crises might have been anticipated in advance. The crises in Berlin 1961 and Cuba 1962, as well as the invasion of South Korea from the North, and perhaps even the capture of the Pueblo, are good examples. Certainly in the first three cases, there was ample early warning that the antagonist might take an action which would upset the existing equilibrium. As far as we can find, no group at the high military-political level was empowered to make the assumption that the antagonist might change the existing situation. No group was tasked with determining that a crisis was probable. No personnel were allocated to monitor the situation from an early point, define the problem, identify and analyze possible response options, and lay the groundwork for efficient management of the crisis.

To be sure, such a procedure would undoubtedly result in a number of cases where potential crises did not develop into actual ones. But the commitment of resources seems worth the cost in view of the stakes. In this context it might also be noted that such early warning might allow for early solution of problems, before they get to the crisis state.

3. **Select crisis managers capable of flexible and innovative thinking.**

The literature makes it clear that value sets and conceptual rigidity often determine our responses when confronted with new situations. These tendencies are exaggerated under time pressures and stress. There are very substantial individual differences in the ability to

understand the perspective of others, to be flexible, and to look for new possibilities of responses in crisis situations.

The question is the extent to which individuals capable of original thinking, capable of viewing situations from multiple perspectives, can be selected for key responsibilities in crisis management groups. Senior officials gain their positions because of their ability to excel within their military and civilian agencies. They may not necessarily be most effective in the shaping of crisis strategy when such strategy calls for accurate readings of the intents and actions of other nations. At a minimum, then, it would seem desirable to provide senior officials with a number of perspectives and options tied to those perspectives. A group working in close support of these officials might serve this function.

4. Institute effective and useful contingency planning.

Contingency planning is currently undertaken in the Department of Defense, but there is some question of the extent to which it is effectively utilized when a crisis occurs. Yet a great number of the problems pointed out in the literature relating to intellectual limitations could be alleviated by good contingency planning. Stress affects the ability of the individual to define a threat, reduces the creativity of his analytical abilities, and impairs his ability to generate and examine the consequences of alternative policy options. Good contingency plans, and of equal importance, good procedures for effectively applying and utilizing those plans, could solve these and related problems.

The problem is a difficult one. A contingency plan that can provide detailed guidance may never be used by the crisis managers, since the circumstances of the crisis at hand are (rightfully) judged to be different from the assumptions on which the plan was constructed. This type of specific contingency plan is rejected as irrelevant. A broad, general plan, on the other hand, may not provide sufficient guidance for the specific actions that must be taken for the crisis at hand. This type of plan is rejected as useless.

Perhaps there is a saddle point between breadth and specificity. General plans can be presented with annexes and instructions that would help crisis managers adapt them to specific situations. Such plans would lay out a number of viable options along with the rationale

for each, rather than focusing on one chosen method of action. The value and possibilities of this type of contingency planning deserve careful attention by the Department of Defense.

5. Compensate for the effects of fatigue and stress.

Typically, once crises begin, they continue on a 24-hour a day basis, until some resolution is reached. The stress and fatigue—these two are separate factors but interrelated—that result have many debilitating effects documented in the literature. The question of using replacements deserves careful attention. Crisis managers should be rotated on a regular basis. Rather than successive work shifts, however, we suggest that overlapping shifts be set up so that replacements can easily be brought into the ongoing work of the crisis management group with no loss in the effective performance of that group. Overlapping shifts means that the replacement starts his work shift well before the person he is replacing leaves, so that he can easily be brought up to date on the ongoing activity. It also means that the shifts of different individuals in the group should begin and end at different times, so that at no time is the group entirely composed of either fatigued individuals or fresh replacements.

Another solution is to identify key working hours or key crisis periods in which certain individuals are needed. That is, can we predict the critical periods of activity in which key members of the support and analysis group will be required, and the "off" periods when these people can rest and replacements can continue the process of crisis management.

Third, we suggest that the question of monitoring the performance of crisis management groups be investigated. It is important to consider possible procedures by which one might effectively and unobtrusively monitor for disintegration of performance, confusion, irritability, and feelings of unreality in operations under stressful conditions.

Finally, the literature provides evidence that the negative effects of stress can be at least partially reduced through effective training. Simulation of a crisis management situation should provide a method by which the individual is made aware of the negative effects of stress and opportunities for coping with them. In addition, training sessions could be used to evaluate performance for the selection of individuals to participate in crisis management.

6. **Establish a standing crisis management group.**

There are substantial indications from the literature that many of the problems encountered in crisis management can best be solved in the context of a formal, ongoing group that is tasked with the responsibility for crisis management activities. That is, the necessary functions for crisis management can most effectively be accomplished by a group that has an ongoing status and uses regularized procedures. These functions do not encompass decision-making, but the support and analytical activities required by decision-making bodies, as well as the anticipation and possible prevention of potential crises.

We believe that the recommendations presented in this chapter can best be implemented through an established group. In addition, as a research vehicle, the conceptualization of this group helps to bring together hypotheses, to consider propositions in the context of the policy process, and to make the recommendations more specific. For these reasons, we consider this to be one of the most important recommendations that can be derived from the literature. The remaining recommendations, to varying degrees, are predicated on the establishment of such a group.

7. **Structure the crisis group for maximum decision performance.**

Propositions in Chapter 7 indicate that a vertical task structure (different functions assigned to different members) produces superior performance as compared to a horizontal structure. This contradicts the tendency of some decision-making groups to get together as a whole group so that all members must deal with all facets of the problem. Each group member does not have to be cognizant of the entire situation. In addition, the research suggests that the group should be structured so that there can be loose or open communications between members, so that access among subgroups is facilitated.

These and similar findings about structuring the group are important and implementable propositions. In an effort to formulate specific recommendations, simulation provides an eminently suitable research method in which the structure of the group can be varied to determine effects on decision-making.

8. **Provide for special leadership needs.**

The previous recommendation implies the need for the important leadership role of coordination. Having assigned people to subgroups, each of which works on one piece of the problem, it is extremely critical that leaders maintain contact with these subgroups and insure communication among them. In addition to displaying military information in the room(s) being used for crisis management, it is possible to display information on which subgroups are responsible for which tasks, what their deadlines are, who they must receive information from and transmit information to, and so on.

Leaders must also serve the function of translating policy down into its meaning and implications for the work of the crisis management group. In accounts of U. S. response to past crises, we have found that often policies were stated only at a very general level so that individuals or subgroups working on the problem did not have specific guidance. It is easy then to understand how, as the research points out, they tend to revert back to prior value sets and habits of operation. Leaders must continually translate the intent of policy to all crisis management participants.

Finally, we recommend that attention be given to the need for a leader to handle the socio-emotional relationships in the group in addition to a leader to handle the solution of the problem. Research shows that in a crisis situation these two roles tend to become differentiated. While there is always concern for task leadership, the role of socio-emotional leader may be neglected. It is, however, an important one in a group that is working under the stressful conditions of a foreign policy crisis.

9. **Manage the group dynamics.**

There are a number of propositions throughout the report that show the positive effects of disagreement on some tasks in the crisis management process and the negative effects of conflict on others. For example, group disagreement that focuses on alternatives can lead to more creative proposals for response. Conflict that is oriented toward personalities or

personal relationships has negative effects on the ability of the group to reach a solution. Thus control of the dynamics of the group becomes an important tool in improving crisis management.

10. Improve information management procedures.

It is clear from the crisis literature that the inability to keep decision-makers fully informed and current is a critical problem. Many recommendations from prior crisis management studies make this point. Social science literature shows clearly that the caliber of decisions depends greatly on the provision of accurate and timely information to decision-makers. A problem in providing this information is that the system, in trying to process an increased amount of information from a decreased number of channels, becomes overloaded. Again, human factors literature shows cases of individual and system breakdown when information systems become overloaded.

It is easy to diagnose the need for improving information management; there are a host of problems, however, in the implementation of solutions. In crisis situations, as screening systems are established to prevent overload, the screening process may distort the information picture where the system is not attuned to process unaccustomed--but relevant--information. Further, those who carry out the screening may selectively choose information which supports their existing preferences and concepts.

Another problem lies in the difficulty during crises of transmitting information to individuals who, by virtue of their knowledge and responsibilities, need direct channels to the crisis management group. It would appear that *ad hoc* arrangements, which have often been used to "manage" prior crises, would, in the time pressures characteristic of crisis, have difficulty in establishing and fully utilizing communication channels to all individuals who have a need to know and/or can contribute information critical to the solution of crisis problems.

11. **Improve access to information by taking advantage of state-of-the-art communications technology.**

A number of steps can be taken to overcome time pressures and man's intellectual limitations by using state-of-the-art communications/display technology. Among ideas that occur to us and that can be researched by simulation are the following:

a. Provision of a system for maintaining screened and updated information accessible on demand.

b. Video linkings of command centers. Satellite systems make world-wide instant video hook-ups possible. Security may be an insurmountable problem. But video displays of situational information from distant commands (which could be instantaneously copied) should help keep key decision-makers current.

c. Provisions of shared displays of current information as to task assignments and deadlines for personnel or groups in the command center, as well as displays of relevant events, forces, etc., at the crisis site.

d. Projections of forces, and trends of events into the future. We suspect that one of man's basic intellectual limitations lies in his limited ability to simultaneously project trends of several types of events into the future, and to visualize their configuration and interrelationships at specified future times. Available technology can compute and project simultaneously trends of a number of events, as well as various assumed changes therein to a desired future time frame. Such projections might well be of assistance to the planning of responses.

Summary

The recommendations above derive from a first attempt to visualize the relevance of social science findings in the real world of crisis decision-making. Many findings from the social sciences cited are rather well-established; they show up consistently in repeated studies. Our visualizations of foreign policy crisis management have been limited to accounts in the open literature. It was not a part of our research task to study these in detail. Admittedly, many of our recommendations are not new; there are scores of studies on command/control systems, many currently in progress.

Most of these studies of command/control systems view man as a constant, or perhaps as a processor of information operating according to predetermined stochastic probabilities. To a great extent these studies ignore the impact of man's emotional makeup, his intellectual capabilities, his value orientations, and his bureaucratic organizations on the quality of decisions. We think that the approach of this report provides new insights whose application to the policy process can improve the management of foreign policy crises.

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