

8-1-1961

An Executive Decision-Making Game Designed to Observe Executive Decision-Making Behavior

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AN EXECUTIVE DECISION-MAKING GAME
DESIGNED TO OBSERVE
EXECUTIVE DECISION-MAKING BEHAVIOR

A Thesis
Presented to
the Faculty of the Graduate School
Municipal University of Omaha

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

by
Richard Wayne Nicholson
August 1961

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CHAPTER I

THE PROBLEM AND DEFINITION OF TERMS USED

Decision-making is not something that has been discovered within the last decade, yet there has been a vast amount of concern and interest in decision-making in the last ten years. Industrialists, economists, psychologists, military leaders, businessmen--all are concerned with the question, "How can we improve executive decisions, and train and select better decision-makers?" This question may be better answered if we understand the decision-making processes of the executive.

I. THE PROBLEM

Statement of the problem. It was the purpose of this study to ascertain observable elements of executive decision-making behavior, and based on these elements, design an operational game which would serve as a device to enable the psychologist to observe executive decision-making behavior in the laboratory.

Importance of the study. Drucker has stated, "the future of the free enterprise system may depend on our ability to make major managerial and entrepreneurial decisions more rationally, and to make more people capable of making

and of understanding such decisions".¹ To accomplish this, a better understanding of the decision-making process is needed. There has been a recent increase of literature concerning decision-making. There is a criss-cross of idea and theory, and hence a serious problem of finding true perspective in the area of decision-making.²

Many theories of decision-making have been proposed. In these theories, the decision-maker is a rational being, i.e., he always acts to maximize expected utility. The assumption is that a limited, knowable number of alternatives exist. Kennedy³, Edwards⁴, and others have pointed out that decision-makers do not always act to maximize expected utility. Cohen⁵ has concluded, on the basis of his investigations of subjective probability assessment, that subjects seemed to be guided by psychological, rather than mathematical considerations, even though objective probabilities were

¹Peter F. Drucker, "Thinking Ahead", Harvard Business Review, 37: 26-30, January/February, 1951, p. 26.

²Paul Wasserman, with Fred J. Silander, Decision-Making: An Annotated Bibliography (New York, Cayuga Press, Inc., 1958), p. 4.

³John L. Kennedy, Game Theory and Its Relation To Industrial Psychology, Princeton University, Princeton, N. J., 1959. (Unpublished paper)

⁴Ward Edwards, "The Theory of Decision-Making," Psychological Bulletin, 51: 380-417, 1954

⁵John Cohen, "Subjective Probability", Scientific American, 197: 73-8, November, 1957.

ostensibly simple.

II. DEFINITION OF TERMS USED

Decision-making - a process of gathering and evaluating information, generating alternative courses of action, and effecting one or more generated alternative courses of action.

Operational game - a device which simulates a portion of the real world. People are placed in realistic situations in order to derive assumptions about human behavior. (The terms, "operational game" and "business game" are synonymous in this study.)

Risk - a proposal concerning the future, to which definite probabilities may be attached.

Certainty - risk, with probabilities of zero and one.

Uncertainty - a proposal concerning the future, to which no definite probabilities may be attached.

Subjective probability - an individual's own private assessment of chance, which is based upon the individual's experiences and reasoning ability. This assessment may or may not agree with objective probabilities.

Objective probability - the relative frequency of an event in an infinite class of events. (The "true" value

of a probability, i.e., the value that would be obtained if observations were exhaustive.)

Content analysis - "quantitative classification of a given body of content, in terms of a system of categories devised to yield data relevant to specific hypotheses concerning that content."⁸

Expected Utility - psychological or expected value of entities, objects, goals, etc.⁹

III. LIMITATIONS OF THIS STUDY

An operational game is presented in this study for the purpose of experimental observation of executive decision-making behavior. The game does not purport to be a model or theory of decision-making, but a device which, it is hoped, will facilitate observation of certain aspects of decision-making behavior. Whether or not this expectation will be met fully remains to be tested, and is not within the scope of this study.

⁸Bernard Berleson, Content Analysis in Communication Research (Glencoe, Illinois, The Free Press, 1952) p. 15.

⁹C. H. Coombs and David Beardslee, "On Decision-Making Under Uncertainty", Decision Processes. Edited by R. M. Thrall, C. H. Coombs, R. L. Davis (New York: John Wiley and Sons, Inc., 1954) p. 257.

IV. ORGANIZATION OF REMAINDER OF THE THESIS

The remainder of the thesis is organized into four chapters. Chapter II surveys pertinent literature in the fields of decision-making, decision theory, and operational gaming. Chapter III is devoted to discussion of procedure and treatment of the data. Chapter IV presents the executive decision-making game, which has been designed as an apparatus to facilitate laboratory observation of executive decision-making behavior. Chapter V, the final chapter, presents a summary and conclusions, and suggests research which is beyond the scope of this study.

CHAPTER II

REVIEW OF THE LITERATURE

Considerable material has been written concerning game theory, decision theory, and decision-making. Due to the limited mathematical background of the author, a comprehensive review of the game and decision theory literature has not been undertaken. The volume of literature in the area of operational gaming has not been as great as that of game and decision theory, and decision-making. Wasserman¹⁰ has presented an excellent coverage up to 1958 of literature in the area of decision-making, decision-theory, game theory, and operational gaming.

This review is divided into two general areas for purpose of clarity and organization. These areas are: (1) decision-making, decision theory and game theory, and (2) operational gaming.

I. A REVIEW OF DECISION-MAKING, DECISION THEORY, AND GAME THEORY LITERATURE

Edwards reviews much of the literature concerning decision theory and presents his criticisms of mathematical and

¹⁰Paul Wasserman, with Fred S. Silander, Decision-Making: An Annotated Bibliography (New York: Cayuga Press, Inc., 1958).

statistical models of decision-making as follows:¹¹ These theories center on the notion of the subjective value or utility of alternatives, and they assume the rationality of the decision-maker, i.e., the decision-maker always chooses so as to maximize expected utility. This appears to be contradicted by observable behavior in many risky situations, i.e., the decision-maker does not always act to maximize expected utility. The decision-maker's estimate of a probability may be considerably different from objective or mathematical probability. For this reason, mathematical and statistical theories of decision-making are not utilized in this study.

Coombs discusses three psychological variables in decision-making, utility for prize $U(P)$, utility for stake $U(S)$, and psychological probability (ψ). Utility is synonymous with "preferability." Psychological or subjective probability is equivalent to "personal probability" when the observation is replicable (objective frequencies implicit), and "degree of belief", when the observation is a single event.¹²

Bates presents a formal model for the science of decision. This model is restricted to work done in carefully structured situations, and not those aspects concerned with

¹¹Ward Edwards, "The Theory of Decision-Making", Psychol. Bull., 51: 380-417, 1954.

¹²C. H. Coombs and David Beardslee, Decision Processes (Edited by R. M. Thrall, C. H. Coombs, R. L. Davis, New York: John Wiley and Sons, Inc., 1954). pp. 255-85.

gathering empirical data. He discusses von Neumann's Game Theory, payoff functions, mixed and pure strategies, and zero sum and non-zero sum games. He points out limitations of game theory as a model for a science of decision.¹³

Siegel¹⁴ asserts that level of aspiration is an important factor in decision-making. An individual's choices among alternatives involving certain outcomes (outcomes with stated probabilities of attainment) are based on the utility of the entities (objects, actions, goals, etc.), and on the subjective probability associated with attainment of the entities. The decision is a function of these two variables inasmuch as the individual seeks by his choice to maximize the sum of the products of utility and subjective probability as follows:

$$SEU = \sum_i p_i u_i$$

where SEU is subjectively expected utility, p_i is the subjective probability of the occurrence of the i th state, u_i is the value outcome of the i th state, and u is a function of level of aspiration and reinforcement.

Edwards indicates that subjects in studies of betting preferences do not always act so as to maximize expected utility, particularly when amounts of money are very large,

¹³James A. Bates, "A Model for the Science of Decision", Philosophy of Science, 21: 326-39, 1954.

¹⁴Sidney Siegel, "Level of Aspiration and Decision-Making", Psychological Review, 64: 253-61, July, 1957

or when probability differences are very small. In this study, subjects were informed of objective probabilities. Certain subjects preferred low objective probabilities of losing large amounts of money to high objective probabilities of losing small amounts of money. Edwards suggests that the subjective probability function for positive expected values may differ from the function for negative expected values.¹⁵

Sufficient sampling of behavior may permit reasonable quantification of value outcomes, but at the present time, this is not possible.

Toda points out certain limitations of game theory. First, game theory fails to account for the fact that not all participants in games are complete strategists. A more serious limitation of game theory is that the theory assumes that values of objective probabilities in chance moves are known to all participants. This is seldom realized in real life.¹⁶

Watkins claims that it is only under conditions of uncertainty that we can properly make decisions at all. The most significant decisions are those whose outcome tends to be uncertain. The classical theory of decision-making in the past has been one that presupposed foreknowledge of the

¹⁵Ward Edwards, "The Theory of Decision-Making", Psychol. Bull., 51: 380-417, 1954.

¹⁶Masanao Toda, "Information-Receiving Behavior of Man", Psychological Review, 64: 253-61, July 1957.

decision's outcome. In the twentieth century, foreknowledge was amended to become knowledge of the probabilities of the possible outcomes of a decision, in line with a general tendency to substitute objective probability for uncertainty. According to Watkins, it is only in special situations that an objective probability approach to decision-making is applicable. Where the decision-maker has to depend upon uncertainty about a decision's outcome or its probabilities of outcomes, he must rely upon subjective characterization of the decision's possibilities.¹⁷

Feather reviews five approaches which relate to analysis of behavior in a choice situation where a decision is made between alternatives having different subjective probabilities of attainment. The important implication of his work for this study is the recommended importance of observing decision-making behavior in different types of situations.¹⁸

Johnson points out the existence of renewed interest in investigation of thinking processes involved in decision-making. He asserts that decision-makers probably do not make

¹⁷J. W. N. Watkins, Uncertainty and Business Decisions (A symposium edited by C. F. Carter, G. P. Meredith, and G. L. S. Shackle; Liverpool, England: Liverpool University Press, 1957), p. 107.

¹⁸W. T. Feather, "Subjective Probability and Decision Under Uncertainty", Psychological Review, 66: 150-64, May 1959.

decisions according to the decision-making models proposed by game theory.¹⁹ This tends to support the need for a means of experimentally observing decision making behavior, in order to gain further understanding of decision-making.

The idea of sampling is an essential element for making decisions, according to Cohen.²⁰ Cohen indicates that uncertainty is with us at all times. We must act on incomplete information in our everyday decisions. He has also conducted an extensive investigation in the area of subjective probability. He has attempted to determine whether or not subjective probability has anything to do with objective probability, and to what extent subjective probability obeys distinctive psychological rules of its own. Experiments conducted at the University of Manchester have shown that with increasing age and experience, uncertain situations are structured in closer accord with objective, mathematical expectation. Thus, the decision-maker becomes more realistic with increases in age and experience.

Bruner, Goodnow and Austin²¹ emphasize that the more usual state of nature or decision-making situations is one in which certainty of inference from defining attributes to

¹⁹Donald M. Johnson, in Psychology and Life (5th edition; Chicago: Scott, Foresman and Company, 1958), pp. 554-6.

²⁰John Cohen, "Subjective Probability", Scientific American, 197: 73-8, November 1957.

²¹Jerome S. Bruner, Jacqueline J. Goodnow and George A. Austin, A Study of Thinking (New York: John Wiley and Sons, Inc., 1956), pp. 182-230.

categorical identity cannot be achieved. The decision-making environment is so ordered that probabilistic rather than certain relationships hold between objects and their categorical identity. There are also differences in the kind of information one searches for in order to make a particular decision as opposed to a series of decisions. The important difference is that with a series of decisions, there is an expectation of regrouping or nullifying past errors or losses.

The difficulties inherent in attempting to gather and quantify information concerning factors in business decisions are pointed out by Katona and Morgan.²² The authors suggest the use of the informal, "chatty" type of interview.

Browne discusses the influence in decision-making of organization goals, purposes and objectives; the need for effective communication of these established goals throughout the organization, and the evaluation of past achievements of the organization. He has devised a "Goal and Achievement Index", in order to study executive processes. This device was used to establish rank order for established organizational purposes, e.g., profit, good-will, etc. Browne asserts that the device offers promise for studying decision-making as related to knowledge of company goals and achievement.²³ This approach is limited to decision-making behavior

²²George Katona and James N. Morgan, "The Quantitative Study of Factors Determining Business Decisions", The Quarterly Journal of Economics, 66: 48-54, 1952.

²³C. G. Browne, "Study of Executive Leadership in

within a specific company.

Cartwright and Festinger propose a combination theory involving vector and topological analysis. This theory has been mathematically quantified in a form amenable to empirical testing.²⁴ A limited, knowable number of alternatives is assumed in this theory. Therefore, the theory is not particularly promising for use in conjunction with operational gaming.

Cartwright further proposes that increases in length of decision time are produced by a conflict between different responses and that such a conflict arises when a stimulus falls upon the border between two ranges of equivalent stimuli. He concludes that this phase of his theory is substantiated.²⁵

Forrester emphasizes the need for management to discover underlying principles and develop a basic theory of behavior. He discusses the emphasis on exploration by the military into the field of decision-making, noting that there has been a shift from tactical decision-making to strategic or long-range decision-making.²⁶

Business", J. Appl. Psychol., 34: 82-7, April, 1950.

²⁴D. Cartwright and L. Festinger, "A Quantitative Theory of Decision", Psychological Review, 50: 595-621, 1943.

²⁵D. Cartwright, "Relation of Decision Time to the Categories of Response", Amer. J. Psychol., 64: 174-96, 1941.

²⁶Jay N. Forrester, "Industrial Dynamics, A Major Break through for Decision-Makers", Harvard Business Review, 36: 36-66, July/August, 1958.

Barnard believes that discrimination of strategic factors is of great importance in the decision-making process. By strategic factors, he means the limiting factor in a possible course of action. For example, if a piece of land will not produce because of a lack of potash, potash is the limiting factor. Another important factor in decision-making is redefinition or change of purpose on the basis of the estimate of future results of action in the existing situation, in the light of history, experience and knowledge of the past.²⁷ Barnard also states that one of the biggest difficulties in appraising the decision maker and his relative merits lies in the fact that there is little direct opportunity to observe the essential operation of decision-making.²⁸

Jones feels that the key problem in decision-making is to make a realistic appraisal of the many probable results of taking a certain action before these results have occurred. He emphasizes the use of premises in making decisions, and he differentiates between factual and value premises. By factual premises, he means the type of measurement or standard the decision-maker employs when he considers a premise. Value premises refer to how the decision-maker measures the cause and result of a premise he is considering. Factual premises are objectively evaluated and value premises are subjectively

²⁷Chester I. Barnard, The Functions of the Executive (Cambridge: Harvard University Press, 1948), p. 204.

²⁸Ibid., p. 193.

evaluated.²⁹

Drucker points out that too much emphasis in decision-making centers around problem-solving, i.e., giving answers. He asserts that the kind of decision-making involved in problem-solving, is the unimportant or routine decision i.e., the job is merely to choose from among a few obvious alternatives. The important decisions are the strategic decisions. These decisions involve ascertainment of resources, or determining what they should be; or evaluating the situation and changing factors in it when necessary. The emphasis here is on finding the right questions, the right answers, the correct course of action and implementing it.³⁰

Simon states that decision-making is a process of choice which leads to action. Multitudes of alternatives are available, and there exists a process whereby the numerous alternatives are narrowed down to one which is decided upon and usually executed. Self-conscious, deliberate rational processes are connoted. However, decision-making may include any or all of these elements to any degree, and may include processes of which the decision-maker is unaware. There is a concept of purposiveness in making decisions, even though there may be no conscious, deliberate integration

²⁹Manley Howe Jones, Executive Decision-Making (Homewood: Richard D. Irwin, Inc., 1951), pp. 53-91.

³⁰Peter F. Drucker, The Practice of Management (New York: Harper and Brothers, 1954), p. 353.

of goals. Nevertheless, goal integration does occur, and weights are assigned to the goals either consciously or unconsciously.³¹ Simon also notes limitations to the psychological environment of choice. These are: (1) incompleteness of knowledge; (2) difficulties of anticipation; and (3) the unlimited scope of behavior possibilities.³²

Most decisions seem to be made on the basis of incomplete evidence, and information from many sources is usually required, according to Shartle.³³ Decision-making implies that there are alternative courses of action. An attempt is made to predict consequences and then make the decision that will apparently result in the desired outcome. The key operation in executive decision-making is prediction. Shartle also feels that patterns exist in decision-making behavior.³⁴

Although few executives have any idea how they go about making decisions, the complex process of decision-making is being increasingly subjected to scientific analysis, according to McDonald.³⁵ Decision-making is commanding the

³¹Herbert A. Simon, Administrative Behavior (2nd edition; New York; The Macmillan Company, 1957), pp. 3-6.

³²Ibid., pp. 80-2

³³Carroll L. Shartle, Executive Performance and Leadership (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1956), pp 283-8.

³⁴Ibid., p. 286.

³⁵John McDonald, "How Businessmen Make Decisions", Fortune, 52: 84-7, August 1955.

attention of both the businessman and the scientist. There is a preoccupation of hundreds of the country's best academic minds with decision-making as an identifiable aspect of human behavior. The executive is expected to scan the range of possibilities with regard to prices, production, organization, and the distribution of benefits that is larger, more complex and more obscure than the range of possibilities in a chess game. He is expected to reduce these possibilities to manageable proportions and find feasible courses of action, although advanced logic and mathematics will not do this except for a well defined, limited, artificial game. He is expected to predict with accuracy in novel and non-repeatable situations.

An article in Business Week³⁶ discusses the work of the Carnegie Institute's Graduate School of Industrial Administration, Pittsburgh, Pa., under the direction of Dr. Simon. This work is in the realm of executive decision-making. As of April, 1957, \$170,000 had been spent out of an initial \$250,000 Ford Foundation Grant and another \$250,000 had just been awarded. Members of the institute have sat in on a variety of decisions with ten companies, making and recording extensive observations of the decision-making process. A number of laboratory studies have been conducted to determine

³⁶"Light on Deciding", Business Week, 184-5, April 13, 1957.

handling needed information in decision-making. Results of these studies are not yet available.

Drucker points out that there is little, although much needed emphasis on research on managing an enterprise, i.e., on the decision-making job. He believes that the future of our free enterprise system may depend on our ability to make major managerial decisions more rationally, and to train more people to be capable of making and understanding such decisions.³⁷

In another article, Drucker says that the emphasis in management over the next twenty years will be on the understanding of decision-making. The resulting understanding of decision-making behavior, coupled with recent advances in organization theory, human relations, economic analysis, and market research, should bring about a great improvement in our managerial skill and performance.³⁸

The major function of today's executive is making proper decisions, according to Middleswart.³⁹ Until recent years these decisions have had to be made following steps which were vague and ill-defined. Operations research, matrix theory and regression analysis have enabled the

³⁷Peter F. Drucker, "Thinking Ahead", Harvard Business Review, 37: 26-30, January/February, 1959.

³⁸Peter F. Drucker, "How to Make a Business Decision", Nation's Business, 44: 38-9, April 1956.

³⁹Frank F. Middleswart, "Operations Research: What It Is and How You Can Use It", Office Executive, 34: 30-2 March, 1959.

executive to obtain considerably more factual material in a given amount of time, and thus the decision-making burden has been lightened.

In a 1959 symposium concerning the future of industrial psychology, Shartle states that a single, important decision may involve the highest order of human strategy. According to Shartle, human values and their role in decision-making is an area in which much work must be done. Such studies are needed in both problems of prediction and of evaluation.⁴⁰

II. A REVIEW OF OPERATIONAL GAMING LITERATURE

Katzell discusses the need for operations research.⁴¹ He emphasizes the need to develop more skill in operations research, and he points out the difficulties involved in observing naturally occurring events in industry. He feels that we will rely more heavily on laboratory observation of the simulated industrial situation to advance our knowledge concerning industrial behavior.

Several essential points in operational gaming have been indicated by Andlinger.⁴² These are:

⁴⁰Carroll L. Shartle, "Blueprinting the Next Ten Years in Industrial Psychology (A Symposium)", Personnel Psychology 12: 40-5, January 1959.

⁴¹Raymond A. Katzell, "Blueprinting the Next Ten Years in Industrial Psychology" (A Symposium), Personnel Psychology, 12: 47-8, January, 1959.

⁴²G. R. Andlinger, "Looking Around", Harvard Business Review, 36: 147-50, July-August, 1958.

1. The game involves conflict or competition.
2. Incomplete information regarding states of the situation.
3. Uncertain outcomes.

Andlinger proposes that operational games be used as predictors of executive performance and as an instrument for business and behavior research.⁴³

Kennedy reports on two purposes for development of business games at Princeton.⁴⁴ The first of these is to teach students how to observe human behavior quantitatively in the industrial setting and how to use data to forecast performance. The second purpose (and of specific concern in this study) is as a research tool for studying human behavior in a "rich", but controlled environment.

Andlinger points out that operational gaming is a device which corresponds to the economics of a business as realistically as possible. Operational gaming is not related to game theory, which is a theoretical approach to the solution of conflict situations.⁴⁵ He also discusses a game which he has designed to serve as a teaching device for executives.⁴⁶

⁴³Ibid., p. 160.

⁴⁴John L. Kennedy, "Gaming Theory and Its Relation to Industrial Psychology", Princeton University, Princeton, N. J., 1959 (Unpublished paper).

⁴⁵G. R. Andlinger, "Business Games--Play One", Harvard Business Review, 36: 115-25, March-April, 1958.

⁴⁶Ibid., pp. 117-23.

McDonald and Ricciardi discuss a business game entitled "Top Management Decision Simulation".⁴⁷ This game is played with a team of eight executives. They make decisions on prices, production, marketing, research and development, plant investment, and market research. The game has been designed primarily as a training device for middle-level and top-level executives. The game simulates ten years of decision-making. This is a computer game and is therefore too complex to be used as a simple laboratory apparatus.

Sisson and Greene have described seven non-computer games in a recent publication.⁴⁸ Educational value is stressed in these games. The authors say that a business game should emphasize those factors which are thought to be most important in decision-making. They have selected games rather than case studies for training decision-makers, since a game is more dynamic, i.e., each subsequent situation depends in part upon the information and action preceding it, whereas the case study presents a situation statically.⁴⁹

Vance has presented an operational game for training purposes entitled "Management Decision Simulation".⁵⁰ This

⁴⁷John McDonald and Franc Ricciardi, "The Business Decision Game", Fortune, 47: 140-42, March, 1958.

⁴⁸Roger L. Sisson and Jay R. Greene, Dynamic Management Decision Games (New York: John Wiley and Sons, Inc., 1959).

⁴⁹Ibid., pp. 1-3.

⁵⁰Stanley Vance, Management Decision Simulation, (New

is a non-computer business game designed to provide practical management development training. The game is played by four-man teams and involves considerable book-keeping. It is too complicated to serve as a laboratory device for behavioral observation.

The "Business In-Basket Test" has been designed by Ward to serve as a testing device.⁵¹ The test purportedly evaluates an individual's ability to perform certain management tasks. The subject is confronted with a miniature sample of an executive's job in the form of an "in-basket". The game is lengthy and complicated. It lacks the simplicity desired as a laboratory observational apparatus.

"Gambit" is a military training game designed by Newton.⁵² The game contains elements critical to making armored tactical decisions. Two players, each in a separate room, directly maneuver a platoon of tanks in opposition to one another. The players are provided with maps, terrain boards, and general instructions and each player is supervised by an instructor. The game is concluded when the players' assigned mission has been accomplished. The game appears to be an excellent military training device, but again it is complex.

York: McGraw-Hill Book Company, Inc., 1960).

⁵¹Lewis B. Ward, The Business In-Basket Test (Princeton, N. J.: Educational Testing Service, 1959).

⁵²John M. Newton, Gambit: A Tactical Training Game for Armored Platoon Leaders (Graton, Conn.: General Dynamics Corporation Electric Boat Division, 1959).

Nicholson and Jaynes⁵³ have designed a business game to serve as a teaching device in industrial psychology classes. The game's objective is to familiarize students with certain personnel selection tests and to emphasize "pitfalls" in psychological testing. The game is played by a two person team, one serving as "umpire", and the other as "player". The game was designed primarily as a teaching device, and is too complicated to serve as a simple laboratory device.

III. A SUMMARY OF THE LITERATURE REVIEW

Literature in the areas of decision-making, decision theory, and game theory is abundant. A review of this literature indicates that considerable research has been done in these areas. One criticism of decision and game theory is that explicitly or implicitly the decision maker is assumed to attempt to maximize expected utility. This may not always be the case.^{54,55,56} The other major criticism is that decision theory and game theory assume that there exists for

⁵³Richard W. Nicholson and William E. Jaynes, "A Personnel Testing and Selection Game", June, 1960, (Municipal University of Omaha, Omaha, Nebraska. Unpublished).

⁵⁴John L. Kennedy, "Game Theory and Its Relation to Industrial Psychology", Princeton University, Princeton, N. J., 1959 (Unpublished paper).

⁵⁵Ward Edwards, "The Theory of Decision-Making", Psychol. Bull., 51: 380-417, 1954.

⁵⁶Paul Wasserman with Fred J. Silander, "Decision-Making: An Annotated Bibliography" (New York, Cayuga Press, Inc., 1958).

the decision-maker a limited, knowable number of alternatives. This of course is not the usual case in real life, and so we shall look elsewhere for a simple laboratory apparatus to observe executive decision-making behavior.

A review of operational gaming literature indicates an increasing emphasis by management on business games and operations research. Clearly too, there are many business games in existence. Most of the games have been devised for training purposes, and range in complexity from rather complicated, hand computed games to games involving the use of large computers. The literature reviewed in this study has not indicated that a simple game exists which will provide a rich, but controlled decision-making environment. However, leaders in many fields have become increasingly aware of the importance of understanding decision-making behavior.

CHAPTER III

PROCEDURE AND TREATMENT OF THE DATA

In order to design an operational game which will representatively sample executive decision-making behavior, it is necessary to determine if essential elements of decision-making exist.

Do various decision-makers follow certain common steps in decision-making? If so, are the steps used a specific function of the type of decision, the situation, the position of the decision-maker, and/or the decision-maker himself? If these elements are ascertainable, which of these elements should be incorporated in the design of a laboratory apparatus in order to provide a rich but simple and carefully controlled decision-making environment?

To answer these and other pertinent questions, field interviews of executives in Omaha, Nebraska were conducted and the material resulting from these interviews was analyzed.

I. THE INTERVIEW PROCEDURE

Basic assumptions regarding the interviews. Two basic assumptions are made regarding the interviews. First, it is assumed that the executive interviewees verbalized actual decision-making behavior, i.e., they stated what

they did and thought about in the process of making a decision as opposed to what they felt that the "ideal" executive should think and do. Second, the interviews indicate some of the elements or steps in the decision-making process, but not necessarily all of these elements or steps.

Selection of interviewees The most pertinent problem in selecting executives to be interviewed is the problem of executive availability and time. Ordinarily it is difficult for the busy executive to devote several hours of his time to an interview of this nature. Ideally it would be desirable to sample randomly the Omaha executive population, but this is practically an impossibility. Fifteen executives were contacted by telephone. However only ten of these executives were available for interview during the period of June through July 1960. Job titles and type of firm or business of the executives are shown in Appendix A. The minimum number of persons who reported directly to each executive interviewee was three and the maximum was seven. Anonymity of the executives has been preserved as requested by letter coding.

Type of interview. A free, unstructured, "chatty" type of interview was used. The objective of the interview was to have the executive verbalize thought processes which occurred during a decision-making situation. Too often the interviewer will "lead" the interviewee by suggesting an answer to a question or obviously suggesting a new area for

discussion. Every possible effort was made to avoid "leading" questions during the interview. Each interview was completed at one time.

Pre-interview procedure. Each interview period was arranged with the interviewee several days to a week in advance. Each appointment was confirmed several days prior to the scheduled time. In some cases, rearrangements were necessary. All interviews were conducted by the author of this study. At the time of initial contact, each interviewee was informed that the interview would be of one to two hours duration, and that the author was gathering data for research in the area of executive decision-making.

Interview procedure. Interviews were conducted in each executive's office. The first part of each interview was spent in "warming-up" and getting acquainted. Usually, after this short amount of time, the executive would respond by saying, "I understand that you are conducting research in the area of executive decision-making. How can I be of help to you?" or words to that effect. If this type of behavior did not occur, the author would suggest discussing decision-making by saying, "I'm sure that you are called upon to make many decisions in your job. How do you make a decision?" Very little guiding was then required to complete each interview.

Method of recording the interviews. The interviews were recorded "long-hand" by the author and are appended to

this study. (Appendix B). No attempt was made to organize the material gathered in each interview, rather, the material was recorded as spoken. Verbatim recording was not possible, but every effort was made to record what seemed to be important comments by the interviewee.

The use of a tape recorder was initially considered. To determine the feasibility of using a tape recorder, experimental interviews were conducted with two executives. The same topic and procedure were used as in the case of the ten interviews reported in this study. Several difficulties were encountered in attempting to record these interviews. First, the procedure of setting up the recorder and adjusting the recording equipment was distracting and very time consuming. Second, it was difficult to establish rapport. The interviewees appeared to be overly concerned with the recording apparatus and they seemed to be very cautious and reserved in communicating. One of the experimental interviewees expressed the idea that he couldn't "let himself go" in the interview. For these reasons, tape recording of the interviews was not done.

II. ANALYSIS OF THE INTERVIEWS

To design a game which provides a rich, controlled, realistic decision-making environment, the "how" of executive decision-making should be ascertained. The interviews were analyzed to accomplish this purpose.

Basis for analysis. The basis for analysis was essentially "content analysis" as devised by Berleson.⁵⁷ Content analysis, according to Berleson, proceeds in terms of what is said, and not why the content is as it was said. Three assumptions are made by Berleson:⁵⁸

1. Content analysis assumes that inferences about the relationship between intent and content or between content and effect can be validly made, or the actual relationship established.

2. Content analysis assumes that the study of the manifest content is meaningful; and

3. Content analysis assumes that frequency of occurrence is important and meaningful.

Berleson's method outlines a simple basis for categorizing verbal responses.

Analysis procedure. Each written interview was scanned for words, phrases, or sentences which pertained to the executive's behavior during the reported decision-making process. A carbon copy of each executive's interview was typed on different colored papers. These comments were cut out of each colored copy and placed face up on a large table. There were 154 of these "comment strips". The comment strips were initially grouped into six behavior

⁵⁷Bernard Berleson, Content Analysis in Communication Research (Glencoe, Illinois, the Free Press Publishers, 1952).

⁵⁸Ibid., pp. 18-20.

categories. Each category was conveniently titled and numbered. The results of this initial analysis are presented in Table I.

TABLE I
INITIAL CATEGORIZATION
OF "COMMENT STRIPS"

C A T E G O R I E S		E X E C U T I V E										C A T E G O R Y
		A	B	C	D	E	F	G	H	I	J	
I	What is the Problem?	4	0	2	1	0	0	2	0	1	0	10
II	Information Seeking	21	9	19	5	6	8	12	6	4	5	95
III	Generation of Alternatives	2	0	4	0	2	1	2	1	2	1	15
IV	Consideration of Outcomes	6	0	0	0	1	2	0	0	0	0	9
V	Evaluation of Information	6	0	2	3	0	1	1	0	1	0	14
VI	Pressure for Decision	2	1	2	1	0	2	1	0	0	2	11
GRAND TOTAL OF CATEGORIZED COMMENTS											=	154

Reconsideration of the organization of Table I indicated that further simplification was possible. This was accomplished by reducing the number of categories to three. The reduction is shown in Table II. Reduction of the number of categories simplified the analysis. No loss of behavior description resulted from this procedure. It is apparent that behavior concerned with "determining the problem" (Category I, Table I) is information-seeking behavior.

TABLE II
 RECATEGORIZATION
 OF "COMMENT STRIPS"

C A T E G O R I E S	E X E C U T I V E										C A T E G O R Y T O T A L
	A	B	C	D	E	F	G	H	I	J	
I Information Seeking and Receiving	27	10	23	7	6	10	15	6	5	7	116
II Information Evaluation	12	0	2	3	1	3	1	0	1	0	23
III Generation of Alternatives	2	0	4	0	2	1	2	1	2	1	15
GRAND TOTAL OF RECATEGORIZED COMMENTS =											154

"Environmental pressure for decision" (Category IV, Table I) refers to deadlines for decisions, supervisory pressure to make a decision, pressure to initiate decision-making behavior, etc. These pressures are obviously perceived by the decision-maker and this perception is information-receiving. "Consideration of outcomes of decisions" (Category IV, Table I) is information-evaluation behavior. The logic of placing Categories II, III, and V of Table I into Table II is obvious. The reduction is illustrated in Figure 1.

Interpretation of the final analysis (Table II).

Caution was necessary in interpreting the contents of the interviews. First, it could not be assumed that the frequency values reported in Table II represent the amount of time an executive spends in the behaviors listed in each

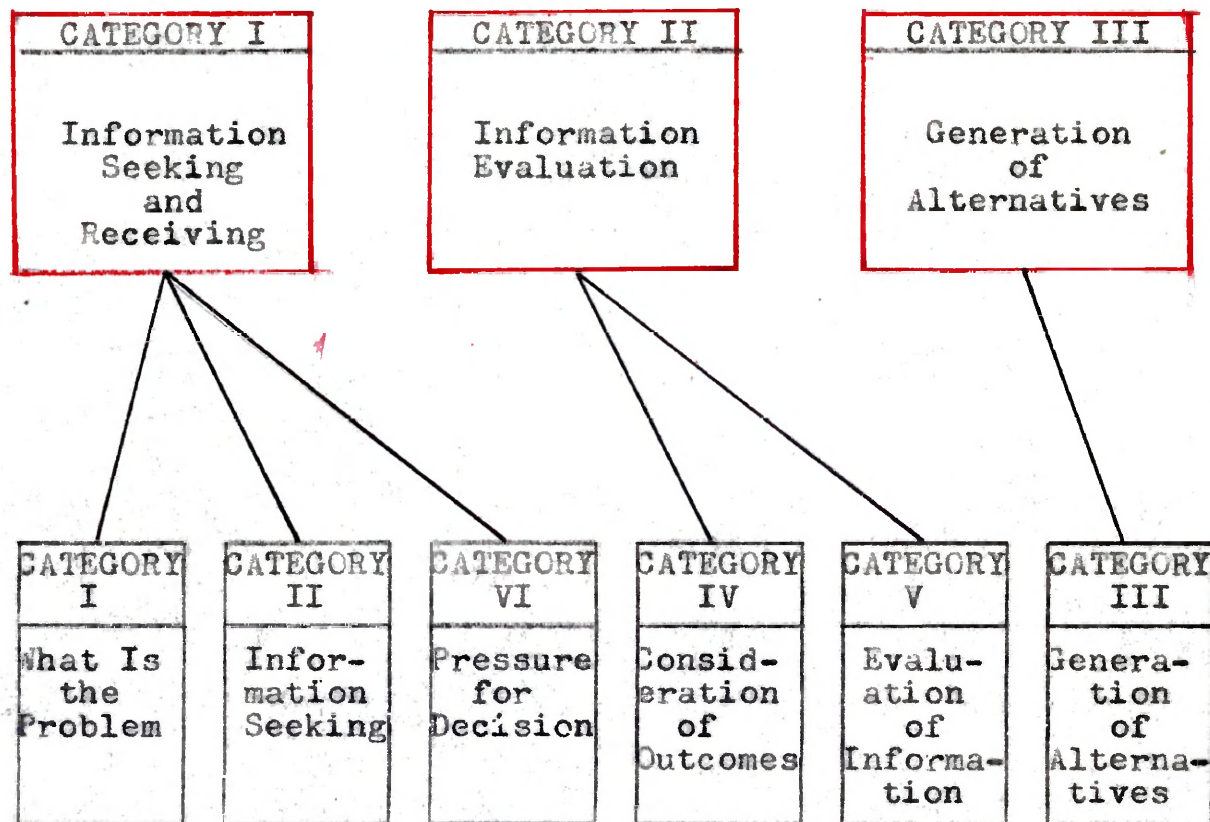


Figure 1. Illustration of reorganization of six categories shown in Table I into three categories shown in Table II. Black border indicates categories shown in Table I. Red border indicates categories shown in Table II.

category. Logically, all that may be said in this regard is that a particular executive emitted a certain frequency of comments in Category I, Category II, and Category III. Executive "A", for example, emitted comments in Categories I, II, and III in approximate ratio of 14, 6, and 1. This did not mean that Executive "A" emitted 14 times as much Category I behavior as he does Category III behavior, or twice as much Category I behavior as Category II behavior. Consider also Executive "B". It could not be asserted that "B" emitted an infinitely greater amount of Category I behavior

than he does Categories II and III behavior, nor can it be asserted that a zero frequency means that an executive spends no time in that particular category of behavior. It was just as reasonable to assume that he failed to mention this category of behavior during the interview.

It is not meaningful, to compare rigidly the frequency of comments in each category by executives. For example, Executive "F" cannot be said to have emitted twice as many Category I acts as did Executive "I".

The frequency totals of Categories I, II, and III, are in the approximate ratio of 6, 1 and 1, respectively. It could not be assumed that the average executive decision-maker engaged in Category I behavior approximately six times more often than he engaged in Category II or III behavior. The reason for these cautions is manifest, since the interview comments of Executive "A" may refer to his behavior over a one year period, while Executive "J" is referring to his behavior over a two week period. The number of decisions and the environmental conditions of each executive are not controlled and cannot be equated. Consequently, analysis and interpretation lacks the precision one might expect to find in a carefully controlled experiment.

It is apparent that executives in this study do engage in similar decision-making behavior patterns, i.e., some degree of generalization of decision-making behavior is apparent regardless of the executives particular decision-

making environment. All executives interviewed reported engagement in "Information Seeking and Receiving" behavior. (Category I, Table 2) Seven out of ten executives reported "Information Evaluation" behavior (Category II, Table II), and eight out of ten reported "Generation of Alternatives" behavior.

Summarily, then, three categories of decision-making behavior are reported. They are:

1. Information seeking and receiving behavior.
2. Information evaluation behavior.
3. Generation of alternative courses of action behavior.

It appears that if a game is to be designed to provide a rich, controlled environment for observing executive decision-making behavior, it should "set the stage" for emission of these three categories of behavior. This will be discussed further in the next chapter.

CHAPTER IV

THE OPERATIONAL GAME

In the first chapter a need is indicated for an economical means of observing and analyzing executive decision-making behavior. Operational gaming may meet this need if the game presents enough of the real life decision-making environment to "set the stage" for emission of decision-making behavior. The attempt to mirror real life is at the heart of operational gaming, according to Andlinger⁵⁹. However, little would be gained by using operational games for the purpose of observing decision-making behavior if the game were as complex as the decision-making environment in the actual business world. The game to be discussed in this chapter permits simple, economical observation of information seeking and receiving, information evaluation and generation of alternatives.

I. GAME ILLUSTRATION AND DESIGN

The game is illustrated photographically, inasmuch as its bulk prevents inclusion. The component parts of the game are not numbered in the photograph since they are easily ascertained by cursory inspection.

⁵⁹G. R. Andlinger, "Looking Around" Harvard Business Review, 36: 147-50, July-August, 1958.

The game is composed of 5 basic parts:

1. Staff Description Cards
2. Information Cards
3. Playing Chits
4. The Playing Board
5. Instructions

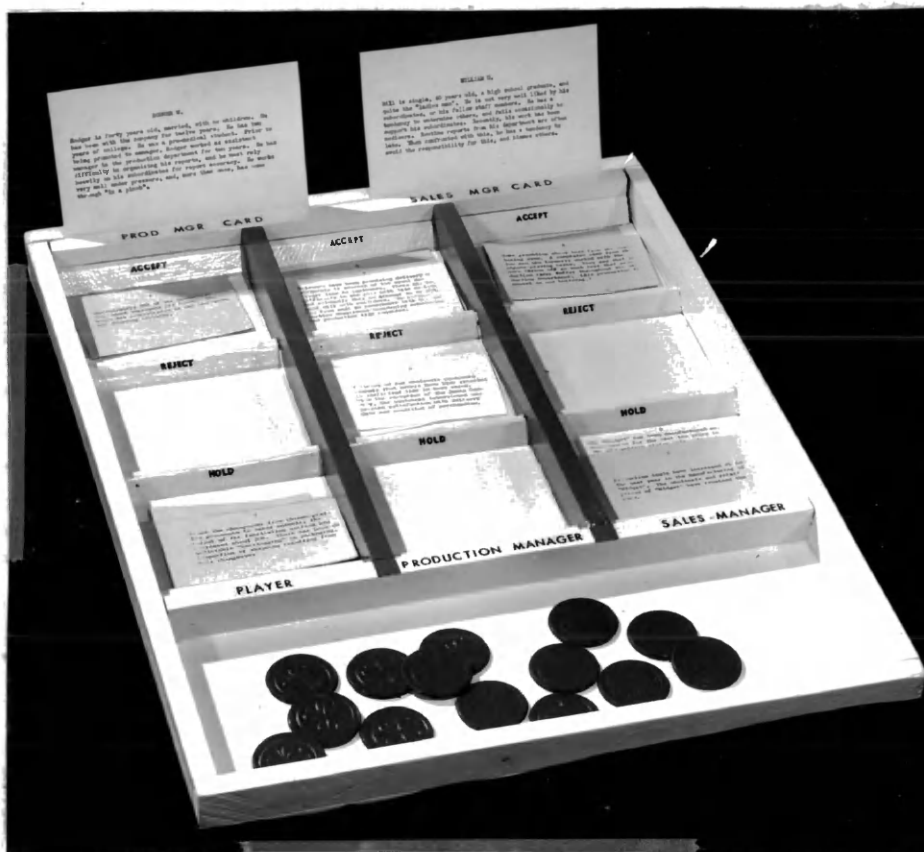


Figure 2. The operational game playing board and its component parts

Part 5 is not shown in Figure 2. It is illustrated and discussed in Section II of this chapter.

Basic considerations in designing the game. Economy is the basic consideration. Consequently, all components are simple and easy to reproduce. The game is flexible and may be easily modified if the individual so desires. No special equipment for observation or computation is required. The game may be played in any classroom, office or laboratory and recorded observations are easily accomplished with scratch paper and pencil. Reference to Figure 2 shows the playing board as being made of wood. Experimentation has shown that a hand-drawn, lettered cardboard sheet will suffice for play, and is less costly. The cards used in the game may be made of ordinary "5 x 8" and "3 x 5" white cards, and may be typed either individually or stenciled. Both methods have been found satisfactory. Playing chits may be any coinage of the realm, poker-chips, checkers, pieces of cardboard, etc.

The second important consideration is "realism." The game should include the elements which were ascertained to be important, viz., information seeking and receiving, information evaluation, and generation of alternatives. The game must be real enough to challenge the player. He should become "ego-involved." Observation by the experimenter of players in action, indicates that the game is ego-involving. Further observation indicated that the player actively engages in information seeking and receiving, information evaluation, and generation of alternatives.

The number of different alternatives generated by a player was selected as a measure of the richness of the game. The game would satisfy the imposed criterion of "richness" if the player generated several alternatives. To test this, seventeen students in a business management class played one session of the game. These students seemed specially desirable, since they had been playing business games all semester and they exhibited considerable interest when initially queried. The students were asked to indicate alternative courses of action on a sheet of paper. These sheets were collected and a tally made of the different alternative courses of action generated by each player. Difference in courses of action per player was determined by the author. The results are presented in Table III. The total number of alternative

TABLE III
NUMBER OF PLAYERS GENERATING
VARIOUS FREQUENCIES OF ALTERNATIVES

FREQUENCY of ALTERNATIVES	NUMBER of PLAYERS
5	4
4	8
3	5

courses of action generated among the group was 67. When a pooled comparison of these decisions was made it was found that 19 of the alternatives were ostensibly different. This

was another indication that the game provides a rich decision-making environment.

The modal number of alternatives generated is four. cursory inspection of the data in Table III indicates that the values cluster about the mode. In the absence of any evidence for comparison, the number of alternatives generated in this sample seems satisfactory.

The last basic consideration in design is playing time. cursory observation of players in action indicates a modal playing time of about one hour. Occasionally a player completes the game in as little as twenty-five minutes or as much as eighty minutes, however these occasions are rare. Naturally, playing time is a function of many factors, and as yet, these are not known with any degree of exactness.

An outline of the game action. Two people constitute a playing team. One member is the observer whose function is to observe the player in action and govern the play. The other member of the team is the player who functions as the decision-maker. The action involves the operation of a fictitious firm. The player is informed of the firm's organizational structure, its history and the current business situation. The player assumes the part of the general manager of the firm. His staff consists of a sales manager and a production manager, who report directly to him. The observer selects these two staff members from a population of nine

individuals. Each of these nine individuals is described on a "5 x 8" card.

Information is received from customers, the sales department and the production department. These three information sources are represented by three sets of ten "3 x 5" cards, making a total of thirty cards. Each card contains different information.

The general objective of the play is to discover the problems in the situation and generate alternative courses of action.

Staff description cards. Each of nine staff members is named and described on a "5 x 8" white card. The names and descriptions are fictitious. These nine cards are shown in Appendix C. The observer selects two of these cards and places them on the playing board as is shown in Figure 2. The two cards are illustrated in Figure 2 as they appear to the player during play. Thirty-six staff combinations are possible since the two cards used in playing the game come from a parent population of 9 cards.

Executives "A", "B", "C", "D", "E", "F", "G" and "J" reported that they consider the credibility of a person who provides them with information as well as considering credibility of the information, per se (Appendix B). Use of a parent population of nine cards may provide more opportunity to test this reported behavior. The game is flexible enough

to permit reduction of the parent population of cards to a number not less than two, and the population may be increased if desired by producing more cards.

Twenty-eight military executives who were members of a Personnel Psychology Class at Kansas State University independently ranked the nine cards in order of their desirability as a staff member.

The rating sheet and the instructions for its completion appear in Appendix D. The data resulting from this procedure appear in Appendix E. These data were analyzed to determine the degree of agreement among the assigned ranks of the cards by computing Kendall's Coefficient of Concordance (W). This value was .368 and was statistically significant ($F = 15.72, P < .01$).⁶⁰ This indicates at least a modicum of agreement among the twenty-eight raters. Individual differences among raters may account for some of the disagreement.

Detailed instructions for the use of these cards during play appear in Section II of this chapter.

Information cards. Thirty information cards are included in the game and are presented in Appendix F. Table IV shows the color coding system and other descriptive data.

In each of three sets there are ten cards. Each set

⁶⁰Solomon Diamond, Information and Error (New York: Basic Books, Inc., 1960)

TABLE IV
 COLOR CODING SYSTEM OF
 INFORMATION CARDS

CARDS ARE COLORED:	INFORMATION SOURCES ARE:	CARDS ARE NUMBERED:
WHITE	CUSTOMERS	1-10 inc.
YELLOW	SALES DEPARTMENT	1-10 inc.
GREEN	PRODUCTION DEPARTMENT	1-10 inc.
TOTAL AMOUNT OF CARDS = 30		

is colored differently as indicated in Table IV and Appendix F.

The color indicates the source of the information on each card. Cards are numbered 1 through 10 inclusive, by source, for easy identification. Each of the thirty cards contains a different item of information.

Specific instructions for use of these cards during play are given in Section II of this chapter.

Playing chits Forty-eight playing chits are used in the game. Several of these playing chits are shown in Figure 2. The chits constitute an information expenditure fund. The player pays or forfeits a predetermined amount of these chits each time he receives an information card.

Section II of this chapter presents detailed instructions for use of these chits during play.

Playing board. The author constructed the playing

board. Construction time was approximately twenty man hours.

The bill of materials is shown in Appendix G. The dimensions given therein are approximate. The ingenious reader can easily reproduce a playing board of similar design.

The board's overall dimensions are approximately $19\frac{1}{2}$ " x $15\frac{1}{2}$ " x $1\frac{1}{4}$ ". Notice that the upper edge of the board is slotted for upright placement of the staff description cards. Each of the sections marked ACCEPT, REJECT and HOLD, measure approximately 4" x 5" and accommodate information cards. Two red strips separate the player, production manager and sales manager sections of the board. (These appear as dark strips in the photograph.) The block letters are heat resistant, paraffin-backed and self-adhering, and come in large sheets. Each letter is cut out of the sheet, placed in proper position, and is adhered by rubbing the surface of the letter with a smooth metal instrument. (A table knife handle works very well.)

II. GENERAL INSTRUCTIONS FOR PLAY

The first part of this section presents player instructions and the second part presents observer instructions. These two sets of instructions should be reproduced separately. The advantages of separate instructions will become apparent to the reader as he studies them.

Player instructions. The following instructions are to be read by the player.

PLAYER INSTRUCTIONS

As an executive, you are aware of the difficulties in decision-making. No matter how hard you try, you seldom, if ever, can collect all the information about a situation which requires a decision. You are often limited by funds and facilities. You must meet deadlines. Regardless of these difficulties, you do make good decisions.

Scientists are searching for a better understanding of decision-making processes. Observation of decision-makers in action is one approach to gaining more insight into decision-making. However, observation in the work situation is difficult and often prohibitively expensive. Operational games are sometimes used as an economical means of observing executives in action. This is such a game.

Operational games are not toys. They simulate the real world insofar as possible. The game you are about to play has been designed specifically for executives. You will find the game interesting and challenging. It will take about one hour of playing time.

The game is not a test. Your "output" is not being measured. The game has no correct solution and there are no right or wrong answers.

Throughout the game, an observer will remain with you. He will answer questions and guide the play. From time to time, he may give you instructions and ask questions.

The Situation

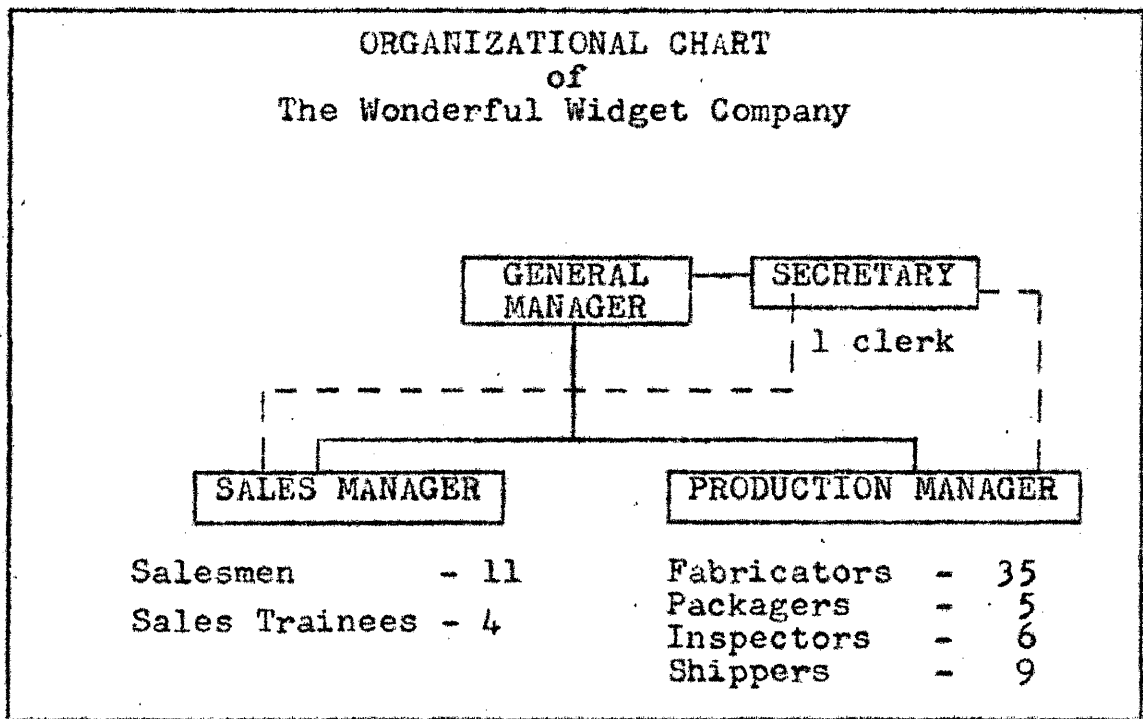
You will assume the role of General Manager of the Wonderful Widget Company. The firm was founded in 1920 as a partnership, and was incorporated in 1942.

The "Widget" is a common kitchen item which sells at a retail price of \$2.98. The company manufactures the "Widget" and distributes it in North Dakota, South Dakota, Nebraska, Colorado

and Kansas.

The basic design of the "Widget" has not changed since 1940. Since its appearance on the market, the "Widget" was manufactured in one chrome-plated model. Last year the chrome-plating was replaced with various colors of enamel.

As General Manager, you are responsible for all operations of the business including production, sales, personnel hiring, purchasing, advertising, public relations and training. The Sales Manager and Production Manager report directly to you. The organizational chart shows pertinent data:



The solid line indicates normal "chain of responsibility" and normal communication routes. The dotted lines indicate a communication route.

The general functions of those persons who report directly to you are as follows:

POSITION	FUNCTIONS
SECRETARY	"Girl-Friday"
SALES MANAGER	Sales, distribution customer liaison
PRODUCTION MANAGER	Raw materials supply, fabrication, design, packaging, inspection and shipping.

YOU HAVE JUST RECEIVED THE MONTHLY SALES REPORT, WHICH INDICATES THAT SALES ARE DOWN 30% FROM LAST MONTH

Please take as much time as you need to study the above instructions. When you have finished, the Observer will explain how the game is played.

Instructions for play. The instructions for play should be read to the player. This provides an opportunity to establish rapport and adds a personal touch to the relationship between player and Observer. During the play, you should answer questions the player might have concerning rules of play, procedure, etc. It is important that you do not provide informational cues, e.g., do not amplify or clarify information in the "situation", on the cards, etc. The player is "on his own."

Present the following introductory material as soon as the Observer and player have met:

INTRODUCTION

You and I make up a playing team. You will be the more active member of the team. I will observe the action in the game, and play

a few minor roles. You will play the major role in this game...that of the decision-maker. You are called the Player. I will be referred to throughout the game as the Observer. After reading this material, we will proceed with the game. (Observer hands Player the sheet of PLAYER INSTRUCTIONS.) When the Player has finished reading, you present the INSTRUCTIONS FOR PLAY.

INSTRUCTIONS FOR PLAY

You have studied the situation, and we are now ready to play the decision-making game. (At this point, bring out the game board and its components.) This is the playing board and its components.

In the instructions you were told that you are the General Manager and that you have a staff...a Sales Manager and a Production Manager. I will now assign your staff. (Select two staff description cards and place them on the board, facing the player.) These cards describe your staff. Notice that their jobs are indicated by the symbols, "PROD MGR CARD" and "SALES MGR CARD." Take a few minutes to study these descriptions. (Allow as much time as is necessary here.)

Notice the three stacks of cards, each colored differently. (Show the cards, briefly to the player, then remove the cards from the Player's sight. Do not indicate, in any manner, the number of cards remaining.) The yellow cards represent information from the sales department, the white cards represent information from customers and the green cards represent information from the production department. You may gather information from these sources, and in addition you will receive information from these sources from time to time. You may gather or receive only one information card at a time. To gather information, simply tell me from which source you want information, and I will provide the information card. You, as General Manager, may gather information from any source. You may gather the information yourself, or you may direct a staff member to get the information. This procedure is not without cost,

however. (At this point, place 48 playing chits on the board in the place provided.) I have just given you 48 chits. This is your "information expenditure fund". You must forfeit chits every time I hand you an information card. If you, as General Manager, personally gather the information, the cost is two chits per card. If you direct either the Production Manager or Sales Manager to get the information for you, the cost is one chit per card. This is realistic, since your time is more costly than the time of a member of your staff. As Observer, I may hand you a card without your having asked me for it. In this case, I will be playing the part of either your Sales Manager or Production Manager. I will tell you which part I am playing each time, and you must forfeit one chit per card. To recapitulate for a moment...information comes to you three ways: First, you as General Manager may gather it from any source, at a cost of two chits per card. Second, you may direct a staff member to gather it, at a cost of one chit per card. Third, a staff member may bring information to you "on his own," i.e., without your directions to do so.

Notice the other components of the board. (pointing to specific parts as you explain them) First, notice the three sections entitled "PLAYER", "PRODUCTION MANAGER," AND "SALES MANAGER." These sections are separated by two red strips. The information cards are placed in these compartments. The titles indicate the person who has provided the information, not the source of information. For example, if the "PRODUCTION MANAGER" gets an information card...either voluntarily or at your instructions...the card will be placed in the section labeled "PRODUCTION MANAGER." The red lines remind you that you must not move cards laterally, i.e., from one section to another.

The three sections which are separated by the red lines, contain three compartments each, which are labeled, from top to bottom, ACCEPT, REJECT, and HOLD, respectively. (point to each compartment)

After studying an information card, you must place it in a compartment. If you believe the information on the card, and feel that it

is applicable, you might place it in the "Accept" compartment. If you disbelieve the information, you might place it in the "Reject" compartment. If you are undecided, you might wish to place it in the "Hold" compartment. This procedure must be followed for each card, and you may not get another card until you have placed the card in the compartment you deem most appropriate. You may, at any time during the game, change the cards from one compartment to another.

As you can see thus far, the game centers around gathering and evaluating information. You may take as long as you wish to gather and evaluate information, with one exception. If and when your supply of chits is exhausted, information gathering and receiving must cease. However, you may continue to evaluate the information already received.

When you have completed your evaluation of the information, you must generate alternative courses of action. Write these courses of action on the sheet of paper I will provide for you (plain paper is fine) and rank your alternatives in order of desirability; one, being the most desirable, two, less desirable, etc. Ties are permitted. The number one alternative indicates that you would most likely initiate this course of action. This completes the play.

Remember that I may ask you questions during the play...this is not a test of your ability...There are no right or wrong answers. Do you have any questions?

LET'S PLAY THE GAME!

Special Observer instructions. This section should be reproduced separately, and kept in the possession of the observer, since it pertains to manipulations which the observer performs.

OBSERVER OPERATIONS

1. To assign the staff - preselect the cards; or

for random selection, shuffle the cards and draw two.

2. To set up the information cards - arrange them in predetermined order, and record them by color and number as they are given to the Player; or, for random selection, shuffle each set, then record them by color and number.
3. To act as a staff member - this may be done arbitrarily by the Observer. However, in real life, your assistants might report to you voluntarily at most any time, i.e., the procedure is of a random nature.

The procedure that follows is a random one, using a Random Numbers Table. Any other system of randomization will do as well.

Let the Player receive one information card. Consult the table, find a zero in any row, and mark it. This is your starting point. The next number in the row is the number of the play where you act as a staff member. Mark this number, then count the plays made by the Player. For example, if this number was four, let the Player make three plays, then interrupt him, and play the part of a staff member on the fourth play. The next number in the row determines which staff member's part you will play. If the number is even (0,2,4,6,8), play the part of the Sales Manager. If the number is odd, (1,3,5,7,9), play the part of the Production Manager.

Other systems of randomization may be adapted easily, at the OBSERVER'S CONVENIENCE.

4. What to do if a stack of information cards is exhausted - If you discover that a pile of cards is exhausted, you simply draw from the remaining stacks. If this happens and the player calls for a card from the exhausted stack, tell him that the source has been exhausted. Offer no other explanation!

CHAPTER V

SUGGESTIONS FOR RESEARCH

SUMMARY AND CONCLUSION

I. FUTURE RESEARCH IN OPERATIONAL GAMING AND DECISION-MAKING

Certain possibilities for future research have become apparent but were beyond the scope of the present study. These possibilities are set forth as questions. The answers are not known to the author. It is hoped that the study will suggest other ideas for research to the reader.

Influence of game factors. To what extent is the player influenced by game factors? Does he play the game as intended or does he try to "beat the game"? If the game sets the stage for more of this type of behavior than behavior in the real world, much of the purpose of the game will have been lost. If he reacts to the game as a test, does this influence his observed game behavior?

Card colors and preference. Is there a tendency for a player or players to prefer one color of information card over another? If color does influence the player, can this influence be used as a predictor of decision-making behavior?

The game as a test. Can the game be used as a selection device for future executives? How pure is the game as a measure of the "decision-making factor"? What factors, already known, does the game measure, and how much of each factor?

Number of cards studied. Is there a relation among the number of cards evaluated by the Player and the number and kind of alternatives generated? Is there a tendency for the Player to gather all the cards he possibly can?

Staff description cards and credibility. To what extent is the Player's information evaluation behavior affected by information contained on the Staff Description Cards? Does the decision-maker evaluate the source of information, whether the source be a card, a machine, or a person? What is the relation between degree of belief of the reporter and the information reported? If a decision-maker evaluates information sources for credibility, what criterion does he use?

Sequential effects of information. To what extent is decision-making behavior affected by preceding information? Does information contained on a card affect subsequent information gathering and evaluation? Are information items combined additively or are items of information treated as being related or dependent?

"Goodness" of alternatives. What is a good course of action? Is there a right course of action? Can alternatives generated in this game be so evaluated? If so, what criterion is suitable to make this judgment? Perhaps it is better to ask: Are some courses of action better than others, considering the circumstances?

Background differences and game behavior. Experienced executives and inexperienced college students have been used to develop this game. Does the behavior generated in the game differ between the two groups?

Influence of instructions on the play. How do the instructions influence the play? Would less definite instructions add to or detract from the richness of the game behavior?

II. SUMMARY AND CONCLUSIONS

An operational game has been presented as a means for observing executive decision-making behavior. In designing the game, the underlying assumption was that meaningful observations of decision-making processes are possible by providing a rich, controlled environment, which will "set the stage" for emission of decision-making behavior.

Executives were interviewed and the interviews were analyzed in order to ascertain certain essential elements

in decision-making behavior. The game has been designed with these behavioral elements as its basis. The elements were:

1. Information gathering and receiving
2. Information evaluation
3. Generation of alternative courses of action.

The game may be reproduced economically. It is flexible and simple in design.

Observation by the author of players in action, indicates that the game is ego-involving. It is concluded that the game does set the stage for emission of certain essential elements of decision-making behavior as herein defined.

BIBLIOGRAPHY

A. BOOKS

Barnard, Chester I. The Functions of the Executive. Cambridge, Mass.: Harvard University Press, 1948.

A general discussion of executive functions and the process of decision-making by a noted executive and university lecturer.

Berleson, Bernard. Content Analysis in Communication Research. Glencoe, Ill.: The Free Press, 1952.

A discussion of content analysis and its use in research.

Bruner, Jerome S., Jacqueline J. Goodnow, and George A. Austin. A Study of Thinking. New York: John Wiley and Sons, Inc., 1956.

A discussion of thinking processes, environment, probabilistic cues, uncertainty in decision-making, and primary considerations in problem-solving and decision-making. Specific reference to Chapter 7, "Categorizing with Probabilistic Cues."

Campbell, William Giles. Form and Style in Thesis Writing. Boston: Houghton Mifflin Company, 1954.

A comprehensive coverage of thesis and dissertation format by an authority in the field.

Cronbach, Lee J. Essentials of Psychological Testing. Second edition. New York: Harper and Brothers, 1950.

A comprehensive coverage of psychological measurement. Specific reference to discussion of validity.

Diamond, Solomon, Information and Error. New York: Basic Books, Inc., 1960.

This is a text of applied statistics. Specific reference is made to Chapter 13, "Handling Nonnormal Data", Kendall's Coefficient of Concordance (W), and a suitable test of significance of (W) is discussed.

Drucker, Peter F. The Practice of Management. New York: Harper and Brothers, 1954.

A discussion of the tasks of the executive in business by a noted authority. Specific reference to Chapter 28, "Making Decisions", in which differentiation is made between decision-making and problem-solving.

Guilford, J. P. Personality. New York: McGraw-Hill Book Company, Inc., 1959.

A comprehensive survey of personality. Specific reference to the discussion of the "conceptual foresight" factor and its relation to leadership.

Herron, Lowell W. Executive Action Simulation. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1960.

A manual of instructions and discussion of a decision-making business game. The game serves as a training device for executives.

Jones, Manley Howe. Executive Decision Making. Homewood, Ill.: Richard D. Irwin, Inc., 1957.

A discussion of key problems in executive decision-making.

Luce, R. Duncan, and Howard Raiffa. Games and Decisions: Introduction and Critical Survey. New York: John Wiley and Sons., Inc., 1957.

A survey of game theory and its applicability to decision-making by two well-known authorities.

Shartle, Carroll L. Executive Performance and Leadership. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1956.

A discussion of leadership. Specific reference to the comments on application of experimental procedures to analysis of executive decision-making behavior.

Siegel, Sidney. Nonparametric Statistics. New York: McGraw-Hill Book Company, Inc., 1956.

A text of "distribution-free" statistical procedures by an authority in the field of statistics. Specific reference to the discussion of Kendall's Coefficient of Concordance (W).

Simon, Herbert A. Administrative Behavior. Second edition. New York: The MacMillan Company, 1957.

A discussion of decision-making in the organizational environment.

Sisson, Roger L., and Jay R. Greene. Dynamic Management Decision Games. New York: John Wiley and Sons, Inc., 1959.

Seven non-computer business games are described with emphasis upon game design and educational value of decision-making games.

Tiffin, Joseph, and Ernest J. McCormick. Industrial Psychology, Fourth edition. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1959.

A text in industrial psychology. Specific reference

to the comments on "theme analysis" and decision-making processes.

Vance, Stanley. Management Decision Simulation. New York: McGraw-Hill Book Company, Inc., 1960.

A non-computer business game to be used as a classroom device to provide practical management development training.

Wasserman, Paul, and Fred S. Silander. Decision-Making: An Annotated Bibliography. Ithaca, New York: Cayuga Press, Inc., 1958.

A survey of recent literature in the fields of game theory and decision-making with annotations on each reviewed publication.

B. PERIODICALS

Andlinger, G. R. "Business Games--Play One," Harvard Business Review, 36: 115-25, March-April, 1958.

A pioneer and noted authority in the field of business games describes widely used business games designed by himself.

_____, "Looking Around", Harvard Business Review, 36: 147-50, July-August, 1958.

An evaluation of the problem solving and teaching type business games. The author suggests using games as predictive devices for executive performance and research.

Bates, James A. "A Model for the Science of Decision", Philosophy of Science, 21:326-39, 1954.

The author discusses von Neumann's "Game Theory" and presents a formal model for a science of decision.

"Blueprinting the Next Ten Years of Industrial Psychology", Personnel Psychology, 12: 29-48, December, 1959. (A Symposium).

Dr. Jack W. Dunlap, Dr. Raymond Katzell, Dr. Carroll L. Shartle, Dr. Robert L. Kahn, and Dr. C. H. Lawshe discuss vital problems in industrial psychology and the trend of developments with predictions for the future.

Browne, C. G. "Study of Executive Leadership in Business", Journal of Applied Psychology, 34: 82-7, April, 1950.

A discussion of the influence of goals, purposes, objectives, and communications on decision-making.

Cartwright, D. "Relation of Decision Time to the Categories

of Response", American Journal of Psychology, 64:174-96, 1941.

As a result of his investigation, the author concludes that increases in decision time are produced by conflict between response alternatives.

_____, and L. Festinger. "A Quantitative Theory of Decisions", Psychological Review, 50:595-621, 1943.

A discussion of a decision theory concerning a mathematical quantification combining vector analysis and topological analysis.

Cerami, Charles A. "You Can Sharpen Your Thinking", Nation's Business, 46:34-5+ November, 1958.

The author points out the danger of blindly repeating alternatives that have led to past success in decision-making.

Cohen, John. "Subjective Probability", Scientific American, 197:73-8, November, 1957.

A discussion of subjective probability and its implications for decision-making.

Coombs, C. H., and S. S. Komorita. "Measuring Utility of Money through Decisions", The American Journal of Psychology, 71: 38-89, June, 1958.

The authors test an individual's preference among bets at given expected values from their preferences among bets at two other expected values. The authors suggest that subjective expected value of a bet may not be the only factor entering into a decision to bet. Utility for risk may enter into the decision.

Dale, Ernest. "New Perspective in Managerial Decision-Making", Journal of Business, 26:1-8, 1953.

A classification of decisions and suggestions as to the causes for uncertainty in business decisions.

Drucker, Peter F. "How to Make a Business Decision", Nation's Business, 44:38-9+, April, 1956.

A noted authority in the field of business points out that management will continue to emphasize the need for research in decision-making.

_____, "Thinking Ahead", Harvard Business Review, 37:26-30+, February, 1959.

The author emphasizes the need for research in the managerial field to enable managers to make decisions more rationally.

Edwards, Ward. "The Theory of Decision Making", Psychological Bulletin, 51:380-417, 1954.

A review of mathematical and statistical decision-making theories and a discussion of the concept of "utility".

Feather, N. T. "Subjective Probability and Decision-Under Uncertainty", Psychological Review, 66:160-64, May, 1959.

A discussion of the use of "subjective probability" in the decision-making models of Lewin, Tolman, Rotter, Atkinson, and Edwards.

Forrester, Jay W. "Industrial Dynamics: A Major Break-through for Decision Makers", Harvard Business Review, 36:37-66, July-August, 1958.

A discussion of the shift of emphasis from tactical to strategic decision-making.

"In Business Education, the Game's the Thing", Business Week, pp. 56-8, July 25, 1959.

A discussion of a production scheduling game, for use as an executive training device, developed by the Procter and Gamble Company.

Haire, Mason. "Psychological Problems Relevant to Business and Industry", Psychological Bulletin, 56:169-94, May, 1959.

The author discusses problem areas of personnel, industrial-social, and engineering psychology. Theory of games and strategic decision theory is also discussed and their limitations noted.

Katona, George, and James N. Morgan. "The Quantitative Study of Factors Determining Business Decisions", The Quarterly Journal of Economics, 66:48-54, 1952.

A discussion of the problem of gathering decision-making information using the interview method.

"Light on Deciding", Business Week, pp. 184-5+, April 13, 1957.

A discussion of the work of Professor Herbert Simon in the field of executive decision-making.

McDonald, John. "How Businessmen Make Decisions," Fortune, 52:84-7, August, 1955.

A discussion of the businessman's and scientist's joint interest in decision-making. Brief interviews with executives concerning the "law" of decision-making.

_____, and Franc Ricciardi. "The Business Decision Game", Fortune, 57:140-2+, March, 1958.

A discussion of the American Management Association business game, "Top Management Decision Simulation."

Middleswart, Frank F. "Operations Research: What it is and How you can use it," Office Executive, 34:30-2, March, 1959.

A discussion of the advantages and limitations of Operations Research.

Siegel, Sidney. "Level of Aspiration and Decision Making," Psychological Review, 64:253-61, July, 1957.

A discussion of the role of a person's level of aspiration in his decision-making behavior.

Strong, Lydia. "Everyday is Doomsday: Ordeal of Executive Decision," Management Review, 44:746-55, November, 1955.

A proposal of three levels of decisions.

Toda, Masanao. "Information-Receiving Behavior of Man," Psychological Review, 63:204-12, March, 1956.

The author discusses the importance of assessment of subjective probabilities in human behavior and suggests a modification of the Shannon-Weaver equation.

C. PUBLICATIONS OF THE GOVERNMENT, LEARNED SOCIETIES, AND OTHER ORGANIZATIONS

Kennedy, John L., Gaming Theory and Its Relation to Industrial Psychology, Princeton, N. J.: Princeton University, 1959.

The author discusses operational gaming and its implications for industry and psychological research.

Newton, John M. GAMBIT: A Tactical Training Game for Armor Platoon Leaders. Groton, Conn.: General Dynamics Corporation Electric Boat Division, 1959.

A manual for a tactical decision-making game with complete instructions and materials for play. (illustrated)

Ward, Lewis B. The Business In-Basket Test: A Method of Assessing Administrative Skills. (RB-59-8), Educational Testing Service, 1959.

A discussion of a device for evaluating an individual's ability to perform certain managerial tasks.

D. ESSAYS AND ARTICLES IN COLLECTIONS

Coombs, C. H., and David Beardslee. "On Decision Making under Uncertainty," Decision Processes. New York: John

Wiley and Sons, Inc., 1954. Pp. 255-85.

A discussion of psychological variables in decision making under uncertainty.

Festinger, Leon. "The Relation between Behavior and Cognition," Contemporary Approaches to Cognition. Cambridge, Mass.: Harvard University Press, 1957. Pp 127-50.

A discussion of dissonance and information-seeking behavior.

Johnson, Donald M. "Thinking," Psychology and Life. Fifth edition. Chicago: Scott Foresman and Company, 1958. Pp. 544-47.

A discussion of the renewed interest in decision-making, and profitableness of observation of thinking behavior.

Roy, A. D. "The Empirical Testing of Alternative Theories of Uncertainty," Uncertainty and Business Decisions. Liverpool, Eng.: Liverpool University Press, 1957. Pp. 75-88.

The author emphasizes the need for studies of decision-makers in action.

Watkins, J. W. N. "Decisions and Uncertainty," Uncertainty and Business Decisions. Liverpool, Eng.: Liverpool University Press, 1957. Pp. 107-21.

A noted authority asserts that true decision-making occurs only under conditions of uncertainty.

E. UNPUBLISHED MATERIALS

Kennedy, Paula Lee, and Robert L. Dain. "Project D.K.D.R.T." Unpublished research project, Municipal University of Omaha, Omaha, Nebraska, 1960.

A study of verbalization during problem-solving.

Nicholson, R. W., and W. E. Jaynes. "A Personnel Testing Game." Omaha: Municipal University of Omaha, 1960. (Mineographed.)

A game designed to teach the principles of psychological testing for personnel selection.

Sisson, George, and Donald Triano. "A Study of Decision Making." Unpublished research project, Municipal University of Omaha, Omaha, Nebraska, 1960.

The use of the "free" interview and "structured" interview methods to gather data on decision-making behavior.

APPENDIX A

Job Title and Firm of Executive Interviewees

APPENDIX A

JOB TITLE AND FIRM OF EXECUTIVE INTERVIEWEES

EXECUTIVE *	POSITION OR TITLE	FIRM OR BUSINESS
A	Hospital Administrator	General Hospital
B	Sales and Public Relations Director	Real Estate Development Co.
C	City Planner	City of Buenos Aires, Argentina (also University professor)
D	Assistant District Manager	Telephone Company
E	Office Manager and Personnel Director	Distributor and Manufacturer of Automobile parts, Air-Conditioning and Home Appliances
F	Air Force R.O.T.C. Commandant (Lt. Col., USAF)	University of Omaha Air Force Reserve Officers Training Corps
G	Partner and General Manager	Supermarket Display Equipment Manufacturers
H	Vice President For Personnel	Utilities Company
I	Vice President, Partner	Electrical Contracting Company
J	Part Owner, Member of Board, Vice President	Steel Company
*Names on File in Bureau of Industrial Testing, Municipal University of Omaha		

APPENDIX B

Executive Interviews

EXECUTIVE "A"
HOSPITAL-ADMINISTRATOR

Kinds of Decisions

Equipment purchasing (10¢ to \$30,000)

Hiring and placement

Personnel evaluation

Who is supervisor?

Replace department head

Evaluate reports from department heads

Budget report evaluation

How I make Decisions

Problem - Man wants to join medical staff.

Evaluate form, request information about background,
request evaluation from executive committee. (Colored surgeon.)

Tentative decision was to "shelf" applicant.

Applicant has returned and wants to know why he hasn't been
hired.

I consider now - What am I going to do?

Question - What is going to happen if we bring another colored
doctor on the staff? (We already have one.) What is the
possible effect on the hospital? What impact will influx
of colored patients and visitors have on rest of hospital?

Conclusions - I will have Board of Trustees call meeting of three hospitals to find out what total impact this might have on "hospital industry" and community.

What is impact on colored population? Will we lose good, educated, cultured negro, and still be saddled with the low economic status negro?

Personnel Decision

To keep person or not.

Information gathering - Test man in several jobs. Degrees of credibility regarding information provided by my subordinates.

New Man - I must test man to establish degree of belief. You must know individuals long enough to have empirically tested their credibility.

If I have had experience in area, this enables me to make decision much more easily, of course, experience often "bogs one down", i.e., you should not let past experience interfere with new possibilities.

Decision on Buying Expensive Machine?

Problem - Buy or not to buy?

I ask - cost?, etc.

I consider, patient comes first.

Each of us, in making decisions has a basic philosophy.

Difficult to "make decisions", but got to do it. Consider the outside pressure for decisions. This forces me to make decision.

A NOVEL SITUATION

A man walks in my office and says "I didn't get an X-ray today and I'm very unhappy."

Problem - what to do?

First, I'm pleasant and I listen to his problem. I called nurse and asked about background. Doctor forgot, but I can't tell man this because of ethics. I called nursing director and asked for written report concerning this. I explained that this was due to communication problem. Man left office and was happy.

AGAIN, COMPLAINTS

I must gather facts. I want opinions.

Two heads are better than one. A group of people very often come up with good decisions. Sometimes I consider junior executive development and I accept decisions to encourage them to "think for themselves".

In hospital field, I always ask, how will decisions affect public opinion? I cannot "operate in the red". I must satisfy 33 board members, e.g. we would like to raise wages of our people, but how would this be received by public.

You must justify your decision particularly unto yourself. You must have facts to back you up.

I look for better alternatives.

I do time and motion study, a cost analysis, materials used per case, overhead costs, personnel losses, etc. (this is in regard to subsidy)

What kinds of facts do I need. Whom should I contact? How many people?

1. What do I want to find out?

A. Where are the specific problems?

B. What are the specific problems?

2. Where do I get the facts?

3. How do I get the facts?

4. When do I get the facts? (Considering sampling)

I receive facts. I evaluate facts for: completeness, pertinence, comprehensiveness. Also, I evaluate people who report facts to me.

PRESSURES - business, home, family, wife, community, competition.

EXECUTIVE "B"

REAL ESTATE - DIRECTOR OF PUBLIC RELATIONS AND SALES

Kinds of Decisions

Sales and Public Relations

Merchandising (everything that affects final sale of the home)

Types of Decisions in My Field

1. Personnel Selection - Sales & Secretarial
2. What, When, Where. How to generate sales publicity.
3. Marketing decisions.

How I Make Decisions

1. My yardstick for decisions is business success.

(Profit motive); self-satisfaction; and satisfaction in our work.

2. I make decisions in the interest of our business. No progress without decisions.
3. Decision - making is a necessity in business.

PERSONNEL SELECTION

First, attract applicants for vacancy.

Next interview applicant and give applicant application blank. If I'm still interested, I have lunch with applicant, discuss tests, and "feel him out". I ask man to call Bill Jaynes to make appointment for testing. This evaluates initiative. If I don't receive application blank, I forget man. I check outside sources.

Applicant takes exam. I receive report from Bill Jaynes. If satisfactory, I have man make appointment for interview re: exam results.

I request a credit report.

Then, decide Hire or not hire

I evaluate source credibility on basis of business judgment and experience.

I use group process (a family concern). Retain service of experts.

A GENERAL PROBLEM

A balance in the firm between construction and sales. Interchange of information.

How is profit in the business?

EXECUTIVE "C"
CITY PLANNER

Types of Decisions

Regarding inflow of goods (consumables) into a city.

Location selection and design of supermarkets in neighborhoods in Buenos Aires.

The Problem - choose location and design.

How

Study production and distribution, wholesale and retail possibilities. Availability of land. I consider sites and land availability.

I decide to locate market.

Then, I must decide how to keep neighborhood supplied (if building new location involves destroying old market.)

I must be aware of and consider public pressure upon myself and the city mayor. I must compromise between farmer group pressures and location of markets. i.e., satisfy farmers and aesthetic and health and design demands.

I must decide upon architectural design. Should the supermarket be conventional and fit into the background or should it be different?

Another very important decision was whether to quit my job or not (as city planner).

I evaluate neighborhoods. Density, etc.

Use aerial photographs and census reports.

Consider policies, etc. Get information. I get information on availability of land from members of my staff. I try to select government land (cheaper), otherwise recommend purchase of land.

I divide responsibilities to my staff leaders, and select staff to work with him. I must, e.g., select good leader, good draftsman, etc. on team.

I apply principles of architecture and planning which I have learned. I consult publications by authorities.

A NOVEL SITUATION (Planning)

I define and outline the problem.

What is the end-goal?

For whom am I designing?

I determine degree of similarity between past situations and present situation, and research other sources for information that might shed light on the problem.

I gather information -

Interview sellers and buyers

Officials who will manage market

Thru my staff

My own experiences

(I am compelled to make a decision within a certain period of time.

I had deadlines to meet.)

I choose among three or four alternatives. Of course, we could go on ad infinitum and end up with hundreds of alternatives.

I would evaluate reports from individuals. The mechanics of the report is important.

Presuming that I must choose between reports,

I attach weight to various sources, i.e., I evaluate degree of belief of various reporters or sources of information.

EXECUTIVE "D"

ASSISTANT DISTRICT MANAGER, TELEPHONE COMPANY

Kinds of Decisions

Sales promotion expenditures.

Hiring decisions and separation decisions

Training decisions

Collection decisions (account collection)

How

Consider tariff situation. If applicable, I base decision in part on this. This is my basic guide.

What - Account Collection

Consider - expenses, minimum loss, customer satisfaction, cost of Collection.

How

In collection case, I receive a report with recommendation as to whether to handle this as a collection or drop the matter. I consider the report itself, and I evaluate the reporters' ability by considering his past performance, judgement, experience. I survey the material in report, then draw my own conclusion. I would then agree or disagree based on facts at hand, giving benefit of the doubt for variable situations, i.e., if I feel that his judgement is decent, I will agree, since part of my job is to train my junior executives in making decisions.

I would request additional information, if I feel that I can't make a good decision based on the material in the report. You get a feeling about reports as to their completeness based on past experience.

I must often decide whether to accept my subordinate's recommendation not to collect or search for more information.

I am pressured to decide because subordinates need decision so that they may take action. I must help him meet his deadlines (a moral obligation on my part)

I check procedures and company policy.

I feel that I must accept the responsibility for my decisions.

EXECUTIVE "E"

OFFICE MANAGER - PERSONNEL DIRECTOR

(Distributors of Auto Parts and Supplies, Home Appliances, and Air Conditioning.)

Kinds of Decisions

Decisions with our independent union (arbitration and negotiation)

Expenditure decisions.

How

I consider possible outcomes of my decision (Conditional approach)

If I do this, then what will happen. I must justify my decisions.

I consider company policy and use this as a reference framework.

Consciously and unconsciously I consider as many alternatives as possible.

1. Consider policy
2. Research alternatives (discussion, reports, personal inspection, interviews)

EXAMPLE

Problem - to improve multilith procedure

Gather information from multilith dealers, printing, shop operators. I tested machine by having girls all operate for

two weeks on a trial basis. I checked cost of materials and processes with old set up and new machine. To buy new machine I had to eliminate one man from printing shop.

I derived five possible alternatives.

1. Buy new machine now.
2. Don't buy new machine now.
3. Keep old procedure temporarily, buy machine later.
4. Change print shop set up.
5. Fire manager of print shop.

I decided to postpone buying machine and approach manager of print shop who was just newly hired at time of this decision, in about six months, when he better understands job.

EXECUTIVE "F"

AFROTC COMMANDANT OF CADETS

Types of Decisions

1. Personnel
 - A. Recommendations for promotions
 - B. Efficiency reports
 - C. Manpower utilization
 - D. Disciplinary decisions
 - E. Elimination decisions (cadets).
2. Training decisions.

How

Efficiency Report (e.g.)

1. I maintain a behavior log.
2. I consult my staff concerning ratee.

3. I consult the Air Force Regulation governing this.

4. I consider alternatives in rating.

I consider possible outcomes of decision. I ask, how does this affect me, the individual, my organization. The easiest solution is not always the right one.

In one rating, higher headquarters sent it back thinking I had rated the man too high. Again, I was faced with a decision. Should I change my rating? Did I need more information and justification? Should I "beef-up" my supporting comments.

Consider, a cadet I just eliminated. Prior to deciding,

I ask myself -

1. Is he a good cadet? Yes.
2. Is he good officer potential. Yes, but he has low grades.
3. Will low grades affect his performance?
4. I gambled on this boy and gave him several chances, but he failed and I had to eliminate him.

There seems to be several things involved. A certainty or objectivity. I use staff studies. Staff opinions. "Two heads are better than one". I weigh past performance and experience of my researchers or staff members.

I feel that the more experience I get, the more likely I am to make a right decision. However, I know that there is a gambling or uncertainty element involved.

There is an optimal point in decision making, i.e., the right time to make a decision. This is determined often by deadlines, superiors, conscience, information received, alternatives in view.

Beyond this, you find a "point of diminishing returns, i.e., it doesn't pay to hold off on your decision.

If possible, I like to "sleep on my ideas" or reflect on them.

EXECUTIVE "G"

PARTNER AND GENERAL MANAGER - Manufacturer of Display Equipment for Supermarkets.

Kinds of Decisions

1. Personnel - training and acquiring managers and supervisors, Foreman, sales managers.
2. Purchasing
3. Buying

How

Examine the problem. Decide what you have to know. I do a lot of reading. Two papers per day (Daily Herald and Wall Street Journal). I skim and read about 60 magazines a month to keep currently apprised. I also read Dunn's Review, Fortune, Newsweek, Time. I read magazines concerning price review.

Decided to set up purchasing department, and take away minor purchasing from foreman.

I get particular information.

Problem - Industrial Engineering as it affects our industry, i.e., Motion and TimeStudy. I purchased several books. I am worried about the degree of efficiency of our employees. I want to get into incentives and profit study. I'm worried about employee motivation. I believe you must be positive in your decision making. You must sell people on your decision. I do NOT like committee decisions.

I evaluate my sources of information. I question myself everytime I make my decision. I try to reduce subjectivity. The more you expose yourself to information, the more objective you become, i.e. the more you remove uncertainty.

Problem

Company owned vs. Family owned corporation vs. Publicly owned corporation.

Partnership - Pros and cons

Tax advantages in buying equipment.

Close control. More secretive regarding inventory, net worth.

Worry about employee motivation.

Supervisors - limited continuity.

Unlimited liability.

Corporation - disadvantage. Always scrutinized by Treasury.

I weigh all pros and cons. The big question here is how to weigh all the pros and cons.

We have decided to become a family owned corporation, then later to become an employee owned corporation.

I evaluated all reasonable alternatives.

I ask also, "Is this a decision I must make within a day, a week, a month", etc. An executive cannot afford to postpone decisions, however, he should not rush his decisions. It becomes a matter of available time, and you should gather all the information you can within the time limit.

The successful executive is one who maximizes correct decisions over the long run. You must consider costs. You must delegate decisions. This per se, is a terrific decision.

You must really consider all possible alternatives in tool designing. We have made mistakes in the past by not considering alternatives.

EXECUTIVE "H"
VICE PRESIDENT FOR PERSONNEL
Utilities Company

Kinds of Decisions

Salary, placement at higher level, i.e., recommendations to high levels, (e.g. vice president's salaries.) Final salary decisions for middle management personnel.

Reorganization decisions. Final decisions, middle-management and below. Benefits for employees.

How I Make Decisions

1. Recommendations of my subordinates are highly considered from a technical standpoint. I sometimes alter their recommendations considering the management climate" higher up. I encourage them to give me their best technical recommendations.
2. Management Climate - the attitude of my superior and my appreciation of the problems facing him. My superior's personal outlook, the industry as a whole.

When I submit a proposal, it is in such a form that it will maximize the possibility of being approved.

When I have the final "say so", I consider past practice. If I'm making a decision where there is no precedent, I consider all data, what is best for the company, my superiors feelings as to how he would handle it.

I find I make wrong decisions when I become impetuous.

TIMING IS SIGNIFICANT

Many times I will gamble on a decision (which, if time permitted, I would like to check out with my superior, but for some reason, he can't be reached). There are times when a decision must be made.

EXECUTIVE "I"

VICE PRESIDENT

Industrial Electrical Works

Manage Electrical Contracting. Must work through competitive bidding (about 80%)

Kinds of Decision Areas

Public Relations essentially with customers

Employee Relations

Government asks us to bid a job.

1. Determine what kind of job it is.
2. Ask, "Can we handle this?" Too big, too small or O.K.?
3. What amount of competition is involved. As number of bidders increase, our interest decreases.
4. Weigh jobs according to amount of labor, materials, etc. i.e., each job is different.
5. Labor is your greatest, most risky variable.
6. Who are owners, architects, other contractors?
7. We have certain degree of faith in others based on past performance. Many people make mistakes by rushing into a decision too quickly, i.e., they fail to consider

all possible alternatives.

Postponing decisions is important. Timing is important. I have a standing order for my foremen, when someone demands something of them, I have them hold off, and stall.

It isn't just a question of delaying, but delaying to wait for the opportune time. More is to be gained by waiting and weighing consequences.

Error in decisions often result from:

1. Acting precipitously; or
2. Postponing too long.

These are the extremes of error.

You may test out an unknown person or company by the "trial-run" method. Try him out on a small job and see how he handles it.

I try to reduce alternatives to a minimum number of good alternatives. Consider the long range or short range approach.

The long-term approach is the best. Decisions based on short-term gains is usually not so good.

The Number 1 premise in decision-making is self-confidence in the field in which you are deciding. You must understand your own interests and the interests of other people. Ethics is important here. Work for the company's benefit and your customer's benefit. This is a method of establishing long-range confidence.

You must know your own capabilities.

Profit motive and profit increase is important.

Suggest profit making for game.

EXECUTIVE "J"
PERSONNEL DIRECTOR
Steel Company

Kinds of Work - Personnel director, part-owner, board of directors.
Since I am part owner, I am much more free in making decisions.

How

1. What best serves the interest of the company?
2. Facts alone are not enough in making decisions. You must have feelings in decision making.
3. You must evaluate your sources of information. People tend unconsciously to "color" their reports. The best way to overcome this is to ask several people to research the same problem, and use an "average" approach.
4. Fact finding is paramount in every situation.
5. You have a sense of uncertainty - regarding time, amount of information.
6. The executive's job is to make decisions.
7. You cannot delay decision making because of unwillingness to attack the problem.
8. Committee functions best as a fact-finding group. They do not operate well as policy makers.
9. There almost always are several approaches to a problem.
10. I would attempt to select the least number of reasonable alternatives, then make my decision.
11. "Two heads are better than one". This is the advantage of many people studying problems.

12. The decision maker should stay within his own field. He should not consider factors at other levels.
13. There is a concept of losing battles to win wars. This is hard for many decision makers. The capability of a person to yield or sacrifice is a big factor.

One of the first questions - should I be the one to make the decision or someone else make it?

. APPENDIX C

Staff Description Cards

HAROLD E.

Harold has been with the company for twelve years. He is 40 years old, married and has two children. He is a high school graduate. Prior to working for the Wonderful Widget Company, he was a door-to-door salesman for a well known brush company. Prior to that, he owned his own used-car lot, but due to poor management on his part, he lost the business. He is boastful, inclined to exaggerate, and tends to gloss over details in his work. He is patronly to his subordinates, and occasionally goes overboard in defending his subordinates.

RODGER W.

Rodger is forty years old, married, with no children. He has been with the company for twelve years. He has two years of college. He was a pre-medical student. Prior to being promoted to manager, Rodger worked as assistant manager in the production department for two years, and as a salesman for two years. He has difficulty in organizing his reports, and he must rely heavily on his subordinates for report accuracy. He works very well under pressure, and, more than once, has come through "in a pinch".

JOHN K.

John is married, 38 years old, and the father of three children. He holds a Bachelor of Science degree in Business Administration and a Master's degree in Economics. John is aggressive, alert, and very intelligent. He is an excellent organizer and planner. He has held the position of manager of a large chain store. Several companies have tried to persuade John to work for them, but he has turned down these offers. He is "research-minded", and has a knack for digging out information.

GEORGE C.

George has been with the company for nine years. He has been manager for two years. He is 36 years old, married, and has four children. He holds a Bachelor of Science degree in retailing and marketing. George is very popular with everyone in the company and is always "the life of the party". He is definitely not a "paper-work" or detail man. He relies heavily on his subordinates for reports. In the past, this has led to inaccuracies in reports to the president, and he has been called to account for this on several occasions. He has a knack for getting the most out of his subordinates, and morale always seems to be high in his department.

JAMES J.

Jim is a hard working member of the staff. He is known as a strict, but fair-minded individual, Jim drives himself and his subordinates, but always seems to get the job done. He is formal and stiff in his dealings with others, and he has difficulty working with other members of the staff. Consequently, others often resent his presence. He holds a Bachelor of Science degree in engineering. He is 41 years old, and has been a member of the company for 18 years. Six months ago he was promoted to manager. Jim is married and has two children, both of whom are in college.

WILLIAM W.

Bill is single; 40 years old; a high school graduate, and quite the "ladies man". He is not very well liked by his subordinates, or his fellow staff members. He has a tendency to undermine others, and fails occasionally to support his subordinates. Recently, his work has been mediocre. Routine reports from his department are often late. When confronted with this, he has a tendency to avoid the responsibility for this, and blames others.

RALPH H .

Ralph has been with the company for twenty-five years. He is 48 years old, and has two sons in college. He is a widower. Ralph came up through the ranks, and has held several jobs in each of the departments. For several years in a row, he was cited as outstanding salesman, while a member of the sales department. Ralph is a high school graduate. He is driving and extremely ambitious--always on his toes. Occasionally he exhibits a disregard for the feelings of others, and several members of the firm have complained about his "throat-cutting", "back-stabbing" activities.

LAWRENCE G.

Lawrence has been with the company for twenty years. He has been manager of his department for ten years. He holds a Bachelor of Arts degree in mathematics. Recently he has experienced marital difficulties. For the past few months, he has been very irritable, and tends to become upset over minor things. Morale in his department has been low. Several subordinates have submitted complaints concerning his abusiveness towards them. To date, his department appears to be functioning well, however, tardiness and absenteeism has increased in his department in the past week. He resents suggestions for improvement.

PAUL M.

Paul is married - no children. He is 37 years old, and prior to last year, his record indicated only an eighth grade education. This year he was awarded his high school diploma, and he has recently enrolled in night school in the local university. He has come up through the ranks. Paul is hard-working, eager to learn, and ambitious. In his zealousness, he gives the impression of coldness. He is the type of person who can always be counted on to turn out a good job, regardless of the nature of the task.

APPENDIX D

Staff Description Card Rating Form
and
Instructions

INSTRUCTIONS

You have just been given a rating sheet and nine cards, each of which contains a name and description of a fictitious individual. Please check to insure that the cards are correct. The names of the cards are:

JOHN K.

JAMES J.

GEORGE C.

RODGER W.

PAUL M.

RALPH H.

LAWRENCE G.

HAROLD H.

WILLIAM W.

Assume that one of the persons described and named on these cards will be assigned to your staff. On the rating sheet, name and rank these persons from one to nine inclusive.....one being most desirable, nine, the least desirable. You may use any staff position as a criterion for evaluation, but be sure to consider all persons for this one job.

If there are any questions, please let me know.

PLEASE DO NOT CONSULT ONE ANOTHER REGARDING THE RATINGS

APPENDIX E

Summary of Ratings by 28 Executives
of
Staff Description Cards

R A T E R	S T A F F								
	John K.	James J.	George C.	Rodger W.	Paul M.	Ralph H.	Lawrence G.	Harold H.	William W.
1	1	2	3	4	5	6	7	8	9
2	1	4	6	5	2	9	3	7	8
3	1	2	4	5	7	3	6	8	9
4	2	4	9	1	6	3	7	5	8
5	1	2	7	5	4	3	6	8	9
6	1	7	5	4	2	3	8	6	9
7	1	4	5	3	2	6	7	8	9
8	1	5	7	4	2	3	6	9	8
9	4	6	1	2	5	3	9	8	7
10	1	7	5	3	4	2	8	6	9
11	2	1	5	4	3	7	6	9	8
12	1	5	3	2	7	6	4	8	9
13	1	3	2	4	7	5	9	6	8
14	1	3	2	6	5	4	8	7	9
15	1	4	7	5	3	2	6	8	9
16	1	3	7	5	2	4	6	8	9
17	1	7	2	6	5	3	8	4	9
18	1	2	5	4	6	3	7	9	8
19	1	3	7	5	2	4	6	9	8
20	1	3	4	5	2	6	7	8	9
21	2	5	1	6	3	4	7	8	9
22	1	4	5	3	2	6	8	7	9
23	1	7	2	6	5	3	4	9	8
24	1	5	7	6	1	2	2	8	8
25	1	2	4	7	3	5	6	8	9
26	1	2	7	5	3	4	6	8	9
27	1	4	6	5	3	2	7	9	8
28	1	2	4	5	3	6	7	8	9

APPENDIX F

Information Cards

1

95

The Jones Specialty Company discontinued ordering our product because delivery was promised by a certain date, but the order arrived several days late. This is a large loss, as Jones was our largest wholesaler.

2

Several customers have been handling a competitive product similar to "Widget". It is called the "Snarky", it sells at about the same price as the "Widget" and appears to be of similar quality. Being comparatively new, it does not enjoy the prestige of the "Widget".

3

A customer complained that the salesman is unable to answer questions concerning the product. The customer indicated to the salesman that he would like to have information concerning all the colors available. The salesman informed the customer that he didn't have such information, but that he would try to get the information as soon as possible.

4

Information from customers has been received in the past six months praising the idea of the colored enamel coatings of the "Widget". Eight months ago, when we replaced chrome with colored enamel coatings, we did so with the idea in mind that color would be an "eye-catcher".

5

Although we have used the hardest, harmless colored enamels developed in the industry, the company has received complaints from the home consumer stating that often times the enamel chips off the "Widget", making it less attractive. Also, particles of enamel get into the food during preparation.

6

Wholesalers and retailers have voiced many opinions about the difficulties of keeping the cardboard instructions that go with the "Widget" taped down to the product. Often the product becomes detached from the instruction sheet. The card contains instructions, and serves as an attractive, contrasting backing. It is secured with "scotch-tape".

7

The Jones Specialty Company handled our product for many years and was one of our largest wholesale customers. Jones is alleged to be in financial difficulty and is attempting to liquidate. They have discontinued the purchasing of our product.

8

Perry Brothers, Inc., one of our largest wholesalers, has complained twice in the past six months about receiving shipments of "Widgets" with the attached cardboard instruction sheet damaged. They claim that this gives the product a used look and makes it difficult to sell.

9

A survey of our wholesale customers reveals that orders have been received in sufficient time in most cases. With the exception of the Jones Company, the customers interviewed expressed satisfaction with delivery date and condition of merchandise.

10

Our main competitor, The Snarky Company, has recently entered into an intensive advertising program. They are selling both a deluxe chrome model and enameled regular models.

1

98

Production costs have increased 4% in the past year in the manufacturing of the "Widget". The wholesale and retail prices of the "Widget" have remained the same.

2

The Production Department is one man short in inspection and one man short in shipping, however, deadlines have been met.

3

The inspectors complain that lighting is not adequate to detect flaws in the "Widget". About one month ago, the president toured the Production Department. Lighting appeared adequate and no complaints were made when he asked about lighting conditions.

4

Last month inspection rejected 200 "Widgets" out of 5000 produced for the month. This month there were 350 "Widgets" rejected out of 8500 produced for the month. Rejection percentages range between 3% and 4% per month.

5

The "Widget" is placed on its cardboard backing by hand, and secured in place with two strips of "scotch-tape". A good packager can turn out a maximum of 150 completed items in an hour, with an average rate of 120 items per hour for an eight hour day. The overall packaging average is 95 items per man hour for the section.

99

6

The Production Department has had the lowest man hour loss due to sickness, accidents and general absenteeism in the past year. Less complaints are received from the Production Department than from any other department.

7

Since the changeover from chrome-plating to baked enamel coating, the output of the fabricating section has increased about 30%. There has been no noticeable "backlogging" in packaging, inspection or shipping, since the changeover.

8

Some grumbling about heat from the enamel baking oven. A complaint came from two men who formerly worked with the chrome-plating baths. They claim that the oven throws so much heat that production rates suffer throughout the Production Department (All production facilities are in one building)

9

Approximately 40% of the Production Department employees are women. The women are concentrated in the packaging and shipping sections.

10

A suggestion has been received from an employee in the department concerning use of the chrome-plating equipment. He suggests that market research be initiated to determine demand for the chrome-plated model. He suggests that if demand still exists for the chrome-plated model, the company should use the old plating equipment and produce both chrome and enamel models.

1

101

Salesmen are not satisfied with their travel allowance. They complain that 8¢ per mile is not sufficient and that they end up paying money out of their own pockets for road expenses. They use their own automobiles. Other companies pay about the same rate.

2

Two salesmen have quit in the past month, giving no reason. These salesmen have been replaced by new salesmen, but it will take anywhere from three to six months to train them properly. New salesmen are trained by accompanying senior salesmen on the job. This period varies depending on how quickly the trainee learns the job.

3

One salesman was overheard commenting on the quality of the "Widget". He indicated in his comments that he had noticed that the quality of the finish of the "Widget" had deteriorated over the past two months. Two other salesmen who were present said they were having difficulty selling "Widgets" for the same reason.

4

You receive information to the effect that the salesmen's reports are not being completed on time, nor are they current and accurate. It is alleged that in reality sales are up from last month, but the monthly consolidated sales report doesn't reflect this due to the inaccuracy, lateness, and incompleteness of the salesmen's reports.

5

102

A recheck of the monthly consolidated sales report shows a discrepancy in total sales volume. It appears that this month's sales volume is about equal to last month's volume. (The Sales Manager was sick during this period and the senior salesman prepared the report.)

6

It is reported that salesmen are having difficulty maintaining orders with regular customers, let alone finding new customers. The report alleges that this is due to "sales resistance". A competitive company is producing an item similar to "Widget" but is selling the item at a slightly lower price. (Snarky Co.)

7

Salesmen have been promising delivery of shipments in advance of the usual delivery time to customers. There has been difficulty in the past with late deliveries and evidently this is an attempt to regain good will with customers. No attempt has been made to coordinate with the production department concerning scheduling of orders and production time required.

8

The "Widget" has been manufactured and distributed for the past ten years in mid-western states only. To cover a larger area, the company would have to expand its operations considerably. A competitive product, the "Snarky", is produced in New York and is being distributed in thirty five states. The Snarky Company has been in business for two years, and expanded into our area about six months ago.

9

The Sales Department is using a sales manual which was written during the Company's first year. Each salesman has a copy of this basic sales manual. He also receives revision sheets from time to time. (The sales manual contains information concerning the Company's sales policies and sales techniques, and illustrations of the "Widget".)

10

Our competitor, The Snarky Company, gives a reduction of 5% net to wholesalers ordering in quantities of 1000 items or more per order. Our company does not have such a plan. Our salesmen claim this is one of the reasons we are losing ground to the Snarky Company.

APPENDIX G

Bill of Materials for Construction
of Playing Board

ITEM	SIZE	AMOUNT	UNIT COST	TOTAL COST PER ITEM
CLEAR SPRAY LACQUER	14 oz. can	1 can	.79	.79
RED ENAMEL	4 oz. can	1 can	.35	.35
IVORY ENAMEL	8 oz. can	1 can	.60	.60
FINE FINISHING NAILS	small sack	1 sack	.10	.10
FINISHING BRADS	small sack	1 sack	.10	.10
SCRAP LUMBER	odd pieces	not figured	—	—
SCRAP MASONITE	19-1/2"x 15-1/2"x 1/4"	1 piece	—	—
BLOCK LETTERS	sheet	1 sheet	.85	.85
TOTAL COST OF MATERIALS				= \$2.79