1968

Use of computer simulation to examine the validity of Getzels' and Guba's model in terms of its ability to predict administrative behavior

Gordon Lynn Gibbs
Iowa State University

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GIBBS, Gordon Lynn, 1942-
USE OF COMPUTER SIMULATION TO EXAMINE
THE VALIDITY OF GETZELS' AND GUBA'S MODEL
IN TERMS OF ITS ABILITY TO PREDICT ADMINIS-
TRATIVE BEHAVIOR.

Iowa State University, Ph.D., 1968
Education, administration

University Microfilms, Inc., Ann Arbor, Michigan
USE OF COMPUTER SIMULATION TO EXAMINE THE VALIDITY OF
GETZELS' AND GUBA'S MODEL IN TERMS OF
ITS ABILITY TO PREDICT ADMINISTRATIVE BEHAVIOR

by

Gordon Lynn Gibbs

A Dissertation Submitted to the
Graduate Faculty in Partial Fulfillment of
The Requirements for the Degree of
DOCTOR OF PHILOSOPHY

Major Subject: Educational Administration

Approved:
Signature was redacted for privacy.

In Charge of Major Work
Signature was redacted for privacy.

Head of Major Department
Signature was redacted for privacy.

Dean of Graduate College

Iowa State University
Ames, Iowa

1968
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I. INTRODUCTION

Throughout its development, administration, particularly educational administration, has been characterized by "periods of administration." Each of these periods has possessed some attribute - such as a particular philosophy of administration or a unique approach to administration - which has served to distinguish it from the other periods of administration.

Beginning at the start of the twentieth century, three periods in the development of educational administration have commonly been identified. The first of these periods, lasting from approximately 1910 to 1930, was characterized by the adoption, by educational administrators, of the principles of scientific management. These principles were the major theoretical constructs of industrial management during this period of time. This technique of adapting the theories of industrial management to use in educational administration was described by Campbell, Corbally, and Ramseyer (18, p. 70) in the following manner:

More than anything else, these early students of educational administration approached the field from the standpoint of job analysis. They observed administrators at work, noted the tasks they were required to perform, and then suggested how these tasks might be performed more effectively. Consciously or unconsciously, perhaps both, this attitude was a reflection of the work Taylor was doing in scientific management.

This first period of administration, characterized by its emphasis on the theoretical constructs of scientific management, preceded a second period of administration which began in the early 1930's and lasted until shortly after World War II. This period was characterized by the emphasis placed on the human relations and democratic aspects of administration.
Democratic administration, a phrase commonly used to describe the administrative processes during this period, quickly gained popularity and wide acceptance. A measure of the degree to which this particular philosophy of administration permeated the field can be gained by a superficial perusal of the literature of the period. Few textbooks in administration were written during this period which did not contain some reference to the term "democratic" in their title. A plethora of articles expounding the virtues of democratic administration characterized the periodical literature of the times. However, in spite of its rapid rise to popularity, democratic administration was not flawless and gradually lost its impetus toward the end of the 1940's. One flaw was described in the following manner by Campbell, Corbally, and Ramseyer (18, p. 73):

Democratic administration had many exponents, but for the most part they dealt in hortatory expositions and did little to give greater insight into the realities of school organizations and their operation.

Following the decline of democratic administration in the late 1940's, the emphasis swung to the theoretical development of administration. This emphasis on the theoretical aspects of administration has characterized the third period of administration, in which administration in general and educational administration in particular are currently engaged.

Most of the authors who have written in the field of administrative theory in education, including Halpin (44) and Griffiths (40), have identified three major events which have had a major influence on the recent emphasis on the development of administrative theory in education. These three events were: (1) the establishment of the National Conference
for Professors of Educational Administration (NCPEA) in 1947, (2) the Kellogg Foundation's support of the Cooperative Program in Educational Administration (CPEA) begun in 1950, and (3) the establishment of the University Council for Educational Administration (UCEA) in 1956.

As a result of the stimulus provided by such organizations, many of those persons concerned with administrative theory initiated various research projects in their attempts to construct a comprehensive or global theory of administration; a theory which would serve to describe equally well the administrative processes involved in any area of administration. One such research project was carried out under the sponsorship of the Kellogg Foundation. The project was conducted by Jacob W. Getzels at the Midwest Administration Center at the University of Chicago. The resultant theoretical development has been described by Griffiths (40, p. 54):

Administration is conceived of structurally as the hierarchy of subordinate-superordinate relationships within a social system; . . . The social system is comprised of two dimensions: the nomothetic which consists of institution, role, and expectation; and the idiographic which consists of the individual, his personality, and his need dispositions.

Getzels, in collaboration with Ebon G. Guba, later constructed a second theory of administrative behavior which was a modification of Getzels' original theory. It was this modified version which was selected as the basis for this study.

A. Statement of the Problem

This study was concerned with the examination of the validity of the model of administrative behavior developed by Jacob W. Getzels and Ebon
G. Guba, in terms of its ability to predict administrative behavior in an educational environment. More specifically, the problems of the study were:

1. To develop a FORTRAN program for an IBM System 360/Model 65 digital computer which could be used to simulate the dynamic aspects of the model as developed by Getzels and Guba, and as further articulated by the researcher.

2. To collect and/or record pertinent data on the personalities and need dispositions of educational administrators reacting to hypothetical administrative problems in a controlled situation.

3. To use the collected data as input for the computer program in an attempt to predict each subject's decision on each of ten hypothetical administrative problems.

4. To compare each subject's decisions with those predicted by the computer in order to obtain an index of the validity of the model of administrative behavior developed by Getzels and Guba.

The subjects used in the study were graduate students enrolled in graduate level courses in educational administration at Iowa State University, Ames, Iowa, during the Spring quarter of the 1967-1968 academic year.

B. Purpose of the Study

The purposes or objectives of the study were:

1. To attempt to ascertain whether or not the model of administrative behavior developed by Getzels and Guba is capable of being
operationalized to the extent that it could be programmed for computer simulation.

2. To attempt to ascertain whether or not the model of administrative behavior developed by Getzels and Guba was valid in terms of its ability to predict administrative decision-making behavior.

3. To provide information which might be used in identifying types of administrative behavior which in turn might be of value in future theoretical development.

4. To identify some of the personality characteristics and need-dispositions of educational administrators which affect their decision-making behavior in specific decision-making situations.

5. To supply information which might serve as background material for future studies.

C. Need

Even though digital computers are a relatively recent development, and their application to problems in the behavioral sciences is even more recent, numerous studies in which computers have been employed as simulation devices have been reported in the review of literature. The majority of these studies, however, have been conducted in the field of industrial management, and most have been concerned with the use of the computer as a means of processing and producing information; i.e., the computer has been used as a device which simply supplies information to a subject who then uses this information and resultant feed-back, in terms of computer output, to perform the necessary actions and make the necessary decisions
that he would be required to perform and make in a real management situation.

A few studies have been reported which deal with the use of computers to simulate behavior, but most of these have been concerned with the behavior or decisions of a group rather than of an individual. Of those studies concerned with the prediction of individual behavior and/or decision-making, there was no evidence of any recent studies which were specifically concerned with the use of a computer to predict decision-making behavior in educational administration, or whose purpose was to examine the predictive validity of the model of administrative behavior developed by Getzels and Guba.

The results of the present study should prove to be valuable not only to those persons engaged in the theoretical development of educational administration (for it investigates one possible method of examining the predictive validity of the products of such development), but also to those persons interested in the determinants of administrative behavior, especially administrative behavior carried out in an educational environment.

Theoretical development, in and of itself, is a meaningless endeavor if the development ceases once a theory has been formulated. Griffiths' comments relative to this point are worthy of note. He stated (40, p.69):

The ultimate value of any theory is its fruitfulness in the production of testable hypotheses. Many of the theories have produced no testable hypotheses -- in fact, their very form precludes this possibility.

Therefore, theoretical development must proceed beyond the point of formulation to the point of stating testable hypotheses which are the result of
logical deduction from the theoretical constructs. A theory is not meaningful if it remains as a collection of words and symbols. Even if it has yielded a set of testable hypotheses, these hypotheses must be tested. For, only by actually testing the hypotheses can the validity of the theory be examined. If the theory is not valid in its ability to accurately describe the relationships which exist among the variables, and if the theory goes unchallenged, then conclusions based on deduction from the theory may be grossly incorrect and result in a complete misunderstanding of the phenomenon under consideration. For example, just as the theory that the Earth was the center of the solar system and that the other heavenly bodies revolved around it led ancient scholars to develop inaccurate conclusions concerning various natural phenomena, so does any theory which is not valid, but which is accepted, impede progress toward the correct understanding of the phenomenon under consideration. Therefore, establishing the validity of a theory is an integral aspect of theoretical development. To examine the validity of the model of administrative behavior developed by Getzels and Guba was one of the purposes of this study.

In the process of theoretical development, the requirement that one must establish the validity of a theory poses another problem. The problem is that involved in testing the hypotheses while carrying out the purely mechanical tasks necessary to validate the theory. In the physical sciences it is a relatively straightforward task to test the hypotheses; i.e., to establish the validity of the theory. In the social sciences on the other hand, it is neither easy nor straightforward. In the social
sciences, and particularly in the behavioral sciences, two major obstacles have hindered the testing of hypotheses derived from theoretical formulation.

The first of these obstacles has been the identification and control of the variables which serve as the constructs of a theory. To identify all of the variables is a monumental task. Even assuming that all of the variables have been identified, the task of controlling all of them presents an almost insurmountable obstacle.

The second obstacle to the testing of hypotheses in the behavioral sciences has been the extremely complex nature of the subject itself; the complex nature of human behavior. The primary reasons for this have been that the variables involved in human behavior are so diverse and do not readily yield to experimental control. Also, because of the number and complexity of the variables, it has been a monumental task to use hypotheses which employ such variables as constructs, as predictive devices. The element of time itself has been a prohibiting factor. However, with the advent and development of digital computers, the factors of complexity, number, and time are no longer major obstacles to the testing of hypotheses in the behavioral sciences.

Due to the tremendous speed and "memory" capacity of digital computers, it has been made possible to use an hypothesis to predict specific kinds of behavior, and to then observe actual behavior in order to make a comparison between the predicted and the observed behavior. If the theory is valid, if the hypothesis has been logically deduced from the theory, and if the operationalization of the hypothesis for computer
simulation has been based on sound logic, operational definitions, and accepted programming techniques, there should be a high positive correlation between the predicted behavior and the observed behavior.

The need for testing hypotheses derived from theories of administrative behavior is unquestionable. Griffiths spoke very strongly to this point when he said (40, p. 69):

The question is whether we are at a point in theory development where maximum fruitfulness is being realized from our theoretical efforts. The answer appears to be "no".

As one reads and works with present theories of administration, it is apparent that there is a need for greater precision in theory construction. This can be accomplished by more operational definitions, by more logical constructions, and by stating relationships in mathematical formulations.

This study was designed to move in the direction recommended by Griffiths.

D. Terminology

A computer model was defined as a computer program designed to manipulate the terms of a model according to the rules of the model.

A computer program was defined as the set of FORTRAN instructions which enable the computer to carry out the desired manipulations of the data.

A decision was defined as the selection of one of several alternatives which had been provided as possible solutions to a hypothetical problem.

An expectation was defined as the pattern of normative behavior established by an institution for an incumbent acting in a role of the
An institution was defined as an organization possessing a specific goal or goals, with existing structure and roles and goal expectations.

A model was defined as a description of a set of behavior in terms of a system of symbols, and the manipulation of the symbols according to the rules of the system.

A need-disposition was defined as an individual tendency to orient and act with respect to objects in a certain manner and to expect certain consequences from these actions.

Personality was defined as the dynamic organization within the individual of those need-dispositions that govern his unique reactions to the environment.

A personality need was defined as a subject's score on any one of the fifteen classifications on the Edwards Personal Preference Schedule.

A role was defined as the dynamic aspects of the positions, offices, and statuses within an institution which define the behavior of the incumbents or actors.

Simulation was defined as the dynamic representation achieved by building a model and moving it through time.

A system was defined as a set of activity elements which are interdependent with respect to their functioning and operate as a boundary-maintaining unit.

A theory was defined as an interrelated system of constructs at least some of which can be operationally defined.
E. Sources of Data

Data for this study were obtained from the following sources:


(2) The subjects' decisions on each of ten hypothetical problems constructed by the researcher with the assistance of staff members in the Department of Education and the Department of Psychology at Iowa State University, Ames, Iowa.

(3) From the printout of a computer program, written by the researcher, and executed on an IBM System 360/Model 65 digital computer.

F. Outline of Subsequent Chapters

This chapter of introduction is followed by six chapters. Chapter II, entitled "Review of Literature", includes a review of the literary materials which were used to provide background and other information pertaining to this study. Chapter III, entitled "Methods of Procedure", explains the procedures followed in obtaining the findings of this study. Chapter IV, entitled "Development of the Computer Model", explains how the computer program was developed. Chapter V, entitled "Findings", presents the information derived from this study concerning the predictive validity of the model of administrative behavior developed by Getzels and Guba. Chapter VI, entitled "Discussion", contains the discussion of the findings. Chapter VII, entitled "Summary, Conclusions, and Recommendations", is the concluding chapter of this study.
II. REVIEW OF LITERATURE

A. Administrative Theory in Education

1. **Historical perspective**

   Administrative theory, especially administrative theory in the field of educational administration, has been a relatively recent approach to the study of administration. Speaking about public school administration, Knezevich stated (55, p. 4):

   "Public-school administration is a relatively new field and is distinctly American in flavor. When compared with formal study and research in general governmental, industrial, or business management, school administration can be said to be in a stage of early development, if not adolescence.

   If educational administration can be said to be in a stage of "adolescence", then administrative theory in education can be said to be in a stage of "infancy", for its development comprises only a subset of time with respect to the development of administration. Griffiths described the emergence of interest in administrative theory in the following fashion (40, pp. 2-3):

   "Interest in theory . . . is relatively recent in educational administration . . . Since 1946 there have been several events which have been the building blocks upon which the present interest in theory is based. These events have ranged from the writings of a single individual to the formation of a national organization.

   Thus, it has only been for approximately two decades that administrative theory has occupied a position of genuine interest in the field of educational administration."
2. Early developments in administrative theory

Even though interest in administrative theory probably originated in the years immediately following World War II, related work had been done earlier.

During the 1920's and the 1930's the contributions of such men as Frederick Taylor and John Gilbreth in the field of scientific management provided industry with more efficient methods of operation, but their work by no means constituted a theory of administration. Perhaps the first contribution that could be considered as truly belonging to the realm of theoretical development was that of Chester I. Barnard in the late 1930's. In his book (14), *The Function of the Executive*, Barnard enumerated and discussed in detail those functions which he felt were common to executives in all fields. His observations were based on his many years of experience as an executive in large industry. His work went largely unnoticed in the years immediately following the publication of his book, and it was not until the emergence of interest in administrative theory in the late 1940's that his work was recognized as a major contribution.

The work of Barnard provided a foundation upon which the structure of administrative theory could be built, but his list of executive functions was not a theory of administration. Rather, it was a taxonomy, a classification of the functions, and the two words "theory" and "taxonomy" are not synonymous. True theoretical development in educational administration, theoretical development embodied in the search for a global or comprehensive theory of administration, did not begin in earnest until the late 1940's. The year 1946 has been identified by Griffiths as the
year from which progress in the theoretical development of administration should be measured. He stated (40, p. 5):

Beginning in 1946, the W. K. Kellogg [sic] Foundation of Battle Creek, Michigan, became vitally concerned with the administration of public schools. . . . In large measure the present urgency concerning theory can be traced to the stimulus given by the Kellogg [sic] Foundation.

In addition to the stimulus provided by the Kellogg Foundation support of the Cooperative Program in Educational Administration (CPEA), Halpin (44) has identified two other influences on theoretical development in educational administration. The first of these was the establishment of the National Council for Professors of Educational Administration (NCPEA) in 1947, and the second influence was that of the University Council for Educational Administration (UCEA), established in 1956. Speaking of the influence of the NCPEA, Halpin stated (44, p. 3):

This group, through its annual meetings and other activities, has facilitated communication among those who train administrators and has fostered higher and higher standards of training.

Griffiths was more explicit when he made the following statement (40, p. 3):

These men did two things: first they challenged the type of thinking which had been prevalent in educational administration, and, second, they offered many suggestions for new approaches to thinking in the field.

With organizations such as the CPEA, the NCPEA, and the UCEA providing the stimulus, and the work of men such as Barnard, Taylor, Gilbreth, Gulick, and others providing the background, the theoretical development of educational administration gained momentum in the early 1950's and has continued to progress. An examination and/or review of
specific aspects of this development is the next focus of consideration.

3. Theoretical development of administration

The most logical first step in the theoretical development of administra­tion was the construction of a system of classification, a taxonomy, of the administrative functions. The work of Barnard (14) has already been cited as an example of such a development. His, however, was a taxonomy of specific functions. Other authors have been concerned with a taxonomy of terms and concepts.

A typical example of such a system of classification was that of Paul R. Mort and Donald H. Ross (60). Mort and Ross listed fourteen principles which they had first grouped into three categories. The three categories and the subsumed principles were (60, pp. 27-28):

The humanitarian group (the public sense of the right in relationships between persons)
1. structural democracy
2. operational democracy
3. justice as a guide to administration
4. equality of opportunity as a guide to administration

The prudential group (the public sense of the practical)
5. economy
6. checks and balances
7. liberty and license
8. responsibility and authority
9. simplicity
10. loyalties
11. inertia

The tempo group (the impacts of constant and changing values, needs, and insight)
12. adaptability
13. flexibility
14. stability

That these principles were contradictory and not all equally applicable in a given situation was acknowledged by Mort and Ross. In an attempt
to resolve this dilemma, they proposed that each situation be approached "as an opportunity to exercise resourcefulness in finding applications of these various principles" (60, p. 249). This approach was what they termed "balanced judgment".

Using classification systems such as the ones described in the preceding paragraphs, other persons interested in the theoretical development of educational administration embarked on the task of constructing a comprehensive and consistent theory of administration; a theory which could not only describe administrative behavior, but also produce testable hypotheses which would in turn lead to a more complete understanding of such behavior.

The approaches employed by such "theorists" were almost as numerous and diverse in character as the theorists themselves. However, in order to make their consideration and review in this study more cohesive, and in order to impose some sense of continuity on the discussion, these approaches have been grouped into the following categories: (1) sociological approaches, and (2) psychological approaches. These categories are not mutually exclusive, and in many cases it may be difficult to distinguish between a sociological and psychological approach. In such instances, the decision to include a particular piece of research in one category rather than the other was an arbitrary one. The purpose of the categorization of the approaches was to facilitate their presentation and was not to impose an exact distinction on the approaches.

In an attempt to formulate, for the study of educational administration, a framework which would provide a base for systematic research and
which would indicate, within broad limits, the nature of the research that might properly be derived from such a framework, Jacob W. Getzels (35) considered administration from the standpoint of administrative relationships. Getzels considered a dyad - a relationship between a pair of individuals in which one individual is termed the initiator and the other is termed the recipient - as the basic administrative relationship. Within such a dyad, Getzels identified as crucial the following three dimensions of the relationship: (1) authority, (2) scope of roles, and (3) affectivity.

Authority was viewed as being either traditional, charismatic, or rational, with administrative behavior classified as rational. The scope of the roles was considered as either functionally diffuse or functionally specific, and the role of the educational administrator was placed in the latter category. Affectivity was divided into two categories - universalism and particularism - with educational administration considered as an element of universalism.

Based on this dyadic relationship, Getzels made the following conclusions (35, pp. 241, 242, 245):

Empirical data are needed to clarify the relationships between the authority, role, and personal dimensions of administration in the educational setting.

We would hold it as axiomatic that universalism varies inversely and particularism directly with the distance between the statuses and the frequency of the face-to-face contacts between the administrator and the administered.

... when roles and facilities subject to administrative allocation and integration transgress in number and kind those required by such factors as professional preparation of teachers and the nature of the community,
conflicts in teacher and administrator roles ensue with consequent deterioration in the administrative process.

From these conclusions it appears that Getzels considered the dimension of role as occupying a position of paramount importance in the theoretical constructs of administration.

Conrad (23) also approached the theoretical development of educational administration from a sociological perspective. His concern, however, was the identification of socially adaptive tasks which arise in educational administration. The three major adaptive tasks identified by Conrad were: (1) recognizing and responding to the standards, group structures, backgrounds, and occupations of the many organized and non-organized groups within and outside the school, (2) becoming aware of group conflicts, and (3) maintaining the uneasy balance of organizational necessities and the human aspirations of organization members.

Numerous studies which have approached administrative theory from a sociological perspective have been primarily concerned with either leadership or group dynamics. Halpin (45) conducted a study whose purpose was to determine whether two groups, educational administrators and aircraft commanders, differed significantly in their leadership ideology and leadership style. The study was confined to two dimensions of leader behavior - initiating structure and consideration. Halpin found that variance in leader behavior was significantly associated with situational variance. According to Halpin (45, p. 28):

The administrators tend to show more Consideration and less Initiation of Structure than the commanders. These differences are presumably associated with differences between the institutional settings within which the two groups of leaders operate.
In a study concerned with administrative roles and behavior, Guba and Chase (41) first defined what they considered to be the significant variables. Included among such definition were the following: **role** - the set of behaviors made incumbent on the holder of a given position or status within an organization; **role expectations** - the particular behavioral prescriptions defining a role; **personality** - the set of need-dispositions brought to the role by a particular actor; and **behavior** - the patterns of action actually followed by an actor, which in general represents a fusion of situational role expectations and individual need-dispositions. Guba and Chase found that satisfaction was related to:

1. opportunity to participate regularly and actively in educational planning,
2. fulfillment of role expectations,
3. ability to predict action of superiors,
4. group unity,
5. personal interest of superiors.

The variables relating to effectiveness and productivity did not seem to be so well defined as were those dealing with satisfaction and morale. The major variable identified seemed to be that of leadership style. Guba and Chase stated (41, p. 288):

> . . . the successful educational leader is a democratic individual who tends to fit rather well the descriptions that psychologists give of the "self-actualizing" person.

Finally, Guba and Chase examined the concept of role conflict. According to the authors, role conflict occurred in a situation in which a role incumbent was required to fulfill simultaneously two or more sets of expectations that presented contradictory, inconsistent, or even mutually exclusive aspects. Thus (41, p. 29):
One of the primary concerns of principals and superintendents, therefore, should be to bring about harmony among expectations and between expectations and personnel.

In review, the one feature that such sociological approaches to administration has in common was that each was primarily concerned with one or several variables that were inherent in the position and were not brought to the position by the administrator. These variables included role, expectations, conflict, and group dynamics. In contrast, psychological approaches to administration have been concerned with the relationships between administrative behavior and such variables as personality, attitudes, intelligence, needs, etc.

Campbell and Faber (19) conducted an extensive review of research related to administrative behavior. Among those studies which were concerned specifically with psychological factors, they found the following (19, pp. 356, 358):

Presthus . . . attempted to build a general theory of organizational behavior based on the assumption that anxiety is the most critical variable involved. He held that the reduction of anxiety facilitates accommodation of the individual to the demands of the organization.

Vroom . . . found that the more positive a person's attitudes toward an organization, the greater the tendency for him to perceive a similarity between the organization's goals and his own. Accuracy of perception is influenced by (a) extent of agreement between personal and organizational goals and (b) attitude toward the organization.

Lipham (56) reported that on the Edwards Personal Preference Schedule administrators were high in needs for: (1) deference, (2) order, and (3) endurance; and low in needs for: (1) exhibition, (2) autonomy, and (3) heterosexuality. In addition, Lipham reported (56, p. 443):
Moreover, self-esteem of the subordinate was found to be a significant mediating variable; there was a marked increase in aggressiveness of subjects having low self-esteem.

Hines (52) attempted to find possible relationships between personality factors as represented by scores on the F Scale, the Guilford-Martin GAMIN, and responses to a principal's behavior checklist. He found no significant correlations between the various personality factors and the frequency of the classifications of behavior.

Thus, sociology and psychology have provided the basic framework for the theoretical development of administration. The research and theoretical formulations which have been supported by the structural framework must receive some consideration.

The following comment made by Hagman and Schwartz (43, p. 277) is no longer true. "There has been a growing interest in the development of basic theory in school system organization and administration, but little significant research." The literature is replete with research concerning administrative theory. It would be beyond the scope of this study to attempt to review any major portion of such research, but certain typical ones have been reviewed to provide some insight into the kind of work that has been done in this area.

Bessent (15) theorized that administrative behavior in institutions was the result of the dynamic interaction of: (1) the individual's attempt to fulfill expectations for his behavior according to the role he occupies in the institution, and (2) his need to act consistently with his own personality. In a study designed to examine the predictability of selected elementary school principals' behavior, Bessent obtained the
following measures on a selected sample of elementary principals: (1) The Cooperative English Test, (2) the Watson-Glaser Critical Thinking Appraisal, (3) the Miller Analogies Test, (4) the Guilford-Martin Inventory of Factors, (5) the Guilford-Martin Personnel Inventory, (6) the Minnesota Teacher Attitude Inventory, and (7) the Peer Acceptance Inventory. Bessent then compared the subjects' scores on these instruments to obtain descriptions of administrative behavior which were classified as either global or specific behavior. The obtained relationships showed that global factors were more predictable than were specific administrator behaviors, and that personality and sociometric measures were more effective predictors than were measures of mental or verbal ability.

The purpose of a study by Smith (76) was to analyze a comprehensive sociological theory as a potential tool for explaining and guiding research of administrative behavior in education. Specifically, this investigation of theoretical concepts identified the theory of action as developed by Parsons, Bales, and Shils as an appropriate theory for use in studying administrative behavior. It attempted to assess, in terms of its consistency with present knowledge of educational administration and in terms of recognized problems which need to be studied, its appropriateness and potential for stimulating testable hypotheses which could be used for studying and explaining administrative behavior in education.

It was concluded that the theory of action in its present state is an appropriate one for developing increased understanding and improved research activity relating to administrative behavior in education.
The studies cited have been only a few of the numerous studies in the area of the theoretical development of administration. Most were concerned with the development of theory. Only a few were concerned with the testing of these theories.

B. Predicting Human Behavior

Psychologists have been concerned with predicting human behavior ever since psychology became a separate discipline. Most of the research in this area, such as the study conducted by Vernier, Whiting, and Meltzer (79), has been concerned with the prediction of behavior patterns based on the results of various projective instruments, such as the Rorschach Test or the Thematic Aperception Test. Such projective techniques require a great deal of sophisticated training for their interpretation. Moreover, they were not intended to be used as predictors of specific behavior. For these reasons, such research studies have not been included in this review. Only studies concerned with predicting either general behavior, administrative behavior, or decision-making behavior have been included.

1. Predicting general human behavior

In an article published in the Journal of Personality, Dodd (28) presented his theory of behavior which he called the valuance submodel of the actance theory. To assist in the understanding of this theory, two terms were defined. The term "actance" was defined as the expected or hypothesized action or behavior. The term "valuance" was defined as a subcase of actance; in particular it was that subcase in which valuing or goal-seeking was the aspect of behavior which was the object of observation.
Dodd divided behavior, B, into the following six basic categories: (1) the object of value, V; (2) the desiring, D; (3) the population factor, P; (4) the time factor, T; (5) the space factor, L; and (6) the residual conditions, C. Behavior was then conceived of as a function of the six factors. Mathematically this function was represented by the equation:

\[ B = f(V, D, P, T, L, C). \]

Dodd explained the meaning and use of this equation in the following manner (28, p. 493):

... Each of the factors may be weighted by an exponent. ... In valunce theory the weighting exponents which have so far been found germane to the derivation and testing of the conditions are positive and negative integral exponents, zero to three ... These exponents serve as weights for factors in a product just as coefficients (such as multiple regression weights) serve as weights for addends in a sum. Negative exponents thus mean that their base factors divide the effect of, or counteract, the other factors which have positive exponents.

The equation would then take on a form:

\[ B = V^{x_1} D^{x_2} P^{x_3} T^{x_4} L^{x_5} C^{x_6}, \]

where \( x_1 = -3, -2, -1, 0, 1, 2, 3; \)
\( x_2 = -3, -2, \ldots, 3; \)
\( \vdots \)
\( x_6 = -3, -2, \ldots, 3. \)

The testing of this model involved three steps: (1) the inspection of a graph of the physical data and the model, (2) a closeness-of-fit index which measured the correlation between the physical data and the model, and (3) a test of statistical significance of the correlation.
 coefficient obtained in the second step. At the time of this study, the results of such tests were not available.

A second attempt at the development of a theory of behavior was carried out by P. G. Herbst (50). Herbst approached the problem from the concept of a system, which he defined as a set of activity elements which are interdependent with respect to their functioning and which operate as a boundary-maintaining unit. Following this definition of a general system, Herbst described a behavior system in the following manner (50, p. 71):

A behaviour [sic] system, in order to maintain itself in existence, has to obtain a certain range of "inputs" from the environment which are reciprocated by some form of output. This constitutes the "positive dependence cycle".

The formation and maintenance of a positive dependence cycle results in the simultaneous emergence of a negative dependence cycle. Events which interfere with the functioning of the positive dependence cycle constitute "stress", which may be regarded as a negative input that gives rise to a negative output in the form of "external adjustment processes" directed to induce change in what the system reacts to as the stress-inducing agent.

In light of the preceding statements, an activity was viewed as a transformation process involving an initial state of events which had been subjected to an operation resulting in a different state of events. If a set of such activities was linked together, then the resulting structure was a "transformation network". According to Herbst, a behavior system may thus be viewed as a boundary-maintaining unit within a transformation network.

Herbst found that the three major factors which influenced the action level of the system were: (1) the size of the system itself, (2) the
activity rate within the system, and (3) the level of integration among
the activity elements of the system.

2. Predicting decision-making behavior

A great deal of research which has been done in the area of predict­
ing human behavior has been specifically concerned with decision-making
behavior. Many authors have used the phrases "decision-making behavior"
and "administrative behavior" synonymously. If the two are not synon­nomous,
then at least decision-making behavior is a major part of administrative
behavior. As such it is deserving of careful consideration. Counts (25)
stated (25, p. 10):

If the quality of decision-making in education is to be
improved, the resources of the social and human sciences
will have to be incorporated into the process.

The following research studies represent numerous efforts to bring such
resources to bear on the question of decision making.

Robert Calkins (17) identified the following methods of decision
making: (1) intuitive, (2) reliance on custom, tradition, or rule of
thumb, (3) authority, (4) reliance on precept or maxim, (5) reference to
general principles, and (6) rational analysis. Relating these methods to
decision making in education, Calkins believed the methods most often used
were authority, rational analysis, and reliance on tradition.

In a similar approach, Newsome and Gentry (63) identified five
specific kinds of educational decisions. These were: (1) routine de­
cisions based on personal habit and custom, (2) legalistic decisions based
on an appeal to and an interpretation of laws, policies, and precedents,
(3) rational decisions based on conclusions that logically follow from premises or evidence in either inductive or deductive argument, (4) decisions that result from consensus or common agreements, and (5) persuasive decisions, decisions that must be sold to a majority to be accepted and implemented.

In an experimental study, Waldrip (80) sought to compare the decisions made in three processes - real-group processes, discussion-group processes, and nominal processes. As subjects, the study used students in a graduate class in educational administration. Three randomly assigned groups of eight members each composed the experimental population. Waldrip found that the nominal procedure was the most rational approach to the decision-making process.

In a study conducted by Sieber and Lanzetta (74), predecisional information processing was studied in relation to a model based on theories of conceptual structure and arousal. The purpose of the investigation was to test the hypothesis that the complexity of decision processes is a function of problem uncertainty, problem importance, and the conceptual structure of the decision maker.

As criteria of the complexity of predecision strategies, Sieber and Lanzetta used the following quantitative measures: (1) amount of predecision information search, (2) frequency of expressed doubt or acknowledgement of alternative modes of solution, (3) tentativeness of the solution given, (4) amount of new information generated in the process of making a decision, and (5) the amount of time spent in processing newly acquired information.
The investigators used 30 college undergraduates as subjects. On an independent measure of conceptual structure, 15 of these subjects had obtained highly abstract scores and the remaining 15 had obtained highly concrete scores. After viewing each of several tachistoscopically exposed slides as frequently as desired, each subject was asked to identify the slide.

Except for time taken to process new information, which did not vary as a function of conceptual structure, every independent measure supported the hypothesis. A general increase in complexity of decision processes with increases in problem uncertainty exhibited by all subjects was more predominant for persons who had obtained a highly concrete score than for persons who had obtained a highly abstract score.

Lundberg (57) presented a scheme for the analysis of administrative decisions. He classified research on decision-making into three categories. The first category was the intuitive approach, and included research which was a distillation of the experience of practitioners of one sort or another. The second category was the normative approach. This classification included research in which a rational model based on statistical or mathematical premises was either constructed or tested. The third and final category was the research approach, which included investigations of an inductive nature.

Related to each of these categories, Lundberg made the following statement (57, p. 19):

Many of these theories . . . are modifications of one sort or another of a theory which assumes a completely rational man, confronted with a pair of alternatives, who selects the alternative which yields the greater profit or
satisfaction. Such a theory assumes little about, and in fact, ignores, the psychological characteristics of men or the social environment in which they find themselves.

In effect, what Lundberg said was that any theory of decision-making which is based solely on rational choice neglects two important factors - the psychological characteristics of men and their social environment - and that the omission of these factors renders the theory inoperable in any practical sense.

The purpose of a project conducted by Herbert A. Simon was to construct definitions of "rational choice", definitions which were modeled more closely upon the actual decision processes in the behavior of organisms than previously proposed definitions. Simon suggested that definitions of this type might have normative as well as descriptive value. In particular, he stated that (75, p. 124), "They may suggest approaches to rational choice in areas that appear to be far beyond the capacities of existing or prospective computing equipment."

The fact that contemporary economic theory and administrative theory have attempted to deal with human behavior as intendedly rational behavior was viewed as paradoxical by Simon, for it was his opinion that it could be demonstrated that if global kinds of rationality were assumed then problems of internal structure largely disappear. In other words, if the behavior is completely rational, it is completely predictable, and the problems envisioned by economic and administrative theory could not arise. If, on the other hand, the organism is viewed as of limited knowledge and ability, and if it is assumed that because of these limitations the organism would not behave in a completely rational manner, then the
paradox vanishes and the outlines of theory begin to emerge. In order to make a choice, the organism must simplify the real world, and such simplification would introduce discrepancies between the simplified model and reality. Such discrepancies, according to Simon, could explain many of the phenomena of organizational behavior.

The cooperative resolution of a dyadic conflict was studied by Atthowe (13) as a special case of decision making. Fourteen dyads (pairs) of male subjects were used, and each dyad contained at least one member whose choices on an independent instrument were judged as nonrational. Two additional dyads, each consisting of two completely rational subjects, were tested as a control measure. In each dyad, the subjects were required to make a joint decision. Atthowe found that the efficiency of the decision was related to the type of choice situation, the magnitude of the difference between the members of a dyad, and the nature and amount of interpersonal influence. He also found that the dyadic resolution of a decision conflict was conservative in strategy.

The findings of Simon (75) and Atthowe (13) were supported by Hill (51). He attempted to establish a rigorous framework to isolate and measure the nonrational variables involved in the decision-making process. His findings indicated that a rational model for decision making was not followed by the subjects. Nonrational factors, such as personality, were found to have a more significant effect on the decision-making process than were rational factors, such as intelligence.

Though the research presented in this section did not contain any uniformity of opinion as to what approach to the investigation of decision
making was most profitable, all agreed that decision making was not a completely rational process, but that other nonrational factors affected the decision-making process.

C. Simulation

The term "simulation" has been defined as the dynamic representation achieved by building a model and moving it through time. Various vehicles - including in-basket/out-basket materials, role playing, and computers - have been used to achieve this dynamic representation. For the present purposes, only research involving computer simulation has been included in the review.

Much use of computer simulation has been made by industry. The complexity of many industrial organizations has made the computer a welcome ally in management training as well as in practice. Only recently, however, have other disciplines - such as education, psychology, and sociology - recognized the value and contributions that computer simulation can make to their respective fields.

Speaking of computer simulation of human behavior, E. A. Feigenbaum made the following statement (32, pp. 1-2):

A digital computer is a general information processing system, a general symbol manipulation device . . . . It is capable of carrying out any well-defined, precisely stated process for the manipulation of information.

Newell and Simon described the impact that computer simulation has had on the study of problem-solving behavior as follows (62, p. 277):

The study of human problem-solving behavior has had a fascination for many persons since the time of the Greeks. With the advent of the modern digital computer, and the
ability to represent complex problem-solving models as computer programs, and to study these models by executing the programs, the study of problem-solving behavior has received new impetus.

Computers offer numerous advantages in the study of human behavior. Among these advantages are the computer's ability to control numerous variables, the rigor and precision of which it is capable, its ability to examine complex relationships, its perfect reliability, the reduction in time, and its freedom from error.

However, in spite of the glowing phrases that have been used to describe computers, they are by no means a panacea to the problems of research in the area of human behavior. Coe (21) discussed their limitations (21, p. 187):

Machine limitations are relatively simple, such as adequate storage space for symbols . . . . In addition, however, the machine is an automaton - it can do exactly as it is told and no more - and this reflects the human limitation. Simulation programs can only be as good as the men who write them. At the present time the complexity of social relationships and the social scientist's knowledge about these relationships places a very real limitation on the sophistication of the program he can write.

With these limitations in mind, researchers in the behavioral sciences have found the computer a useful tool.

Gullahorn and Gullahorn (42) developed a computer model of elementary social behavior which was based on their concept of a person as an "information processing organism" (42, p. 35). The computer program,

1Technically this is not true. Programs have been written which permit the machine to "learn" and revise its programming according to instructions in the original program. In this sense, the machine is doing something that it was not told to do.
written in Information Processing Language, Version V (IPL-V), represented a "person" as a list structure containing a large number of description lists. The simulation was based on five propositions (42, pp. 356-360):

1. If in the recent past the occurrence of a particular stimulus-situation has been the occasion on which a man's activity has been rewarded, then the more similar the present stimulus-situation is to the past one, the more likely he is to emit the activity, or some similar activity now.

2. The more often within a given period of time a man's activity rewards the activity of another, the more the other will emit the activity.

3. The more valuable to a man a unit of activity another gives him, the more often he will emit activity rewarded by the activity of the other.

4. The more often a man has in the recent past received a rewarding activity from another, the less valuable any further unit of that activity becomes to him.

5. The more to a man's disadvantage the rule of distributive justice fails of realization, the more likely he is to display the emotional behavior we call anger.

On several trial runs of the simulation model, Gullahorn and Gullahorn obtained results that indicated that the computer program was doing a good job of representing the model. Unfortunately, all of their computer executions of the model were carried out using hypothetical situations and hypothetical input data. The model had not been compared to actual situations so that observed behavior could be compared to predicted or simulated behavior. Thus, the only possible conclusion was that the computer program was a valid representation of the model, but no conclusions about the validity of the model itself could be made.

Gullahorn and Gullahorn were concerned with simulating individual
behavior. Hare (48) was concerned with the computer simulation of interaction in small groups. Hare developed a computer model, which he called the Interaction Simulator, the purpose of which was to reproduce the actual content and process of small group discussion once the personality characteristics of the members and the discussion topic had been specified.

The group which was simulated was a five-man group of college undergraduates. The simulated task was the prediction of the responses of an unknown subject on the Bales-Couch Value Profile. The basic strategy behind the simulation technique was to first reproduce the process each group member used in reaching his own decision, and then combine the individual decisions into a group decision. Hare described the approach used in simulating an individual's decision (48, p. 263):

Another possibility . . . is that the subject first identifies a new item as belonging to one of a limited number of categories which include the four principal value factors [Acceptance of Authority, Need-determined Expression v. Value-determined Restraint, Equalitarianism, and Individualism] and their major combinations, and then predicts that the unknown student will answer the new item as he has answered similar items "on the average" in the past.

The predictions generated by the machine program were compared with the actual predictions of individuals and the decisions of 20 laboratory groups of five Harvard undergraduates. The average discrepancy between the prediction and the true answer for the 100 experimental subjects was 2.40. The average discrepancy for the computer making the same predictions was 2.00. Although better than the average subject, this difference was not statistically significant.

Using an IBM 650 computer, Coe (21) studied conflict, interference,
and aggression via a simulation technique. Aggression was defined as any activity intentionally designed to injure the agent or agent-surrogate of frustration and resulting in the acquiescence or compliance of the agent. A dyad was used as the unit of study, and the following assumptions concerning the dyadic relationship were made: (1) both members of the dyad were known to each other before the relationship was initiated, (2) the relationship could be terminated by either member at any time (i.e., the relationship was voluntary), (3) each member had entered into the relationship for the purpose of achieving the same goal, (4) each member had determined that the goal was beyond reach by his individual efforts, (5) each member of the dyad held some expectation of the other's role, and (6) both participants were capable of carrying out the mechanical details of their planned course of action. Each dyad was structured so that one member had been instructed to "sabotage" the efforts to complete the task. This technique was designed to produce aggression in the other member of the dyad.

The simulation program for computer execution was based on the following equation:

\[ I = [E_1 + (R-C)] \times E_2 , \]

where

- \( I \) = intention to act,
- \( E_1 \) = effectiveness,
- \( R \) = rewards,
- \( C \) = costs, and
- \( E_2 \) = expectations.
The program itself consisted of the integration of four separate programs which represented the following four processes: (1) establishment and comparison of objectives, (2) attempted goal achievement, (3) reinforcement, and (4) aggression. The trial runs, conducted under varying levels of tolerance for frustration, effectiveness, rewards, and costs, yielded results that approximated data collected in the field. The correlation between the computer results and field observations were not, however, significant.

Under the auspices of the RAND Corporation, E. A. Feigenbaum (31) engaged in research on computer simulation of human behavior. The goal of his work was the construction of a valid information processing theory of human mental function. The computer was used as an information processing tool for working out the remote consequences (or implications) of a complex set of information processing hypotheses.

Feigenbaum postulated a level of elementary information processing or symbol manipulation. He called this level the information processing level of constructing theories of cognitive processes. According to Feigenbaum, it was a level of integration higher than the level of either computer or neural organization. For purposes of computer programming, these elementary information processes were organized as programs and structures which, Feigenbaum hypothesized, were models of processes and structures used by the human mechanism. He described the simulation in the following manner (31, p. 4):

A stream of behavior emerges from the computer simulation . . . . From experiments with humans we have a stream of observed behavior . . . . The human behavior and the
model's behavior are compared for purposes of validation of the model. If the model is adequate there will be a great deal of similarity between the two streams of behavior. If there are important differences, an attempt is made to discover what is wrong or missing in the model.

Newell and Simon (62) were concerned with the computer simulation of solving problems in logic. Feigenbaum and Feldman (32) commented on the significance of their work (32, p. 277):

The psychological significance of their [Newell and Simon] work on the General Problem Solving (GPS) program derives from their success in creating a model whose behavior in solving logic problems is strikingly similar to human behavior on these same problems.

The GPS program dealt with a task environment which was made up of objects which could be transformed by various operators. The program had the capacity to detect differences in objects, and it was capable of organizing the information about the task environment into goals. A goal was made up of information which defined what constituted attainment of the goal, information which made available data relevant to goal attainment, and information which related one goal to other goals. Newell and Simon categorized all goals into three groups. The first group was composed of those goals which attempted to transform an object, A, into a second, but equivalent, object, B. The second group consisted of goals designed to reduce the difference, D, between two objects, A and B. The final group of goals was composed of those whose purpose was to apply an operator, Q, to an object, A. The basic strategy underlying the GPS system was to achieve a particular goal by establishing a set of subgoals, the attainment of which led to the attainment of the original goal. Newell and Simon illustrated this concept in the following manner (62, pp. 285-286):
Thus, to transform an object A into an object B, the objects are first matched – put into a correspondence and compared element by element. If the match reveals a difference, D, between the two objects, then a subgoal is set up to reduce this difference.

If the goal is to reduce the difference between two objects, the first step is to find an operator that is relevant to this difference. . . . If a relevant operator, Q, is found, it is subjected to a preliminary test of feasibility. . . . If the operator passes this test, a subgoal is set up to apply the operator to the object.

If the goal is to apply an operator, the first step is to see if the conditions of the operator are satisfied . . . . If the conditions are satisfied, then the output, A, can be generated. If the conditions are not satisfied, then some difference, D, has been detected and a subgoal is created to reduce this difference. . . . Similarly, if a modified object, A', is obtained, a new subgoal is formed to try to apply the operator to this new object.

In order to test the validity of the GPS program, Newell and Simon asked subjects to solve a set of problems in logic. As each subject progressed through each of the problems, he verbally recorded the reasoning he was using. The same problems were then used as input for the GPS program. Comparing the computer outputs with the recorded expressions of the human subjects, Newell and Simon found a great deal of similarity. The similarities even included mistakes. That is, both the GPS program and the human subjects were inclined to initially select approaches, which did not yield the correct solution. Based on these similarities, it was concluded that the GPS program was a valid model of human logic-problem-solving behavior.

McMillan and Gonzalez (59) were concerned with applications of computer simulation. They classified models in the following manner: (1) physical analogues, (2) schematic, (3) mathematical, and (4) computer.
One application of simulation was to use such models to analyze the behavior of systems, which McMillan and Gonzalez classified as: (1) natural versus man-made, (2) open versus closed, and (3) adaptive versus non-adaptive. The use of simulation in systems analysis has been represented by McMillan and Gonzalez in Figure 1 (59, p. 19).

![Diagram](attachment:image.png)

**Figure 1. Simulation-systems analysis**

The success of the model was then the degree of correlation between the outputs $Y_i$ and $Z_j$, where $i = 1, 2, \ldots, m$ and $j = 1, 2, \ldots, k$.

Purdy (66) investigated the interrelations between results from a management decision-making simulation game and academic aptitude and group predicted performance.

The subjects for the study were 45 male graduate students in an industrial management graduate program. Students from each fifth of the grade ranking were randomly assigned to three game sessions composed of three five-man teams each. Based on the results from these sessions, Purdy made the following conclusions (66, p. 2893):

1. Performance in decision making is not positively related to academic performance or tested aptitude for graduate study.
2. The differences between individual and team decisions became greater with practice.

D. Getzels' and Guba's Model

The model of administrative behavior selected for simulation in this study was a model originally developed by Jacob W. Getzels under the sponsorship of a Kellog Foundation grant. Later, in collaboration with Egon G. Guba, Getzels modified the original model. It was this modified version that was selected for simulation in the present study. The major source of reference on this model has been Getzels' and Guba's article which appeared in the School Review (36).

Guba and Getzels viewed the process of administration as dealing primarily with the conduct of social behavior in a hierarchical setting. Administration was to them a series of relationships between two people, one a superordinate and the other a subordinate, carried out in a social system. The hierarchical setting which was mentioned previously was a hierarchy of such superordinate-subordinate relationships, and it also served as the basis on which roles, personnel, and facilities were allocated and integrated in order to achieve the goals of the system.

Guba and Getzels divided administrative behavior into two dimensions, the nomothetic dimension and the idiographic dimension. The nomothetic dimension was composed of the elements of institution, role, and expectation, and constituted the normative dimension of activity in a social system. The idiographic dimension was made up of the elements of individual, personality, and need-disposition, and constituted the personal
dimension of activity in a social system. The following paradigm in Figure 2 illustrates the relationships between the dimensions of the model, and among the elements of the two dimensions.

![Diagram](image)

**Figure 2.** General model showing the nomothetic and the idiographic dimensions of administrative behavior

The terms of the model have been defined in Chapter I under the heading "Terminology".

Guba and Getzels described the action of the model in the following manner (36, p. 429):

... behavior results as the individual attempts to cope with an environment composed of patterns of expectations for his behavior in ways consistent with his own independent pattern of needs.

The interactive nature of behavior was expressed by the equation

\[ B = f(R \times P), \]

where \( B \) was observed behavior, \( R \) was a given institutional role defined by the expectations attached to it, and \( P \) was the personality of the particular role incumbent defined by his need-disposition.
Figure 3 graphically represents the nature of the interaction.

The rectangle represents the role and personality possibilities, while the factors which enter into a given act have been represented by a line cutting through the rectangle. As can be observed in Figure 3, considerations of personality are relatively small at point A, but at point B, personality considerations are greater than considerations of role. Another way of describing the interactive nature of the relationship between role and personality would be to say that they vary inversely with one another; i.e., as one increases, the other must decrease.

However, neither role nor personality ever completely dominates the act. Guba and Getzels explained this aspect of the interaction (36, p. 430):

When role is maximized, behavior still retains some personal aspects because no role is ever so closely defined as to eliminate all individual latitude. When personality is maximized . . . behavior still cannot be free from some role prescription.

The model points to three primary sources of conflict in the administrative setting: (1) role-personality conflicts, (2) role conflicts, and
(3) personality conflicts. In terms of the model, these three types of conflict represent incongruences in the nomothetic and idiographic dimensions, or in the interaction between the two dimensions.

The relationships among the primary elements of the model have been described in terms of effectiveness, efficiency, and satisfaction. Effectiveness, described as situational in origin and point of assessment, was defined as a function of the congruence of behavior with expectations. Efficiency, personal in origin and point of assessment, was defined as a function of the congruence of behavior with need-disposition. Satisfaction was defined as a function of the congruence of institutional expectations with individual need-disposition. These relationships have been depicted in Figure 4.

![Figure 4. Relationship of role expectations and personality needs to efficient, effective, and satisfying behavior](image-url)

Guba and Getzels identified three distinct leadership-followership styles - the nomothetic, the idiographic, and the transactional.

The nomothetic style emphasized the nomothetic dimension of behavior. As a result, the institution, the role, and the expectations received more
consideration than the individual, the personality, and the need-disposition. Guba and Getzels described the nomothetic style in the following manner (36, pp. 436-437):

In short, with the nomothetic style. . . the most expeditious route to the goal is seen as residing in the nature of the institutional structure rather than in any particular persons.

The predominant conflict that is likely to be recognized is role conflict. . . the standard of administrative excellence is institutional adjustment and effectiveness rather than individual integration and efficiency.

Placing emphasis on the requirements of the individual, the personality, and the need-disposition as opposed to the institution, the role, and the expectations, the idiographic style emphasized the idiographic dimension of behavior. The idiographic style was described by Getzels and Guba (36, p. 437):

. . . it means that the most expeditious route to the goal is seen as residing in the people involved rather than in the nature of the institutional structure.

The predominant conflict that is likely to occur is personality conflict. . . the standard of administrative excellence is individual integration and efficiency rather than institutional adjustment and effectiveness.

The transactional style represented an intermediate ground between the two previous styles. It emphasized the acquisition of a thorough awareness of limitations and resources of both the individual and institution. All three types of conflict - role, personality, and role-personality - were likely to occur, and the standard of administrative excellence was merely a combination of the previous standards with the addition of satisfaction. Figure 5 schematically represents the three
styles of leadership-followership.

Morale was understood as the result of the interaction of three variables - belongingness, rationality, and identification. Belongingness represented the anticipation, on the part of the role incumbent, that he would be able to achieve satisfaction within the institutional framework. Rationality represented the extent to which expectations placed on role were logically appropriate to the achievement of the proposed institutional goals. Identification represented the degree to which the subject was able to integrate the goals and actions of the institution into his own structure of needs and values. The relationship among these variables has been graphically represented in Figure 6.

In summary, Getzels' and Guba's model visualized administrative behavior as a composite of the institution, its roles and their expectations, and the individual's personality and need-disposition.

Several of the research studies which have already been cited used the model developed by Getzels and Guba as the basic framework underlying the research design. Those which have been cited previously include
In addition to these, Nejedlo and Farwell (61) conducted a study, the rationale for which was derived from the research conducted by Getzels, Lipham, and Campbell. Nejedlo and Farwell sought to explore relationships concerning the degree of agreement among counselors and their administrators with regard to value orientations held by each and their role expectations of the counselor. Using 266 counselors and 55 administrators, they tested the following hypotheses (61, p. 62):

1. Situations in which there is congruence in value orientations of counselors and their administrators reflect a higher extent of agreement concerning administrator's and counselor's expectations of the counselor's role than do situations in which there is divergence in value orientations.

2. Situations in which there is congruence in value orientations of counselors and their administrators reflect a higher extent of agreement concerning the counselor's
expectations of the counselor's role and the counselor's perceptions of the administrator's expectations of the counselor's role than do situations in which there is divergence in value orientations.

3. Situations in which there is congruence in value orientations of counselors and their administrators reflect a higher extent of agreement concerning the administrator's expectations of the counselor's role and the counselor's perceptions of the administrator's expectations of the counselor's role than do situations in which there is divergence in value orientations.

Based on correlation analysis, all three of these hypotheses were rejected.

Except for studies such as those cited above, no studies were found which directly tested the model of administrative behavior developed by Getzels and Guba.
III. METHODS OF PROCEDURE

The primary purpose of this study was to simulate the decision-making behavior of educational administrators. The simulation program was based on the dynamic aspects of the model of administrative behavior as developed by Getzels and Guba, and the success of the simulation was considered as a coarse measure of the validity of this model. However, because the researcher further articulated the model, and because only the dynamic aspects of the model were employed in the simulation program, the degree of success of the simulation could not be considered as an absolute measure of the validity of Getzels' and Guba's model.

This chapter outlines the methodology employed to gather and treat the data for the study. The chapter has been divided into five sections:

a. Determination of the Population
b. Description of the Instrument
c. Construction of the Instrument
d. Collection of the Data
e. Treatment of the Data

A. Determination of the Population

Because of the nature of the kind of information to be gathered from the subjects, and due to the factors of cost and time, it was not possible to select a random sample of administrators as subjects for the study. Instead, subjects for the study were selected from students enrolled in the following graduate courses in educational administration at Iowa State
University, Ames, Iowa, during the Spring Quarter of the 1967-1968 academic year:

1. Education 548 - Educational Policy Making
2. Education 678 - Administrative Theory in Education

Forty-seven students were enrolled in the first course, and 40 were enrolled in the second, making a total of 87 students from which the participants in the study were selected. A total of 30 subjects was chosen on the basis of whether or not they had had any previous administrative experience in education. All of the subjects were graduate students pursuing either a M.S., M.A., or a Ph.D. degree with a major in education.

It was assumed that this group of subjects was a representative group of educational administrators. This assumption was not unrealistic, since more and more educational administrators have returned to the classroom to pursue advanced degrees.

B. Description of the Instrument

Two instruments were administered to the subjects. One was the Edwards Personal Preference Schedule (EPPS). This instrument was employed to gather data relative to the personality need-disposition of each subject. The EPPS is an ipsative instrument. That is, theoretically, an individual could rank at the same extreme on each of the 15 traits measured. If, however, this did occur, the results of the EPPS would not reflect it. The reason for this is that due to the nature of the EPPS, if an individual scored at one extreme on certain scales, he would then
automatically have scored at the opposite extreme on certain other scales. The EPFS was administered to the subjects by the researcher, and was scored by the Testing Service at Iowa State University, Ames, Iowa.

The second instrument which was administered to the subjects was constructed, administered, and scored by the researcher (see Appendix A). The instrument, entitled Problems Requiring Educational Decision-making In Categorical Terms (PREDICT), consisted of two parts.

The first part contained items which were designed to serve two purposes. The first purpose was to identify the subject. The second purpose was to gather personal and other relevant information about the subjects. These items were included to gather data on such demographic variables as sex, age, experience, and future goals for each subject.

The second part of the instrument consisted of nine hypothetical problem situations. Corresponding to each problem situation was a set of alternative solutions. The subjects were asked to indicate which of the alternatives they would select to resolve the problem. No other choices were allowed; the selection had to be one of the listed alternatives. The problem situations themselves consisted of detailed descriptions of the nomothetic variables that governed the particular situation. These descriptions were intended to be so explicit and so complete that the nomothetic (institutional) dimension of the problem would be completely prescribed for the subject. The purpose of this structuring was to insure that the only difference would be between subjects, and not between their interpretation of the problem. When these problems were submitted to computer simulation, there was only one way in which the computer was
given the data from each problem, and it was hoped that this same uniformity could be achieved among the subjects by completely structuring the problem situations themselves.

The nine problems were divided into three categories. The first category consisted of three problems that were characterized by the emphasis which they placed on the nomothetic (institutional) dimension. The second category was made up of three problems which emphasized the idiographic (personal) dimension, while the third category consisted of three problems which presented a definite conflict between the two dimensions. Each problem on the PREDICT required an immediate decision. In other words, subjects could not avoid the issue, nor could they delay their decision.

C. Construction of the Instrument

The items in the first part of the PREDICT were determined on the basis of their relevancy to the model and the prediction of behavior. This relevancy was determined following a review of related literature (including textbooks and other studies concerned with the prediction of behavior), other rating instruments of a similar nature, and personal consultation with persons engaged in the areas of psychology, sociology, and educational administration. All of the items employed in this part of the instrument were related in some manner to the elements, or relationships between the elements, in Getzels' and Guba's model of administrative behavior.

The construction of the nine hypothetical problem situations which
made up the second part of the PREDICT was carried out in two stages: (1) the construction of the problem situation, and (2) the identification of alternative solutions for each of the problems.

Many textbooks in the field of educational administration - e.g., Campbell, Corbally, and Ramseyer (18), Campbell and Gregg (20), and Knezevich (55) - as well as some periodicals - e.g., American School Board Journal and School Management (1-12) - contain case studies of value in such a consideration. The problems were developed largely from such sources. In most instances, so that the problem would satisfy all of the requirements of the simulation technique as well as the limitations of the study, only the basic elements of the problems found in these types of sources were used.

The second stage, the identification of the alternative solutions, was a more involved task. Because the subjects would be limited in their responses to only those alternatives listed, and would not be allowed the freedom of an open-ended question, each set of alternatives would have to consist of reasonable solutions to the problems. In order to achieve this objective, a judgment panel, composed of professors of educational administration, former administrators, and practicing administrators (see Appendix B for a list of the members), was established. Each member of this panel was asked to list what he felt were the possible solutions to each problem. From the list of possible alternatives to each problem, a set of solutions to be used in the PREDICT was selected. Each set of solutions consisted of at least one solution from each of the following categories:
1. A solution which represented a strictly nomothetic approach to the problem.

2. A solution which represented a strictly idiographic approach to the problem.

3. A solution which represented a compromise between the nomothetic and idiographic approaches to the problem.

4. A solution which represented a strongly nomothetic approach to the problem, but which contained some elements of the idiographic dimension.

5. A solution which represented a strongly idiographic approach to the problem, but which contained some elements of the nomothetic dimension.

When a set of alternative solutions had been determined for each of the nine problems, the PREDICT was complete.

D. Collection of the Data

Following the construction of the PREDICT, copies of it were printed. During one evening session with the subjects, both instruments (EPPS and PREDICT) were administered. If any of the subjects was unable to attend this session, special arrangements were made for him to take the instruments at some other time. After each of the instruments was scored, the results were coded and placed on IBM data processing cards.

E. Treatment of the Data

The results of the EPPS and the first part of the PREDICT were coded and placed on IBM data processing cards. These results, in conjunction with the relevant characteristics of the problem situation, were provided
as input to the computer program for simulation. The output of the program was the selection of an alternative for each problem (the details of how the program made this selection have been provided in the following chapter of this study).

The subjects were divided into two groups. The data obtained from the first group of subjects were used to develop the simulation program to the point of maximum success. This was accomplished by repeated runs of the computer program. Following each run, a percentage of correct predictions was calculated. Based on this percentage and observed inefficiencies in the model and program, the program was modified and the data rerun. When a significant improvement in the calculated percentage of successful predictions could no longer be gained from further modifications, the point of maximum success was judged to have been attained.

At this point, the data from the second group of subjects were submitted to computer simulation. A percentage of successful predictions was again calculated. Using a non-parametric test of significance, this calculated percentage was compared to the percentage that could be expected if the predictions had been made on a strictly random basis. If the percentage of correct predictions was significantly greater than the percentage that could be expected by chance, then the simulation was successful. If the percentage of correct predictions was less than or equal to the percentage that could be expected by chance, then the simulation was not successful, and the model was not complete.
IV. DEVELOPMENT OF THE COMPUTER MODEL

A. Relationships Between Variables and Decisions

FORTRAN is an algebraic, as opposed to a list processing language. In addition, it is a scientific language, especially suited to computational problems. For these reasons it is not especially suited to problems of simulation. However, the fact that FORTRAN is a widely known language made it desirable for use in this study.

Because FORTRAN is an algebraic language and is suited to manipulating algebraic expressions and relationships, it was necessary to reduce the relationships within Getzels' and Guba's model to algebraic relationships that could be operated upon according to the syntax and grammar of the FORTRAN language. This section has described those relationships.

Behavior was considered to be a function, B, of size of school, role, expectations, need-disposition, experience, age, and sense of responsibility. This function was represented in the following manner:

\[ \text{Behavior} = B(Sz, Rl, Ex, Nd, Expr, Age, Resp). \]

The effect of any single variable was to incline the decision to be either more nomothetic or more idiographic.

Research (15) has suggested that administrators from larger schools, or administrators in a large school setting, were inclined to be more nomothetic in their actions. Thus, in the function, B, the effect of school size was to increase the inclination toward a nomothetic decision as the size of the school increased.

In addition to the obvious dichotomy of role as either a superin-
tendent or a principal, authority was used as an index of role. If the authority was commensurate with the level of decision called for, then the effect of role in the function was to increase the tendency toward an idiographic decision. If the authority was not commensurate with the level of decision called for, then the effect of role was highly nomothetic.

Stated board policy, state statutes, and expressed public sentiment were considered as the indices of the effect of expectations. The presence of either or both of the first two weighted the function in favor of a nomothetic decision, while the presence of the third added weight in the direction of an idiographic decision when the public sentiment was contrary to policy.

The need for either order or endurance could be satisfied by maintaining the status quo. Maintaining the status quo can be achieved by strict adherence to the rules and regulations which govern the system. For this reason, a need for either order or endurance was considered to weight the function in the direction of a nomothetic decision.

Strictly enforcing the rules and regulations of a system is one way an individual can satisfy a need for dominance. Thus, the effect of a need for dominance was also considered to weight the function in favor of a nomothetic decision.

The need to belong, termed affiliation, and the need to submit to the will of others, termed abasement, can be satisfied by adhering to the norms of the group. In a system such as a school district, such norms are represented by policies and rules. Hence, the weighting of the function
in the direction of a nomothetic decision was considered as the effect of the need for affiliation and abasement.

All other factors - achievement, deference, exhibition, autonomy, intraception, succorance, nurturance, change, heterosexuality, and aggressiveness - were considered to weight the function in favor of an idiographic decision since they could best be satisfied by deviating from the rules and regulations of the system and following more personal considerations.

The longer a person is a member of a system, the more aware he becomes of the norms which govern that system. This awareness makes it possible for him to know when he can and when he cannot act in a manner not completely consistent with these norms. Thus, even though a person becomes "institutionalized", he also becomes better able to act according to the dictates of his "conscience" and still maintain the norms of the system. Thus, the effect of both age and experience was considered as increasing the tendency toward an idiographic decision.

B. Development of the Program

The computer model consisted of a FORTRAN program (see Appendix B) which was executed on the IBM System/360 Model 65 digital computer housed in the Computation Center at Iowa State University, Ames, Iowa. The final model was the result of several modifications of the original. The steps followed in attaining this model have been described in this section.

The subjects were randomly divided into two equal groups, 15 in each group. One of these groups was used to supply the information which
served as the rationale for the various modifications. The other was used to make the final predictions which supplied data for the findings of this study. The process was one of cross validation.

Because of the superior diagnostics which it supplied, the WATFOR compiler was used in the process of "debugging" the initial program. The process was carried out without the data, since the purpose of "debugging" was to eliminate syntactical errors from the program. Once the program had been "debugged", the data from the first group of 15 subjects were supplied to the program. The results of this initial simulation have been summarized in Table 1. An examination of the data revealed that out of 135 predictions made, 20, or 14.81 percent, were correct.

After considering the values generated by the program, it was decided to reduce all weights by a factor of four in order to bring the values into the proper perspective. When this was done, the second execution of the simulation program yielded 28, or 20.74 percent, correct predictions. The results of this simulation have been summarized in Table 2.

The next step in the modification was to include a correction term for each prediction attempt. This term was a measure of how far from or how near to the observed alternative the predicted alternative had been. The data in Table 3 represented the results of the simulation using this correction term. An examination of these data revealed that 35, or 25.93 percent, of the predictions were correct.

A series of attempts, employing various techniques, failed to result in any significant improvement in the percentage of successful predictions. Finally, each problem was examined over all of the subjects. It was
Table 1. Observed and predicted decisions for the first group of fifteen subjects on the first simulation

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aObserved.  
bPredicted.

discovered that on some problems the percentage of success was quite good, while on others it was very poor. Dropping the correction for error, and adding a correction dependent upon the problem rather than the previous prediction, a fourth simulation was executed. The results of this simulation have been presented in Table 4. An examination of the data contained
Table 2. Observed and predicted decisions for the first group of fifteen subjects on the second simulation

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^a^Observed.

^b^Predicted.
Table 3. Observed and predicted decisions for the first group of fifteen subjects on the third simulation

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\(^{a}\)Observed.

\(^{b}\)Predicted.
Table 4. Observed and predicted decisions for the first group of fifteen subjects on the fourth simulation

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\(^a\)Observed.  
\(^b\)Predicted.
Table 5. Observed and predicted decisions for the first group of fifteen subjects on the fifth simulation

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\(^a^\text{Observed.}\)

\(^b^\text{Predicted.}\)
in Table 4 revealed that 55, or 40.74 percent, of the predictions were correct.

The process of correcting for each problem was repeated and a fifth execution of the simulation program was made. Again, an improvement in the number of successful predictions was observed. The results have been recorded in Table 5. An examination of the data contained in Table 5 revealed that 66, or 48.89 percent, of the predictions were correct. In addition, 28 predicted alternatives differed in magnitude by 50 or less from the observed alternative. That is, the difference between the weights assigned to the predicted and observed alternatives was 50 or less. Thus, a total of 94, or 69.62 percent, successful predictions were observed when success was defined as a difference of less than or equal to the absolute value of 50 between the predicted and observed decision.

Further attempts yielded no significant improvement in the number of successful predictions. Therefore, the program used to generate the results summarized in Table 5 was adopted as the final computer model.

C. Description of the Program

The actual FORTRAN code used for this study has been presented in Appendix B. A verbal description of what that program was designed to do has been presented in the following paragraphs.

1. Main program

A standard set of control cards for use with the WATFOR compiler was supplied by the Computation Center at Iowa State University. These cards
provided a time allocation of one minute, and a memory allocation of size 128K, for each execution of the program. Both of these parameters were found to be adequate.

The first step in the program was to read the data into the computer and store it in the proper location in memory. The first group of data to be read in was information about the nine hypothetical problem situations. These data were stored in a 9 by 10 array called PROB. Each row of this array represented a problem, and each element of the row contained a unique item of information about the respective problem. The data consisted of ten coded values (see Appendix C) which represented the size of school, role, three measures of expectation, and the weights assigned to each of the five alternative solutions. The manner in which these data were read into the computer and were subsequently stored in memory has been depicted by the flow-chart on the first page of Figure 7.

The flow-chart on the second page of Figure 7 depicted the manner in which the information about the subjects, and the weights assigned to the factors on the Edwards Personal Preference Schedule, were read into and stored by the computer. Information about the subjects, including their responses to the questionnaire, their decisions on the nine problems, and their scores on the Edwards Personal Preference Schedule were stored in a 15 by 52 array named SUBJ. Each row of this array contained all the information about one subject. The first 28 elements of a row contained the coded responses of the subject to the items on the first part of the questionnaire. Elements 29 through 43 of a row contained the subject's percentile ranking on each of the 15 factors on the Edwards Personal
Preference Schedule. The last nine elements of a row, elements 44 through 52, contained the subject's decision on each of the nine problems.

The weights assigned to the factors on the Edwards Personal Preference Schedule were stored in an array named COEF. Each of the 15 elements of this one dimensional array contained either a +1 or a -1. A -1 meant that the factor represented by that element's position would incline the decision to be more nomothetic. A +1 meant that the factor represented by that element's position would incline the decision to be more idiographic.

After the data had been read into the computer and had been stored in the appropriate arrays, the actual task of simulation was begun. Although the program called for the simulation routine to be executed 135 times, once for each of the nine problems for each of the 15 subjects, it has been necessary to describe the routine only once, for a single subject and a single problem.

After certain variables had been assigned an initial value, the program instructed the computer to examine the percentile rank on each of the 15 factors on the Edwards Personal Preference Schedule (elements 29 through 43 of a row in the SUBJ-array). If the percentile rank was greater than or equal to 50, it was multiplied by the corresponding element of the COEF-array, and the product added to the current value of the variable called SUM. This process has been schematically represented by the flow-chart on the third page of Figure 7. The value of SUM was then printed.

The next step was to add to the value of SUM the algebraic values assigned to the following variables: (1) age, (2) experience, (3) sense
of responsibility, and (4) size of school. In order to carry out these steps, the program instructed the computer to locate the appropriate element in the SUBJ-array and, depending upon the coded value found therein, to carry out certain algebraic operations upon this value. The algebraic result of these operations was then added to SUM. The exact operations which were performed on each value and the mechanical system for carrying out these operations have been diagramatically represented by the flow-chart on the fourth, fifth, and sixth pages of Figure 7.

Because the value which was currently assigned to SUM would remain constant for a given subject, it was stored in a location called SUMSTR and its value was printed. The last three "boxes" of the flow-chart on the sixth page of Figure 7 represents this part of the program.

For each problem, the coded values assigned to the first five elements of the PROB-array - representing size of school, role, and three measures of expectation - were added to SUM. Then, the observed decision was stored in a location named N, the variables NUM, LL, and K were set equal to 0, and the variable M was set equal to the element in the SUBJ-array which corresponded to the problem under consideration. Using SUM, I, J, NUM, DIFF, N, K, and LL as parameters, the PREDIC-subroutine was invoked. The flow-chart on the seventh page of Figure 7 has been presented to illustrate these processes.

Upon return from the PREDIC-subroutine, the variable named TOTAL was incremented by 1. The variable named SUCC was incremented by 1 only if the predicted decision matched the observed decision. Once the simulation had been executed nine times for each of the 15 subjects, a percentage
of correct predictions was calculated by dividing the variable SUCC by TOTAL and multiplying the obtained quotient by 100. The printing out of this value, called PERCNT, represented the end of the simulation program.

2. The PREDIC-subroutine

The flow-chart appearing on the four pages of Figure 8 represents the processes employed in the subroutine named PREDIC.

The flow-chart contained on the first two pages and the top portion of the third page of Figure 8 depicts the algebraic operations to be performed on the variable SUM, each step in the flow-chart representing a different problem. Once the problem had been identified and the appropriate operations had been performed on SUM, the decision which minimized the difference between its value and the current value of SUM was determined. This decision was then returned to the main program as the predicted decision. This process was carried out for each problem, with the exception of problems 3 and 7. In these two instances, based on results obtained from the first group of subjects, the third alternative was automatically returned as the predicted decision. The flow-charts on the third and fourth pages of Figure 8 represent these actions. Once a predicted decision had been returned to the main program, the PREDIC-subroutine was terminated.

A comparison of the FORTRAN program presented in Appendix B with the flow-charts in Figure 7 and Figure 8 would reveal certain inconsistencies. Certain aspects of the program, particularly those
designed to provide purely analytical data, have been omitted from the flow-charts because they were not a part of the simulation program.
Figure 7. Flow-chart for the main computer program
Figure 7. (Continued)
Figure 7. (Continued)
PRINT SUM

SUBJ(I,3) = 0 ?

NO

AGE = SUBJ(I,3) * 10 + 10

AGE = SUBJ(I,3) * 10 + 10

SUM = SUM + AGE

SUBJ(I,17) = 0 ?

NO

EXP = SUBJ(I,17) + 10

EXP = SUBJ(I,17) * 30 + 10

SUM = SUM + EXP

SUBJ(I,21) = 0 ?

NO

RESP = SUBJ(I,21) - 100

CONTINUE

Figure 7. (Continued)
Figure 7. (Continued)
SUBJ(I,16)=3 ?

YES

GO TO STEP8

NO

SUM=SUM-SUBJ(I,16)*8-1

SUBJ(I,16)=4 ?

YES

GO TO STEP8

NO

SUM=SUM-SUBJ(I,16)*12-2

SUBJ(I,16)=5 ?

YES

SUM=SUM+SUBJ(I,16)-6

SUM=SUM-SUBJ(I,16)*20

NO

STEP8:

SUMSTR=SUM

SUMSTR=SUMSTR-400

PRINT SUMSTR

DIFF=0

CONTINUE

Figure 7. (Continued)
Figure 7. (Continued)
Figure 7. (Continued)
SUBROUTINE PREDIC(SUM, I, J, NUM, DIFF, N, K, LL)

J = 1?

YES

NO

GO TO STEP4

SUM = SUM + 53

J = 2?

YES

NO

GO TO STEP4

SUM = SUM + 80

J = 3?

YES

NO

GO TO STEP5

SUM = SUM - 151

J = 4?

YES

NO

GO TO STEP4

SUM = SUM + 138

CONTINUE

Figure 8. Flow-chart for the PREDIC-subroutine
Figure 8. (Continued)
Figure 8. (Continued)
Figure 8. (Continued)
V. FINDINGS

A. Introduction

The data for this study were obtained from the following four sources: (1) results on the Edwards Personal Preference Schedule, (2) responses to the questionnaire, (3) observed decisions on each of the nine hypothetical problems, and (4) computer print outs. For the purposes of presentation in this chapter, however, the data were combined to form two categories - selected characteristics of the subjects, and results of the simulation. The selected characteristics of the subjects have been presented in the following section, while the results of the simulation have been presented in the final section of this chapter.

B. Selected Characteristics of the Subjects

All thirty subjects used in this study were male, and all but one of the subjects were married.

The data contained in Table 6 represented the distribution of the subjects by age. An examination of these data revealed that 24, or 80.0 percent, of the subjects were between 30 and 39 years of age.

The distribution of the subjects according to their present position has been portrayed by the data in Table 7. The classification denoted as "Other" included such positions as personnel officer in a junior college, an administrator in an area vocational school, and an assistant to the dean of a university.
Table 6. Frequency distribution of subjects by age

<table>
<thead>
<tr>
<th>Interval</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 25</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>25-29</td>
<td>3</td>
<td>10.0</td>
</tr>
<tr>
<td>30-34</td>
<td>12</td>
<td>40.0</td>
</tr>
<tr>
<td>35-39</td>
<td>12</td>
<td>40.0</td>
</tr>
<tr>
<td>40-44</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>45-49</td>
<td>2</td>
<td>6.7</td>
</tr>
<tr>
<td>50-54</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>55-59</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>60-64</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>65 or over</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Table 7. Frequency distribution of subjects by present position

<table>
<thead>
<tr>
<th>Position</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td>7</td>
</tr>
<tr>
<td>Superintendent</td>
<td>3</td>
</tr>
<tr>
<td>High school principal</td>
<td>2</td>
</tr>
<tr>
<td>Junior high school principal</td>
<td>0</td>
</tr>
<tr>
<td>Elementary Principal</td>
<td>3</td>
</tr>
<tr>
<td>Teacher</td>
<td>1</td>
</tr>
<tr>
<td>Assistant principal (sr. high)</td>
<td>1</td>
</tr>
<tr>
<td>Assistant principal (jr. high)</td>
<td>0</td>
</tr>
<tr>
<td>Counselor</td>
<td>0</td>
</tr>
<tr>
<td>Department of Public Instruction</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>9</td>
</tr>
</tbody>
</table>
The positions held by the subjects prior to their present positions have been reported in Table 8. Because each subject could have indicated more than one prior position, the total is larger than the number of subjects involved in the study.

Table 8. Positions held by the subjects prior to their present positions

<table>
<thead>
<tr>
<th>Position</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superintendent</td>
<td>7</td>
</tr>
<tr>
<td>High school principal</td>
<td>13</td>
</tr>
<tr>
<td>Junior high school principal</td>
<td>9</td>
</tr>
<tr>
<td>Elementary principal</td>
<td>2</td>
</tr>
<tr>
<td>Teacher</td>
<td>26</td>
</tr>
<tr>
<td>Assistant principal (sr. high)</td>
<td>1</td>
</tr>
<tr>
<td>Assistant principal (jr. high)</td>
<td>2</td>
</tr>
<tr>
<td>Counselor</td>
<td>3</td>
</tr>
<tr>
<td>Department of Public Instruction</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>10</td>
</tr>
</tbody>
</table>

Those subjects who were presently in a public school position were asked to indicate the approximate enrollment in their school or district, depending on their position within the system. If they were not presently in a public school position, they were asked to mark the response "Does not apply". The subjects' responses appear in Table 9.

One of the criteria upon which the selection of the subjects was based was that they had at least one year of administrative experience. An examination of the data contained in Table 10 revealed that 23, or 76.6 percent, of the subjects had at least five years of administrative experience.
Table 9. Frequency distribution of subjects by school size

<table>
<thead>
<tr>
<th>Enrollment</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 100</td>
<td>0</td>
</tr>
<tr>
<td>100-499</td>
<td>4</td>
</tr>
<tr>
<td>500-999</td>
<td>4</td>
</tr>
<tr>
<td>1000-1499</td>
<td>1</td>
</tr>
<tr>
<td>1500-1999</td>
<td>3</td>
</tr>
<tr>
<td>2000 or more</td>
<td>1</td>
</tr>
<tr>
<td>Does not apply</td>
<td>17</td>
</tr>
</tbody>
</table>

Table 10. Frequency distribution of subjects based on the number of years of administrative experience

<table>
<thead>
<tr>
<th>Years</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 or less</td>
<td>1</td>
</tr>
<tr>
<td>2-4</td>
<td>6</td>
</tr>
<tr>
<td>5-9</td>
<td>16</td>
</tr>
<tr>
<td>10 or more</td>
<td>7</td>
</tr>
</tbody>
</table>

A total of 28, or 93.3 percent, of the subjects held a degree equivalent to or higher than either a M.A. or a M.S. The number of subjects who held each degree has been reported in Table 11.

The subjects' expressed senses of responsibility as a superintendent and as a principal have been summarized in Table 12. Thirteen, or 43.3
Table 11. Frequency distribution of subjects by highest degree held

<table>
<thead>
<tr>
<th>Degree</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.A. or B.S.</td>
<td>2</td>
</tr>
<tr>
<td>M.A. or M.S.</td>
<td>16</td>
</tr>
<tr>
<td>Specialist (Masters + 45)</td>
<td>8</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 12. Frequency distribution of subjects by expressed sense of responsibility as a principal and as a superintendent

<table>
<thead>
<tr>
<th>Role</th>
<th>Responsible to</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Board</td>
</tr>
<tr>
<td>Principal</td>
<td>0</td>
</tr>
<tr>
<td>Superintendent</td>
<td>13</td>
</tr>
</tbody>
</table>

percent, of the subjects expressed the opinion that they would feel most responsible to their board of education if they were a superintendent. Ten of the subjects, or 33.3 percent, said they would feel most responsible to their superintendent if they were a principal. Eleven, or 36.7 percent, said they would feel most responsible to their students if they were a principal. Only ten, or 33.3 percent, of the subjects expressed the opinion that they would feel most responsible to their staff as either a superintendent or a principal.
C. Results of the Simulation

1. Introduction

The results of the simulation were considered in two ways. First, only those cases where the observed decision and the predicted decision matched exactly were considered as successes. A percentage of successes was calculated by dividing the number of successes by the total number of predictions (135 in all instances). The obtained value was then tested to determine whether as good or better results could have been obtained by making the predictions on a purely random basis. If the percentage of successes achieved by simulation was significantly greater than that which could be expected by chance, then the simulation was considered to have achieved a certain degree of success, and the model was considered to have a certain degree of predictive validity. If the percentage of successes achieved by simulation was not significantly greater than that which could have been expected by chance, then the simulation was considered to have failed, and no conclusions about the predictive validity of the model could be established.

The second manner in which the results of the simulation were considered involved a modification in the definition of a successful prediction. In this consideration, those cases in which the weights assigned to the predicted and the observed decisions respectively differed in magnitude by a value of 50 or less were counted as successes. For example, if the observed decision had been assigned a weight of +100 and the predicted value had an assigned weight of +50, then this was counted as a success. The calculation of a percentage of successes, the testing
of this value, and the conclusions made were the same as described in the preceding paragraph.

2. Results based on exact matches and proximity of decisions

The subjects' scores, in terms of percentile rank, on the Edwards Personal Preference Schedule have been listed in Table 13. These values were assigned appropriate weights (see Appendix C) and were read into the computer to be used in the simulation program.

The data contained in Table 14 represented the observed and predicted decisions and the differences between them, on the nine problems for subject number 3. An examination of the data contained in Table 14 revealed that three exact matches were obtained, problems 3, 6, and 7, and two, problem 4 and problem 5, were within 50 of the observed decision.

For subject number 8, matches were obtained on problems 4, 7, and 8, and the predicted decision was within 50 of the observed decision on problems 1, 3, and 9. These findings have been presented in Table 15.

Table 16 summarized the observed and predicted decisions and the differences between them, for subject number 15. An analysis of the data contained in Table 16 showed that matches had been obtained on six of the nine problems, and that the predicted decision had been within 50 of the observed decision on one additional problem. The exact matches were obtained on problems 2, 4, 5, 6, 7, and 9, while the predicted decision on problem 3 was within 50 of the observed decision.

For three of the problems, numbers 2, 4, and 7, exact matches between the observed and predicted decisions were obtained for subject number 18. On four problems, numbers 1, 3, 6, and 8, the predicted and observed
Table 13. Subjects' scores, in terms of percentile rank, on the Edwards Personal Preference Schedule

<table>
<thead>
<tr>
<th>Subject number</th>
<th>Percentile rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ach</td>
</tr>
<tr>
<td>1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>29</td>
</tr>
<tr>
<td>2&lt;sup&gt;a&lt;/sup&gt;</td>
<td>86</td>
</tr>
<tr>
<td>3&lt;sup&gt;b&lt;/sup&gt;</td>
<td>27</td>
</tr>
<tr>
<td>4&lt;sup&gt;a&lt;/sup&gt;</td>
<td>98</td>
</tr>
<tr>
<td>5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>10</td>
</tr>
<tr>
<td>6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>56</td>
</tr>
<tr>
<td>7&lt;sup&gt;a&lt;/sup&gt;</td>
<td>37</td>
</tr>
<tr>
<td>8&lt;sup&gt;b&lt;/sup&gt;</td>
<td>96</td>
</tr>
<tr>
<td>9&lt;sup&gt;a&lt;/sup&gt;</td>
<td>86</td>
</tr>
<tr>
<td>10&lt;sup&gt;a&lt;/sup&gt;</td>
<td>91</td>
</tr>
<tr>
<td>11&lt;sup&gt;a&lt;/sup&gt;</td>
<td>46</td>
</tr>
<tr>
<td>12&lt;sup&gt;a&lt;/sup&gt;</td>
<td>10</td>
</tr>
<tr>
<td>13&lt;sup&gt;a&lt;/sup&gt;</td>
<td>29</td>
</tr>
<tr>
<td>14&lt;sup&gt;b&lt;/sup&gt;</td>
<td>74</td>
</tr>
<tr>
<td>15&lt;sup&gt;a&lt;/sup&gt;</td>
<td>86</td>
</tr>
<tr>
<td>16&lt;sup&gt;a&lt;/sup&gt;</td>
<td>56</td>
</tr>
<tr>
<td>17&lt;sup&gt;a&lt;/sup&gt;</td>
<td>86</td>
</tr>
<tr>
<td>18&lt;sup&gt;b&lt;/sup&gt;</td>
<td>91</td>
</tr>
<tr>
<td>19&lt;sup&gt;a&lt;/sup&gt;</td>
<td>46</td>
</tr>
<tr>
<td>20&lt;sup&gt;b&lt;/sup&gt;</td>
<td>46</td>
</tr>
<tr>
<td>21&lt;sup&gt;b&lt;/sup&gt;</td>
<td>65</td>
</tr>
<tr>
<td>22&lt;sup&gt;b&lt;/sup&gt;</td>
<td>98</td>
</tr>
<tr>
<td>23&lt;sup&gt;b&lt;/sup&gt;</td>
<td>81</td>
</tr>
<tr>
<td>24&lt;sup&gt;b&lt;/sup&gt;</td>
<td>37</td>
</tr>
<tr>
<td>25&lt;sup&gt;b&lt;/sup&gt;</td>
<td>37</td>
</tr>
<tr>
<td>26&lt;sup&gt;b&lt;/sup&gt;</td>
<td>94</td>
</tr>
<tr>
<td>27&lt;sup&gt;b&lt;/sup&gt;</td>
<td>63</td>
</tr>
<tr>
<td>28&lt;sup&gt;b&lt;/sup&gt;</td>
<td>84</td>
</tr>
<tr>
<td>29&lt;sup&gt;b&lt;/sup&gt;</td>
<td>94</td>
</tr>
<tr>
<td>30&lt;sup&gt;b&lt;/sup&gt;</td>
<td>74</td>
</tr>
</tbody>
</table>

<sup>a</sup>Indicates that this subject was a member of the first group of subjects.

<sup>b</sup>Indicates that this subject was a member of the second group of subjects.
Table 14. Observed and predicted decisions, and the differences between them, on the nine hypothetical problems for subject number 3

<table>
<thead>
<tr>
<th>Problem number</th>
<th>Observed</th>
<th>Predicted</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>4</td>
<td>-150</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>5</td>
<td>-100</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>5</td>
<td>-50</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>2</td>
<td>-50</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td>2</td>
<td>-100</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
<td>1</td>
<td>-200</td>
</tr>
</tbody>
</table>

Number 15. Observed and predicted decisions, and the differences between them, on the nine hypothetical problems for subject number 8

<table>
<thead>
<tr>
<th>Problem number</th>
<th>Observed</th>
<th>Predicted</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>3</td>
<td>150</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>3</td>
<td>-50</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>5</td>
<td>-100</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td>5</td>
<td>50</td>
</tr>
</tbody>
</table>
Table 16. Observed and predicted decisions, and the differences between them, on the nine hypothetical problems for subject number 15

<table>
<thead>
<tr>
<th>Problem number</th>
<th>Observed</th>
<th>Predicted</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>1</td>
<td>200</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>3</td>
<td>-50</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>1</td>
<td>200</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

decisions were within 50 of one another. These findings have been presented in Table 17.

An examination of the data contained in Table 18 revealed that for subject number 20, only one exact match between the observed and predicted decisions had been obtained, that match occurring on problem 6. On only two problems, number 7 and number 8, was the difference between the observed and predicted decision less than or equal to the absolute value of 50.

For subject number 21, the difference between the observed and predicted decision was less than or equal to the absolute value of 50 on problems 1, 5, 7, and 9. Exact matches were obtained on problem 3 and problem 8. These results have been recorded in Table 19.

The observed and predicted decisions and the differences between them, for subject number 22 have been recorded in Table 20. An inspection of these data disclosed the fact that three exact matches and five "near
Table 17. Observed and predicted decisions, and the differences between them, on the nine hypothetical problems for subject number 18

<table>
<thead>
<tr>
<th>Problem number</th>
<th>Observed</th>
<th>Predicted</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>3</td>
<td>-50</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>3</td>
<td>-50</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>1</td>
<td>50</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td>3</td>
<td>-50</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>4</td>
<td>150</td>
</tr>
</tbody>
</table>

Table 18. Observed and predicted decisions, and the differences between them, on the nine hypothetical problems for subject number 20

<table>
<thead>
<tr>
<th>Problem number</th>
<th>Observed</th>
<th>Predicted</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>1</td>
<td>150</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>3</td>
<td>-100</td>
</tr>
<tr>
<td>4</td>
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<td>1</td>
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<td>150</td>
</tr>
<tr>
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<td>1</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>5</td>
<td>3</td>
<td>50</td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td>2</td>
<td>150</td>
</tr>
</tbody>
</table>
Table 19. Observed and predicted decisions, and the differences between them, on the nine hypothetical problems for subject number 21

<table>
<thead>
<tr>
<th>Problem number</th>
<th>Observed</th>
<th>Predicted</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>2</td>
<td>-50</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>2</td>
<td>-150</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>4</td>
<td>-200</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>2</td>
<td>-50</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>5</td>
<td>-200</td>
</tr>
<tr>
<td>7</td>
<td>5</td>
<td>3</td>
<td>50</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td>1</td>
<td>-50</td>
</tr>
</tbody>
</table>

Table 20. Observed and predicted decisions, and the differences between them, on the nine hypothetical problems for subject number 22

<table>
<thead>
<tr>
<th>Problem number</th>
<th>Observed</th>
<th>Predicted</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>2</td>
<td>-50</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>2</td>
<td>-50</td>
</tr>
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<td>3</td>
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</tr>
<tr>
<td>4</td>
<td>4</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>2</td>
<td>-50</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>2</td>
<td>-100</td>
</tr>
<tr>
<td>7</td>
<td>5</td>
<td>3</td>
<td>50</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td>1</td>
<td>-50</td>
</tr>
</tbody>
</table>
misses" had been obtained. On problems 3, 4, and 8 the predicted decision exactly matched the observed decision. The difference between the observed decision and the predicted decision was less than or equal to the absolute value of 50 on problems 1, 2, 5, 7, and 9.

The data contained in Table 21 represented the observed and predicted decisions and the differences between them, for subject number 23. Exact matches were obtained for only two problems, number 7 and number 8. A difference in magnitude of 50 between the observed and predicted decision was noted for problems 5, 6, and 9.

Table 21. Observed and predicted decisions, and the differences between them, on the nine hypothetical problems for subject number 23

<table>
<thead>
<tr>
<th>Problem number</th>
<th>Observed</th>
<th>Predicted</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>5</td>
<td>-100</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>1</td>
<td>150</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>3</td>
<td>-100</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>1</td>
<td>150</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>5</td>
<td>-50</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>1</td>
<td>50</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td>5</td>
<td>50</td>
</tr>
</tbody>
</table>

An inspection of the data contained in Table 22 revealed that the predicted decision exactly matched the observed decision on problems 2 and 7. Further examination revealed that on problems 3, 5, and 6, the difference between the predicted decision and the observed decision was less than 50 in absolute value.
Table 22. Observed and predicted decisions, and the differences between them, on the nine hypothetical problems for subject number 24

<table>
<thead>
<tr>
<th>Problem number</th>
<th>Observed</th>
<th>Predicted</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>3</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
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<td>3</td>
<td>-50</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>5</td>
<td>-50</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>1</td>
<td>50</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>3</td>
<td>-150</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td>4</td>
<td>100</td>
</tr>
</tbody>
</table>

For only two problems, numbers 1 and 3, were exact matches between the predicted and observed decisions obtained for subject number 25. In addition, the difference between the observed and predicted decision was equal to or less than the absolute value of 50 on only two problems, number 2 and number 7. These findings have been portrayed in Table 23.

Table 23. Observed and predicted decisions, and the differences between them, on the nine hypothetical problems for subject number 25

<table>
<thead>
<tr>
<th>Problem number</th>
<th>Observed</th>
<th>Predicted</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
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<td>50</td>
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<tr>
<td>3</td>
<td>3</td>
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<tr>
<td>4</td>
<td>3</td>
<td>1</td>
<td>100</td>
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<tr>
<td>5</td>
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<td>200</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>7</td>
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<tr>
<td>8</td>
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<tr>
<td>9</td>
<td>3</td>
<td>2</td>
<td>150</td>
</tr>
</tbody>
</table>
The observed and predicted decisions and the differences between them, for subject number 26 have been recorded in Table 24. Exact matches were obtained on problems 4, 5, 7, and 8. For none of the remaining problems was the difference between the observed and predicted decision less than or equal to the absolute value of 50.

Table 24. Observed and predicted decisions, and the differences between them, on the nine hypothetical problems for subject number 26

<table>
<thead>
<tr>
<th>Problem number</th>
<th>Observed</th>
<th>Predicted</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>1</td>
<td>200</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>1</td>
<td>200</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>3</td>
<td>-100</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
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<td>1</td>
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</tr>
<tr>
<td>6</td>
<td>4</td>
<td>1</td>
<td>150</td>
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<tr>
<td>7</td>
<td>3</td>
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<tr>
<td>9</td>
<td>1</td>
<td>2</td>
<td>200</td>
</tr>
</tbody>
</table>

For subject number 27, exact matches between the observed and predicted decisions were obtained on problems 1, 3, and 8. A difference equal in magnitude to 50 was obtained on problems 7 and 9. These results appear in Table 25.

The data contained in Table 26 represented the observed and predicted decisions and the differences between them, on the nine problems for subject number 28. A study of these data disclosed the fact that only one exact match, problem number 6, had been obtained. On four problems, however, the difference between the observed decision and the predicted decision was equal to the absolute value of 50. These four problems were
Table 25. Observed and predicted decisions, and the differences between them, on the nine hypothetical problems for subject number 27

<table>
<thead>
<tr>
<th>Problem number</th>
<th>Observed</th>
<th>Predicted</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
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<td>2</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
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<tr>
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<tr>
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<td>3</td>
<td>-100</td>
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<tr>
<td>5</td>
<td>4</td>
<td>2</td>
<td>-150</td>
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<tr>
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</tr>
<tr>
<td>8</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td>1</td>
<td>-50</td>
</tr>
</tbody>
</table>

Table 26. Observed and predicted decisions, and the differences between them, on the nine hypothetical problems for subject number 28

<table>
<thead>
<tr>
<th>Problem number</th>
<th>Observed</th>
<th>Predicted</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>150</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>1</td>
<td>50</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>3</td>
<td>-50</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>1</td>
<td>150</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
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<td>0</td>
</tr>
<tr>
<td>7</td>
<td>5</td>
<td>3</td>
<td>50</td>
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<tr>
<td>8</td>
<td>4</td>
<td>3</td>
<td>-50</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>4</td>
<td>150</td>
</tr>
</tbody>
</table>
problem number 2, problem number 3, problem number 7, and problem number 8.

Exact matches were observed for subject number 29 on problems 1, 2, 3, and 7. On problems 4, 5, and 9, the difference between the observed and predicted decision was equal in magnitude to 50. These findings have been presented in Table 27.

Table 27. Observed and predicted decisions, and the differences between them, on the nine hypothetical problems for subject number 29

<table>
<thead>
<tr>
<th>Problem number</th>
<th>Observed</th>
<th>Predicted</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
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<tr>
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<td>2</td>
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<tr>
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<td>2</td>
<td>-50</td>
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<tr>
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<td>4</td>
<td>-150</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>2</td>
<td>-200</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td>1</td>
<td>-50</td>
</tr>
</tbody>
</table>

An examination of the data contained in Table 28 revealed that exact matches were obtained on problems 1 and 9. The difference between the observed decision and the predicted decision was equal to the absolute value of 50 on problems 3, 5, 6, 7, and 8.

3. Analysis of the results

When success was defined as an exact match between the predicted and the observed decision, 41, or 30.37 percent, of the predictions resulted
Table 28. Observed and predicted decisions, and the differences between them, on the nine hypothetical problems for subject number 30

<table>
<thead>
<tr>
<th>Problem number</th>
<th>Observed</th>
<th>Predicted</th>
<th>Difference</th>
</tr>
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<tbody>
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<tr>
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<td>3</td>
<td>-50</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>3</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
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<td>1</td>
<td>50</td>
</tr>
<tr>
<td>7</td>
<td>5</td>
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</tr>
<tr>
<td>9</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

in success. The data contained in Table 29 represented the number of individual successes for each problem and each subject, as well as the total number of successes, when success was defined as above.

Using the formula

$$Z = \frac{f - m}{s_f}$$

where: $f =$ observed frequency of correct matches,

$m =$ expected number of correct matches, and

$s_f =$ sample variance of the frequency, $f$,

a value of 3.0012 was obtained for $Z$. When this value was compared with a table of the normal distribution (29, pp. 350-359), it was found that the probability of a frequency as great or equal to 41 was 0.0013. The conclusion was that the simulation process made significantly more successful predictions than could reasonably be attributed to chance.

The number of individual successes for each problem and each subject
Table 29. Number of individual successes for each problem and each subject, as well as the total number of successes, when success was defined as an exact match between the observed and the predicted decision.

<table>
<thead>
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<th>Subject number</th>
<th>Problem number</th>
<th>Total</th>
</tr>
</thead>
<tbody>
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<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>F(^a)</td>
<td>F</td>
</tr>
<tr>
<td>8</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>15</td>
<td>F</td>
<td>S</td>
</tr>
<tr>
<td>18</td>
<td>F</td>
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<td>29</td>
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<td>F</td>
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<tr>
<td>Total</td>
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<td>4</td>
</tr>
</tbody>
</table>

\(^a\text{Failure}\)

\(^b\text{Success}\)
as well as the total number of successes, when success was defined as any instance in which the difference between the observed and predicted decision was less than or equal to the absolute value of 50, appeared in Table 30. An examination of the information contained therein revealed that 84, or 62.22 percent, of the predictions had resulted in success, when success was defined as above.

Using the formula previously described, a value of $Z$ of 2.379 was obtained. Using a table for the normal distribution, it was found that the probability of obtaining a frequency equal to or greater than 84 was .0087. Again, the conclusion was that the simulation process made significantly more successful predictions than could reasonably be attributed to chance.
Table 30. Number of individual successes for each problem and each subject, as well as the total number of successes, when success was defined as any instance in which the difference between the observed and predicted decision was less than or equal to the absolute value of 50

<table>
<thead>
<tr>
<th>Subject number</th>
<th>Problem number</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>Total</th>
</tr>
</thead>
<tbody>
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<td>F</td>
<td>S&lt;sup&gt;b&lt;/sup&gt;</td>
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<td>S</td>
<td>S</td>
<td>S</td>
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<td>8</td>
<td>15</td>
<td>10</td>
<td>8</td>
<td></td>
<td>84</td>
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</tbody>
</table>

<sup>a</sup>Failure.

<sup>b</sup>Success.
VI. DISCUSSION

A. Selected Characteristics of the Subjects

The average age of the subjects used in this study was 35.2 years, while the median age was 34.0. It was interesting to note that only ten percent of the subjects were over 40 years old. This would seem to imply that those administrators who have returned to the classroom represent the "younger generation" of administrators.

The fact that 23, or 76.6 percent, of the subjects had at least five years of administrative experience was consistent with the characteristics of their age distribution. It also gave support to the assumption that the subjects used in this study would not find new or unique the task of making an administrative decision.

An interesting observation was made in relation to the subjects' expressed sense of responsibility. As was reported in the previous chapter, 43.3 percent of the subjects expressed the opinion that as a superintendent they would feel most responsible to their board; 33.3 percent said that as a principal they would feel most responsible to their superintendent. Only one-third, 33.3 percent, expressed the opinion that they would feel most responsible to their staff as either a superintendent or as a principal.

Table 31 contains the averages of the percentile ranks for the 30 subjects on the results of the Edwards Personal Preference Schedule. The factors have been listed in rank order, the highest appearing at the top and the lowest appearing at the bottom.
Table 31. Average percentile rankings for the fifteen factors on the Edwards Personal Preference Schedule, presented in rank order

<table>
<thead>
<tr>
<th>Factor</th>
<th>Average percentile rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominance</td>
<td>82.5</td>
</tr>
<tr>
<td>Exhibition</td>
<td>68.2</td>
</tr>
<tr>
<td>Achievement</td>
<td>63.8</td>
</tr>
<tr>
<td>Affiliation</td>
<td>63.2</td>
</tr>
<tr>
<td>Heterosexuality</td>
<td>61.6</td>
</tr>
<tr>
<td>Intraception</td>
<td>59.4</td>
</tr>
<tr>
<td>Autonomy</td>
<td>58.4</td>
</tr>
<tr>
<td>Aggressiveness</td>
<td>52.3</td>
</tr>
<tr>
<td>Change</td>
<td>51.0</td>
</tr>
<tr>
<td>Nurturance</td>
<td>41.4</td>
</tr>
<tr>
<td>Deference</td>
<td>40.7</td>
</tr>
<tr>
<td>Succorance</td>
<td>40.4</td>
</tr>
<tr>
<td>Endurance</td>
<td>35.9</td>
</tr>
<tr>
<td>Abasement</td>
<td>35.8</td>
</tr>
<tr>
<td>Order</td>
<td>35.5</td>
</tr>
</tbody>
</table>

An examination of these data revealed that only one factor was significantly greater than all of the others, that one factor being dominance. However, using an average percentile rank of 50 or greater as a point of reference, the subjects were found to be "high" in their need-dispositions for the following: (1) dominance, (2) exhibition, (3) achievement, (4) affiliation, (5) heterosexuality, (6) intraception, (7) autonomy, (8) aggressiveness, and (9) change. Nurturance, deference, succorance, endurance, abasement, and order were the factors for which the subjects had "low" need-dispositions. These findings were in direct
contrast to those reported by Lipham (56) and cited previously in this study.

B. Results of the Simulation

When success was defined as an exact match between the observed and predicted decisions, the simulation program resulted in three successes for subject number three. When success was defined as a difference of 50 or less between the predicted and observed decision, two additional successes were observed. In those instances in which success was not observed under either definition, the predicted decision tended to be more idiographic than the observed decision. There was no consistent similarity between either those problems for which successes were recorded or those problems for which no successes were recorded for subject number three. This subject was highest in his need-disposition for affiliation, dominance, and change. He was lowest in his need-disposition for abasement, deference, and endurance.

Three exact matches and three decisions which were within 50 of the observed decision were observed for subject number eight. In two of the instances in which success was not observed for either definition, the predicted decision was more nomothetic than the observed decision. In the remaining case, the predicted decision was more idiographic than the observed decision. Both of the problems for which the predicted decision was more nomothetic than the observed decision were problems involving discipline. A community relations situation was involved in the problem for which the predicted decision was more idiographic than the observed.
No similarities of significance were noted among the problems for which successful predictions had been recorded. Subject number eight was highest in his need-disposition for achievement, dominance, and intraception. His need-disposition was lowest for deference, succorance, and abasement.

For subject number 15, exact matches were obtained on six of the problems, and a difference equal to or less than the absolute value of 50 was observed once. For the two problems for which no successes were recorded, the predicted and observed decisions were at opposite extremes, the observed being highly idiographic in both cases and the predicted being highly nomothetic. One of these problems was a personnel problem, and the other was a problem involving board policy and community relations. This subject was highest in his need-disposition for endurance, affiliation, and autonomy. He was lowest in his need-disposition for intraception, abasement, and deference.

A difference of less than or equal to the absolute value of 50 was observed for four of the problems, and an exact match for three of the problems, for subject number 18. For those two problems for which success was not observed under either definition, the predicted decision was more nomothetic than the observed. No similarity was noted between these two problems. Dominance, achievement, exhibition, and change were the highest need-dispositions for subject number 18, and intraception, succorance, and endurance were the lowest need-dispositions.

Only one exact match, and two for which the difference between the observed and predicted decisions was less than or equal to the absolute
value of 50, were recorded for subject number 20. Except for one case in which the predicted decision was more idiographic than the observed, all of the problems for which no success was recorded had predicted decisions which were more nomothetic than the observed. No consistent similarities were observed among either the successful or the non-successful simulations. Subject number 20 was highest in his need-disposition for affiliation, heterosexuality, and autonomy. He was lowest in his need-disposition for aggressiveness, order, and change.

In three instances, no success was recorded for subject number 21. In each of these cases the predicted decision was more idiographic than the observed. Two of these problem situations involved discipline, while the remaining one involved a problem of community relations. On all other problems, either an exact match or a difference equal to or less than the absolute value of 50 was observed. Exhibition, aggressiveness, and abasement were the highest need-dispositions for this subject, and endurance, order, and change were the lowest.

A difference greater than the absolute value of 50 was recorded in only one instance for subject number 22. In this one case, the predicted decision was more idiographic than the observed. Exact matches were obtained on three of the remaining eight problems. One of these involved a personnel problem, and the remaining two were concerned with community relations. No consistent similarity was observed between the problems on which the difference between the observed and predicted decision was less than or equal to the absolute value of 50. Subject number 22 was highest in his need-disposition for achievement, intraception, and aggressiveness,
and lowest in his need-disposition for nurturance, abasement, and affiliation.

On five out of the nine problems, two exact matches and three "near misses", success was recorded for subject number 23. In two of the remaining four cases the predicted decision was more idiographic than the observed decision. Both of these situations were concerned with a problem involving personnel administration. On the other two problems, the predicted decision was more nomothetic than the observed decision. There was no significant similarity between these two problems. The need-disposition of subject number 23 was highest in the areas of dominance, affiliation, achievement, and nurturance. His need-disposition was lowest in the areas of order, aggressiveness, and exhibition.

For subject number 24, exact matches were obtained on only two of the nine problems. No similarities between these two problems were noted. On three of the problems the difference between the predicted decision and the observed decision was equal to the absolute value of 50. No similarities were observed among these problems. For the remaining four problems, no successes were recorded. On three of these problems the predicted decision was more nomothetic than the observed decision. On the remaining problem, the predicted decision was more idiographic than the observed decision. Exhibition, change, and endurance were the areas for which subject number 24 had the highest need-disposition, and abasement, succorance, and order were the areas for which he had the lowest need-disposition.

In all instances in which no successes were recorded for subject
number 25, the predicted decision was more nomothetic than the observed decision. Both of the problems on which exact matches were obtained were concerned with problems of personnel administration, while the pair of problems for which the difference between the predicted and observed decision was equal to the absolute value of 50 were concerned with a discipline and a personnel problem respectively. The subject's highest need-dispositions were affiliation, dominance, and exhibition. The subject's lowest need-dispositions were aggressiveness, order, achievement, autonomy, and endurance.

The only successes observed for subject number 26 were exact matches on four of the nine problems. All four of these problems were concerned to some extent with a situation involving community relations. In regard to the five problems for which no successes were observed, on four the predicted decision was more nomothetic than the observed decision. On the remaining problem, the predicted decision was more idiographic than the observed. Subject number 26 had the highest need-disposition for endurance, achievement, and heterosexuality. He had the lowest need-disposition for nurturance, deference, and affiliation.

In every case for which no successes were recorded for subject number 27, the predicted decision was more idiographic than the observed decision. The three problems for which exact matches were observed had no significant similarities. The two problems for which the difference between the predicted and the observed decision was equal to the absolute value of 50 were similar to the extent that they both dealt with problems of personnel administration. The need-disposition of subject number 27 was highest in
the areas of exhibition, aggressiveness, and abasement. His need-disposition was lowest in the areas of endurance, order, and change.

Only one exact match was observed for subject number 28. However, on four of the problems the difference between the predicted and observed decision was equal to the absolute value of 50. No similarities were found, however, among these four problems. For each of the problems on which no successes were observed the predicted decision was more nomothetic than the observed decision. Affiliation, intraception, and autonomy were the highest need-dispositions for subject number 28; endurance, succorance, and nurturance were the lowest.

Counting both types of success, seven of the nine problems resulted in successful predictions for subject number 29. Four of these successes were exact matches and three were the result of a difference equal to the absolute value of 50 between the predicted and observed decisions. There were no similarities between the results; the problems on which some success occurred were not similar, nor were those on which no success occurred. The highest need-dispositions for subject number 29 were exhibition, achievement, and autonomy, while his lowest need-dispositions were deference, abasement, and affiliation.

For subject number 30, five of the problems resulted in predictions which were different from the observed decision by the absolute value of 50. Two problems resulted in an exact match between the predicted and observed decisions. For those two problems for which no successes were observed, the predicted decision was more nomothetic than the observed. Dominance, heterosexuality, and aggressiveness were the highest need-
dispositions for this subject, and endurance, deference, and order were the lowest.

Even though the number of successes (when success was defined as an exact match between the predicted and observed decision) was significantly greater than that which could reasonably be expected by chance, it was not great enough to be of any practical value. However, when success was defined as a difference less than or equal to the absolute value of 50 between the observed and predicted decision, the number of successes indicated that the simulation program might be of some practical value in predicting general inclination towards a particular pattern of decision-making behavior.

For those subjects for whom the simulation program was most successful, subjects number 8, 15, 18, 21, 22, 29, and 30, the highest need-dispositions were achievement, exhibition, dominance, and aggressiveness. For those subjects for which the simulation was least successful, subjects number 20, 25, and 26, the highest need-dispositions were affiliation and heterosexuality. It was interesting to note that in both cases there appeared to be a positive correlation between the factors which made up the high level need-dispositions.

The lowest need-dispositions for those subjects for whom the simulation was most successful were deference, abasement, nurturance, and endurance. Again, a positive correlation between these factors seemed to be apparent. For those subjects for whom the simulation program was the least successful the lowest need-dispositions were order and aggressiveness. The positive correlation that was noted in the other levels of need-dispositions was not apparent in this case.
For those problems for which the simulation was most successful, problems 1, 3, 5, 6, 7, 8, and 9, the most dominant type was a problem involving personnel administration, and the second most dominant type was that problem which involved community relations. There was no apparent similarity between the two problems for which the simulation was least successful.

A possible explanation of the fact that those problems involving personnel administration were the "most predictable" was that most districts and most states have specific policies or laws which govern personnel administration to some extent. Such laws gave the administrator less leeway in his decision, thus such decisions became more predictable.

Considering the results of the simulation in total perspective, it seemed that the specific decisions could not be successfully predicted by the simulation program to any practical degree. General inclinations toward a type of decision, on the other hand, were fairly predictable using this particular simulation model.

Based on these results, it was not possible to make any concrete conclusions regarding the validity of Getzels' and Guba's model. The lack of conclusive findings could be the result of one of two major factors. The first could have been that the model developed by Getzels and Guba was not adequate. The second could be that the operationalization of the model was not adequate. The findings of this study are not sufficient to determine which of these two factors is the correct one.
VII. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

A. Summary

The purposes of this study were:

1. To attempt to ascertain whether or not the model of administrative behavior developed by Getzels and Cuba was capable of being operationalized to the extent that it could be programmed for computer simulation.

2. To attempt to ascertain whether or not the model of administrative behavior developed by Getzels and Cuba was valid in terms of its ability to predict administrative decision-making behavior.

3. To provide information which might be used in identifying types of administrative behavior which in turn might be of value in future theoretical development.

4. To identify some of the personality characteristics and need-dispositions of educational administrators which affect their decision-making behavior in specific decision-making situations.

5. To supply information which might serve as background material for future studies.

Data were obtained from 30 subjects, all of whom were male, and were enrolled in a graduate level course in educational administration at Iowa State University, Ames, Iowa. Two instruments were used to collect the data. One, the Edwards Personal Preference Schedule, was a commercially produced, standardized instrument. The second instrument was a two part questionnaire constructed by the researcher. The first part of this
questionnaire consisted of 13 items which were designed to gather personal information about the subjects. The second part of the questionnaire consisted of nine hypothetical problem situations, each with five alternative solutions. The subject was asked to indicate which of the five alternatives he would choose to solve the problem.

Administrative theory in education was considered from the following vantage points:

1. Historical perspective.
2. Early developments in administrative theory.
3. Theoretical development of administration.

Predicting human behavior was divided into two categories. These were:

1. Predicting general behavior.
2. Predicting decision-making behavior.

Following a review of research in the area of simulation, a detailed explanation of Getzels' and Guba's model of administrative behavior was presented.

The results of the simulation indicated that predicting general or global types of behavior was more successful than predicting specific decision-making behavior. The simulation was most successful for those subjects who had indicated a high need-disposition for achievement, exhibition, dominance, and aggressiveness. These same subjects had indicated a low need-disposition for deference, abasement, nurturance, and endurance. The simulation was least successful for those subjects who had indicated a high need-disposition for affiliation and heterosexuality,
and a low need-disposition for order and aggressiveness. Among those problems for which the simulation was most successful, the most dominant type were those problems involving personnel administration. The second most dominant type were those problems involving community relations.

B. Conclusions

1. General or global tendencies toward a type of behavior were more predictable than specific administrative decision-making behavior. The variables involved in a specific decision are too numerous and diverse to readily submit to any significant degree of mathematical systematization. Those variables involved in general types of decisions or behavior, however, are most constant, less numerous, and less fluid. Thus, they are more capable of being drawn together to form a predictable system of behavior.

2. No definite conclusion regarding the validity of Getzels' and Guba's model, in terms of its ability to predict administrative decision-making behavior, could be made. Either the model or the operationalization of the model was inadequate.

3. The single need-disposition which educational administrators possess to a significant extent in common was dominance. This could be a function of the position, since all subjects were experienced. It is conceivable that this characteristic had been developed over years of administrative experience. However, it is just as conceivable that those persons who have a high need for dominance seek administrative positions in order to provide an opportunity to satisfy this need.
4. The behavior of subjects who had a high need-disposition in the areas of achievement, exhibition, dominance, and aggressiveness, and a low need-disposition in the areas of deference, abasement, nurturance, and endurance was more predictable than the behavior of subjects who had a high need-disposition for affiliation and heterosexuality, and a low need-disposition for order and aggressiveness. It would seem to be a logical conclusion that those subjects whose high need-dispositions were of an assertive nature, as opposed to a passive nature, would be more likely to act openly and strongly to satisfy such needs. Hence their actions would be more predictable than those of persons who demonstrate high need-dispositions of a passive nature.

5. Decisions for all subjects on problems involving personnel administration were more predictable than decisions on problems involving either community relations or student discipline. One possible reason for this would be that personnel policies are usually more explicit than policies governing community relations and student discipline. Thus, the alternatives are not as varied and the decision is more likely to be predetermined by policy, and is therefore more predictable.

6. There was an observable "gap" between administrators and their professional staffs. As each position within the system becomes more specialized in nature, it is logical to expect that the understanding between members of the system would decrease, thus leading to a gap between members at various levels within the organization.
C. Recommendations

1. Recommendations to administrators

   1. Prospective educational administrators should examine their probable decision in administrative problem settings in order to be able to examine the consequences of such decisions.

   2. Prospective educational administrators should be given every opportunity to act in an administrative setting. Such opportunities could come about via an internship, in-basket/out-basket simulation, or computer simulation.

   3. Those involved in the training of prospective educational administrators should be aware of the role of personality in decision-making behavior.

2. Recommendations for further research

   The findings of this study did not determine whether or not a global theory of administration, or even a theory of educational administration, can be found. They simply shed some light on the usefulness of one particular model of administrative behavior. At the same time, they uncovered some areas that merit further investigation.

   1. A study should be made that examines the variance in the predictability of decision-making behavior when such variance is based on variables such as sex, age, experience, educational background, etc.

   2. A study should be made using a regression equation as the predictive device, and the results of such a study should be compared to the present one to determine the merits of simulation as a predictive technique. The regression equation should be first established by using
the results of a questionnaire similar to the one employed in this study. Once the appropriate weights have been determined for the prediction variables, a second set of subjects should be used to test the regression equation against the simulation technique. The success of the regression could be judged by comparing the predicted outcomes with observed outcomes in the same manner that this study employed.

3. A study to examine the effects of simulation oriented training versus lecture oriented training for educational administrators should be made.

4. The present study should be replicated, using different subjects to examine the reliability of this particular simulation program.

5. A simulation study similar to this one should be made, in which a judgment panel is used to scale the alternatives along a continuum from entirely idographic to entirely nomothetic. The results of the judgment panels' scaling could then be used as the weight assigned to each alternative. The simulation technique could then involve a method which converts the observed sum for a subject to a standard score, such a score being based on the mean and standard deviation of the obtained weights from the judgment panel. Such a method could very possibly lead to greater success in the prediction.
VIII. BIBLIOGRAPHY


IX. APPENDIX A
This instrument consists of two parts. The first part contains questions designed to gather personal information that will be used as part of the input data to the computer simulation program. No individual will be identified in the study; the only means of identification will be the number appearing at the top of this page.

The second part of the instrument contains the problem situations to which you shall be asked to respond. Detailed instructions will be given for the completion of this part of the instrument after you have finished the first part.

At this time please answer the questions on the first part of this instrument. When you have finished with the first part, please read carefully the directions for the second part and proceed with it.
Directions:

At this time please check to make sure that the number which appears on the cover of this booklet matches the number which appears on the Edwards Personal Preference Schedule, and that both of these match the number which appears on the answer sheet for the EPPS. If any of these numbers is different from the others, please correct it by making it the same as the number which appears on the cover of this booklet.

If the numbers match, please proceed with the instrument. Answer each of the following questions by placing a check (✓) in the blank immediately preceding the appropriate response. Please check only one response to each question unless instructed to do otherwise.

When you have finished with Part I, please make sure that you have answered all of the questions, and then proceed to Part II.

1. Sex
   ____ Male
   ____ Female

2. Age
   ____ Under 25
   ____ 25-29
   ____ 30-34
   ____ 35-39
   ____ 40-44
   ____ 45-49
   ____ 50-54
   ____ 55-59
   ____ 60-64
   ____ 65 or over

3. Marital status
   ____ Single
   ____ Married
   ____ Divorced
   ____ Widowed
4. What is your present position?
   - Student (full time)
   - Superintendent
   - High School Principal
   - Junior High School Principal
   - Elementary Principal
   - Teacher
   - Assistant Principal (sr. high)
   - Assistant Principal (jr. high)
   - Counselor
   - Department of Public Instruction
   - Other (please specify):

5. Excluding your present position, which of the following positions have you held previously? (check all those that apply)
   - Superintendent
   - High School Principal
   - Junior High School Principal
   - Elementary Principal
   - Assistant Principal (sr. high)
   - Assistant Principal (jr. high)
   - Teacher
   - Counselor
   - Department of Public Instruction
   - Others (please specify):

6. If you are currently in a public school position, how many students are in your school? If you are not in a public school position, mark the response "Does not apply".
   - Less than 100
   - 100-499
   - 500-999
   - 1000-1499
   - 1500-1999
   - 2000 or more
   - Does not apply
7. How many years of administrative experience have you had?
   ___ 1 or less
   ___ 2-4
   ___ 5-9
   ___ 10 or more

8. What is the highest degree which you possess?
   ___ B.A. or B.S.
   ___ M.A. or M.S.
   ___ Specialist (Masters + 45)
   ___ Ph.D.

9. Approximately, how many quarter hours beyond this degree do you have?
   ___ 4 or less
   ___ 5-12
   ___ 13-20
   ___ 21-28
   ___ 29-36
   ___ 37 or more

10. Which of the following statements best describes your plans for the immediate future?
    ___ Remain with my present organization, and in my same position.
    ___ Remain with my present organization, but in a different capacity.
    ___ Return to school.
    ___ Leave my present organization and go to work for another.
    ___ Retire.
11. If you were a superintendent, to which of the following groups do you think that you would feel most responsible? (check only one)

___ The Board of Education
___ Your professional staff
___ Your students
___ The citizens of your district

12. If you were a principal, to which of the following groups do you think that you would feel most responsible? (check only one)

___ Your superintendent
___ The Board of Education
___ Your professional staff
___ Your students
___ The citizens of your district

13. Place a check (✔) before the name of each organization of which you are a member.

___ National Educational Association
___ American Federation of Teachers
___ American Association of School Administrators
___ National Association of Secondary School Principals
___ American Personnel and Guidance Association
___ Others (please specify): __________________________________________

__________________________
Directions:

Each of the following pages contains the description of a problem situation. Following each description is a set of five alternative solutions to the problem. You are to read each problem, paying strict attention to the characteristics of the situation (e.g., size of school, board policies, etc.) and then place a check (✓) in front of the alternative that you would select as the solution to the problem. You must choose from the alternatives listed. If you do not agree with any of them, select the one which you would prefer, even though it does not agree with your personal solution. Please respond to each situation in terms of the characteristics of that situation, rather than according to your present position. Check only one alternative for each problem. This is not a test of skill or knowledge, hence there are no right or wrong answers. Though this is not a time instrument, and you are under no pressure to finish it within a given amount of time, do not spend too much time on any one problem, but respond according to your first inclination.
PROBLEM 1

You are the principal of a large, suburban high school. Although the Board of Education has exclusive power to employ personnel, the Board and the superintendent have delegated to the building principals the power to appoint the department chairmen for their respective buildings.

Two years ago you recruited an experienced language teacher. She was hired by the Board at a top salary. Her acceptance of the position, however, was based on your verbal promise that she would be appointed as chairman of the department as soon as the position was available. Although there was no written agreement, the substance of your promise has become common knowledge among staff and citizens. The department chairmanship is now open, and everyone, including the teacher in question, assumes that you will follow through on your promise. You, on the other hand, have been disappointed in the teacher's leadership qualities. On several occasions she has neglected various responsibilities assigned to her. Meanwhile, a new, inexperienced teacher in the department has demonstrated leadership abilities, and would, in your opinion, make a good department chairman.

Which of the following alternatives would you select as your solution to the problem?

_____ 1. Remain true to your word and appoint the veteran teacher as the chairman of the department.

_____ 2. Appoint the inexperienced teacher as the chairman of the department.

_____ 3. Make the position that of co-chairmen and appoint both of the teachers in question to the new position.

_____ 4. Do not make the appointment immediately, but give the veteran teacher one more opportunity to demonstrate that she is capable of assuming the responsibilities of such a position.

_____ 5. Permit the members of the language department to select their own chairman.
PROBLEM 2

You are the superintendent of a large, suburban school district. At one time, fraternities flourished in your district, but the adoption of a written policy that called for the automatic suspension of known fraternity members seemed to wipe them out. For the past few months you have known that such groups are again in existence, but you have failed to take any action since none of their activities have taken place on school property. Suddenly, however, the issue is thrust upon you when a boy is seriously injured during an initiation ceremony. Although the incident did not take place on school property, several active participants in the incident are student leaders.

Which of the following alternatives would you select as your solution to the problem?

1. Act at once in accordance with the Board policy and immediately suspend all known fraternity members.
2. Take no action; this is a problem for the parents of those involved.
3. Suspend only those members involved in this particular incident.
4. Ask the members of the fraternities to meet with you in private to discuss the incident.
5. Take no immediate action, but inform students that from now on the Board's policy will be strictly enforced.
PROBLEM 3

As the superintendent of a small, rural school district you asked a group of teachers to study the merits of the various programs in modern mathematics. This group consisted of all secondary mathematics teachers and several elementary teachers, with one from each grade level. Although no prior agreement was made, the impression was that the committee's purpose was to recommend a specific program for adoption by the district.

The group has completed its work, after a year of study, and has recommended that the district adopt a specific modern mathematics program. The Board has indicated its willingness to adopt a new program, but will act only upon your recommendation. You have studied the program recommended by the committee and it does not make sense to you. Moreover, the same program was tried in a neighboring district and was abandoned after only one year of operation.

Which of the following alternatives would you select as your solution to the problem?

1. Accept the committee's recommendation.
2. Reject the committee's recommendation.
3. Delay a final decision until the opinion of an outside consultant can be obtained, and the reason for the abandonment of the program by the neighboring district can be ascertained.
4. Recommend to the Board that the program be implemented on a trial basis.
5. Delay a final decision and request the committee to provide further justification for the program.
You are the superintendent of a large, rural school district. Because of the geographic size of your district, you provide transportation for a large percentage of your students. The state law says that all students who live more than 2.5 miles from their school must be provided transportation. Your Board, however, has adopted a written policy that all students who live more than 2 miles from their school qualify for bus transportation.

Many high school students ride the bus one day and drive themselves to school the next. A number of high school parents have become quite irate, claiming that the 2 mile limit is arbitrary and discriminatory. They demand that, since there are always empty seats, their children should be allowed to ride the bus to and from school. Most of these parents live just within the two-mile limit.

Which of the following alternatives would you select as your solution to the problem?

1. Adhere strictly to the Board's policy and refuse the request of the parents.
2. Allow those children concerned to ride the buses only if seats are available.
3. Request your Board to alter the boundaries for bus transportation to coincide with state law.
4. Require those eligible to ride to indicate their intention to do so, and then permit an appropriate number from within the two-mile limit to ride.
5. Ignore the complaints on the grounds that they have no justification.
PROBLEM 5

Your school district has adopted a policy that requires all pupils to be vaccinated before being admitted to school in the fall. State law is mute on this issue. The policy had caused no problems until this year, when a new family claimed that its children were exempt from this requirement on the basis of a religious belief. The family is a member of the Christian Science faith, and your Board granted the exemption.

Now, a number of other parents are demanding that the Board reverse its decision, complaining that the exempted children are no less capable of communicating diseases than are children of other faiths. They demand that these children either be required to submit to vaccination or be expelled from school. As the superintendent, the Board has asked for your opinion.

Which of the following alternatives would you recommend that the Board follow?

1. Reject the demands of the irate parents.
2. Urge the board to reverse its position.
3. Ask the parents of the children in question to reconsider their request for an exemption.
4. Repeal the policy requiring vaccination.
5. Deny the request of the parents for expulsion, but suggest that they might have some recourse through the courts.
PROBLEM 6

You are the superintendent of a large, suburban school district. One of your custodians has reported, to your high school principal, that he has found empty whisky bottles on the school grounds. Although there is no evidence that students are drinking on the school grounds, your principal (unknown to you) issued a stern warning to the student body and stated that any student caught drinking on school property would be expelled summarily. The issue is suddenly thrust into your lap when a senior honor student becomes involved in a pregraduation party, becomes drunk, wanders on to the high school athletic field where he was apprehended by security guards with a bottle in his hand. The high school principal has asked for you to stand behind his warning and recommend to the Board that the boy be expelled.

Which of the following alternatives would you select as your solution to the problem?

___ 1. Stand behind your principal and recommend the student’s expulsion.
___ 2. Turn the matter over to juvenile authorities.
___ 3. Suspend the student and warn the principal against issuing statements which he cannot support.
___ 4. This matter can best be handled by a private conference with the boy and his parents.
___ 5. Take no punitive action against the boy.
PROBLEM 7

You are the superintendent of a small, rural school district. Last year one of your central office administrators, the business manager, reached retirement age. The Board policy regarding retirement states that retirement is mandatory for all district employees at age 65, unless they are retained by special Board action. As its executive officer, the Board directed you to notify the man that his services would not be needed, and further directed you to seek a replacement. The first task you performed verbally, and on your recommendation, the board hired a replacement for the retiring administrator.

You assumed that all was well until the beginning of the new school year. The "former" business manager persists in staying on in his position, and shows up at the office daily. Needless to say, the situation is most untenable. Other circumstances make the problem more complex. The administrator is a former high school principal in the district and enjoys great popularity within the community. In addition, he has indicated that he will resist any effort to force him into retirement.

No paychecks have been issued to the administrator this year, but his attorney is coming to the next Board meeting to demand that he be paid for "services rendered".

Which of the following alternatives would you select as your solution to the problem?

_____ 1. This is a matter for a court to decide.

_____ 2. Pay him for his services to date, but ask that he abide by the Board's decision from now on.

_____ 3. Delay your decision until the board has met with his attorney and had the opportunity to discuss the issue with him and the district's legal representative.

_____ 4. Find a "place" for him within the district.

_____ 5. Make it clear that his services are not needed, and that he will not be paid, but that if he desires he may serve as a volunteer worker and assist in some of the work of the central office.
PROBLEM 8

You are the superintendent of a middle sized school district in the Midwest. Your Board, on your recommendation and the recommendation of the physical education teachers, has just adopted a policy that all girls must wear a standard "uniform" for physical education classes. The policy explicitly describes the acceptable uniform. The standards set by the Board for the uniform are such that a particular store's brand will not meet the standards in terms of type of material, style, tailoring, etc. As a result, this store stands to lose a good share of the market. The owner of the store has come to you asking that the uniforms be let out to the lowest bidder. His contention is that the Board's requirements constitute unfair competition. Board policy requires that all purchases of more than one hundred dollars be let out to bidding.

As the superintendent, which of the following alternatives would you select as your solution to the problem?

____ 1. Reject the store owner's request.
____ 2. Accept his request and submit the uniforms to bids.
____ 3. Make the uniform standards less restrictive.
____ 4. Establish an agreement with all stores involved that will grant to a single store, on an annually rotating basis, the exclusive right of selling the required uniform.
____ 5. Reduce the wording of the policy so that the purchase of a uniform is only recommended and not required.
PROBLEM 9

You are the superintendent of a small, rural school district. During the first week in August, about a month before the beginning of school, your senior high physics teacher asks to be released from his contract. He has been offered a graduate fellowship to pursue his masters, and would like very much to accept the offer. He is an excellent teacher.

Which of the following alternatives would you select as your solution to the problem?

1. Release him from his contract.
2. Hold him to his contract.
3. Release him from his contract only if you can find a replacement.
4. Grant him a sabbatical leave, with the understanding that he will return after the completion of his graduate program.
5. Release him at the end of the first semester.
X. APPENDIX B
INTEGER SUM, AGE, EXP, RESP, SUMSTR, DIFF
INTEGER PROB(9,10), SUB(30,52), COEF(15)
COMMON PROB
INTEGER ALT1, ALT2, ALT3, ALT4, ALT5
DO 10 I = 1,9
READ(1,5) (PROB(I,J),J=1,10)
5 FORMAT(1014)
10 CONTINUE
READ(1,15) NN
15 FORMAT (I2)
DO 25 I = 1,NN
READ(1,20) (SUBJ(I,J),J=1,52)
20 FORMAT(I2,3I1,I2,23I1,15I2,9I1)
25 CONTINUE
READ(1,30) (COEF(I),I=1,15)
30 FORMAT(15I2)
TOTAL = 0.0
SUCC = 0.0
DO 235 I = 1,NN
SUM = 0.0
K = 1
DO 45 J = 29,43
IF(SUBJ(I,J)-50)40,35,35
35 SUM = SUM + COEF(K)*SUBJ(I,J)
40 K = K + 1
45 CONTINUE

WRITE(3,50) SUM, SUBJ(I,1)

50 FORMAT('SUM OVER EDWARDS =',2X,I4,2X,'FOR SUBJECT NO.',2X)

IF(SUBJ(I,3))60,55,60

55 AGE = SUBJ(I,3) + 10
   GO TO 65

60 AGE = SUBJ(I,3)*10 + 10

65 SUM = SUM + AGE
   IF(SUBJ(I,17))75,70,75

70 EXP = SUBJ(I,17) + 10
   GO TO 80

75 EXP = 30*SUBJ(I,17) + 10

80 SUM = SUM + EXP
   IF(SUBJ(I,21))90,85,90

85 RESP = SUBJ(I,21) - 100
   GO TO 105

90 IF(SUBJ(I,21)-2)95,95,100

95 RESP = SUBJ(I,21)*25
   GO TO 105

100 RESP = SUBJ(I,21)*33 + 1

105 IF(SUBJ(I,22)-1)115,115,110

110 RESP = RESP + 25*SUBJ(I,22)
   GO TO 120
115 RESP = RESP - 100
120 SUM = SUM + RESP/2
   IF(SUBJ(I,16)>130,125,130
125 SUM = SUM + 100
   GO TO 185
130 IF(SUBJ(I,16)-1)>140,135,140
135 SUM = SUM + 50*SUBJ(I,16)
   TO TO 185
140 IF(SUBJ(I,16)-2)>150,145,150
145 SUM = SUM + 12*SUBJ(I,16) + 1
   GO TO 185
150 IF(SUBJ(I,16)-3)>160,155,160
155 SUM = SUM - 8*SUBJ(I,16) - 1
   GO TO 185
160 IF(SUBJ(I,16)-4)>170,165,170
165 SUM = SUM - 12*SUBJ(I,16) - 2
   GO TO 185
170 IF(SUBJ(I,16)-5)>180,175,180
175 SUM = SUM - 20*SUBJ(I,16)
   GO TO 185
180 SUM = SUM + SUBJ(I,16) - 6
185 SUMSTR = SUM
   SUMSTR = SUMSTR - 400
   WRITE(3,190) SUMSTR
190 FORMAT(' ',5X,'SUM OVER ALL FACTORS =',2X,I4)
DIFF = 0
DO 235 J = 1,9
SUM = SUMSTR + PROB(J,1)
DO 195 K = 2.5
195 SUM = SUM + PROB(J,K)
NUM = 0
M = 43 + J
N = SUBJ(I,M) + 1
LL = 0
K = 0
CALL PREDIC(SUM,I,J,NUM,DIFFF,N,K,LL)
IF(J-1)215,200,215
200 WRITE(3,205)
205 FORMAT(' ',5X,'SUBJECT NO.',5X,'PROBLEM NO.',5X,'SUM',5X,'OBSERVED
1',5X,'RATING',5X,'PREDICTED',5X,'RATING',5X,'DIFFERENCE'///)
WRITE(3,210) SUBJ(I,1),J,SUM,N,PROB(J,K),NUM,PROB(J,LL),DIFF
210 FORMAT('',7X,I2,15X,I1,11X,I4,8X,I1,10X,I4,10X,I4,9X,I4)
GO TO 225
215 WRITE(3,220) J,SUM,N,PROB(J,K),NUM,PROB(J,LL),DIFF
220 FORMAT(' ',24X,I1,11X,I4,8X,I1,10X,I4,10X,I1,10X,I4,9X,I4)
225 TOTAL = TOTAL + 1.0
IF(NUM-N)235,230,235
230 SUCC = SUCC + 1.0
235 CONTINUE
PERCNT = (SUCC/TOTAL)*100.0
WRITE(3,240)
240 FORMAT('1',5X,'TOTAL',5X,'SUCCESSES',5X,'PERCENT CORRECT'//)
WRITE(3,245) TOTAL, SUCC, PERCNT
245 FORMAT(' ',6X,F5.1,8X,F4.1,12X,F5.2/////)
WRITE(3,250)
250 FORMAT(' ',5X,'PROBLEM NO.',5X,'ALT-1',5X,'ALT-2',5X,'ALT-3',5X,'ALT-4',5X,'ALT-5'//)
DO 305 I = 44,52
K = I - 43
ALT1 = 0
ALT2 = 0
ALT3 = 0
ALT4 = 0
ALT5 = 0
DO 295 J = 1,NN
IF(SUBJ(J,I))260,255,260
255 ALT1 = ALT1 + 1
GO TO 295
260 IF(SUBJ(J,I)-1)270,265,270
265 ALT2 = ALT2 + 1
GO TO 295
270 IF(SUBJ(J,I)-2)280,275,280
275 ALT3 = ALT3 + 1
GO TO 295
280 IF(SUBJ(J,I)-3)290,285,290
285 ALT4 = ALT4 + 1

GO TO 295

290 ALT5 = ALT5 + 1

295 CONTINUE

WRITE(3,300) K, ALT1, ALT2, ALT3, ALT4, ALT5

300 FORMAT('',10X,I1,11X,I2,8X,I2,8X,I2,8X,I2,8X,I2)

305 CONTINUE

WRITE(3,320)

320 FORMAT('SUBJECT NO.',5X,'PROB-1',5X,'PROB-2',5X,'PROB-3',5X,'PROB-4',5X,'PROB-5',5X,'PROB-6',5X,'PROB-7',5X,'PROB-8',5X,'PROB
2-9')

DO 330 I = 1,NN

WRITE(3,325) SUBJ(I,1),(IDIFF(I,J),J=1,9)

325 FORMAT('',9X,I2,10X,I4,8I11)

330 CONTINUE

STOP
SUBROUTINE PREDIC(SUM,I,J,NUM,DIFF,N,K,LL)

INTEGER COMP, SUM, DIFF
COMMON PROB(9,10)
INTEGER PROB
COMMON IDIFF915,9)

IF(J-1)302,301,302

301 SUM = SUM + 53
GO TO 319

IF(J-2)304,303,304

303 SUM = SUM + 80
GO TO 319

IF(J-3)307,306,307

306 SUM = SUM - 151
GO TO 322

IF(J-4)309m308,309

308 SUM = SUM + 138
GO TO 319

IF(J-5)312,311,312

311 SUM = SUM + 65
GO TO 319

IF(J-6)314,313,314

313 SUM = SUM - 98
GO TO 319

IF(J-7)317,316,317

316 SUM = SUM - 35
K = N + 5
NUM = 3
LL = NUM + 5
DIFF = PROB(J,K) - PROB(J,LL)
IDIFF(I,J) = PROB(J,K) - SUM
GO TO 335

IF(J-8)321,318,321

SUM = SUM + 253
GO TO 319

SUM = SUM + 159

MIN = IABS(SUM-PROB(J,6))
NUM = 1
K = N + 5
LL = 6
IDIFF(I,J) = PROB(J,K) - SUM
DIFF = PROB(J,K) - PROB(J,6)
DO 315L = 7,10
COMP = IABS(SUM-PROB(J,L))
IF(COMP-MIN)310,315,315

MIN = COMP
NUM = L - 5
LL = L
DIFF = PROB(J,K) - PROB(J,L)

CONTINUE
335 RETURN
END
/DATA
XI. APPENDIX C
The following are the weights which were assigned to the variables in the nine hypothetical problems, as well as the weights which were assigned to the five alternatives for each problem.

<table>
<thead>
<tr>
<th>Problem 1</th>
<th>Weight</th>
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<tbody>
<tr>
<td>I. Variables</td>
<td></td>
</tr>
<tr>
<td>1. size</td>
<td>-100</td>
</tr>
<tr>
<td>2. role</td>
<td>0</td>
</tr>
<tr>
<td>3. board policy</td>
<td>0</td>
</tr>
<tr>
<td>4. state law</td>
<td>0</td>
</tr>
<tr>
<td>5. public opinion</td>
<td>+100</td>
</tr>
<tr>
<td>II. Alternatives</td>
<td></td>
</tr>
<tr>
<td>1.</td>
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</tr>
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<table>
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<tr>
<td>2. role</td>
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<tr>
<td>3. board policy</td>
<td>-100</td>
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<td>II. Alternatives</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>-100</td>
</tr>
<tr>
<td>2.</td>
<td>+100</td>
</tr>
<tr>
<td>3.</td>
<td>-50</td>
</tr>
<tr>
<td>4.</td>
<td>+50</td>
</tr>
<tr>
<td>5.</td>
<td>0</td>
</tr>
</tbody>
</table>
### Problem 3

**I. Variables**
1. size: +100
2. role: 0
3. board policy: 0
4. state law: 0
5. public opinion: +100

**II. Alternatives**
1. -100
2. +100
3. +50
4. -50
5. 0

---

### Problem 4

**I. Variables**
1. size: -100
2. role: -100
3. board policy: -100
4. state law: 0
5. public opinion: +100

**II. Alternatives**
1. -100
2. +100
3. 0
4. +50
5. -50

---

### Problem 5

**I. Variables**
1. size: 0
2. role: 0
3. board policy: -100
4. state law: 0
5. public opinion: +100

**II. Alternatives**
1. -100
2. +100
3. +50
4. -50
5. 0
Problem 6

I. Variables
1. size -100
2. role 0
3. board policy 0
4. state law 0
5. public opinion +100

II. Alternatives
1. -100
2. 0
3. -50
4. +50
5. +100

Problem 7

I. Variables
1. size +100
2. role 0
3. board policy -100
4. state law 0
5. public opinion +100

II. Alternatives
1. -100
2. -50
3. 0
4. +100
5. +50

Problem 8

I. Variables
1. size 0
2. role 0
3. board policy -100
4. state law 0
5. public opinion 0

II. Alternatives
1. -100
2. +100
3. +50
4. 0
5. -50
Problem 9

I. Variables

1. size  +100
2. role   -100
3. board policy -100
4. state law  0
5. public opinion 0

II. Alternatives

1. +100
2. -100
3. +50
4. -50
5. 0

The following are the factors on the Edwards Personal Preference schedule and the coefficients which were used to weight each in the computer model.

1. Achievement  +1
2. Deference   +1
3. Order       -1
4. Exhibition  +1
5. Autonomy    +1
6. Affiliation -1
7. Intrception +1
8. Succorance  +1
9. Dominance  -1
10. Abasement -1
11. Nurturance +1
12. Change     +1
13. Endurance  -1
14. Heterosexuality +1
15. Aggressiveness +1