KEY INFLUENCES ON MANAGERIAL PERCEPTION OF ORGANIZATIONAL EFFECTIVENESS

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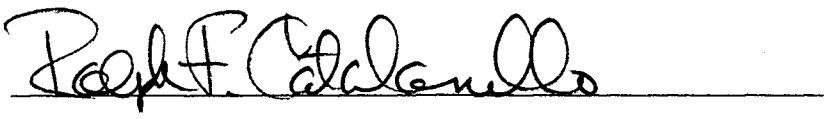
pe and Method of Study: This study, conducted at NASA's Johnson Space Center (NASA-JSC) in Houston, Texas, had a twofold purpose. The first was to determine if a relationship exists between: (1) a manager's perception of an effective organization and (2) his personal background, characteristics of his job and organization, the technology in which he works, and/or his leadership style. The second purpose was to determine whether this relationship is different for those managers who perceive their own organization to be effective as compared with those managers who perceive their own organization to be less effective. Data was gathered via a four-part questionnaire administered to JSC personnel: the data was then subjected to stepwise regression analysis.

idings and Conclusions: There were two main findings resulting from this study. The first is that personal, job, organization, technology, and leadership style variables all influence a manager's perception of an effectiv organization, with his leadership style and organization playing the largest roles. The second finding is that perception of an effective organization is strongly related to: (1) the leadership style of all managers and (2) the personal background, job characteristics, organization, and job technology of only those managers who perceive their own organization to be effective. An important conclusion is that careful consideration of these findings will better enable a manager to understand organizational effectiveness as it is perceived by himself, his superiors, his subordinates, and by external members of his environment. Such an awareness should enhance the manager's ability to contribute to the effectiveness of his organization.

/ISER'S APPROVAL 

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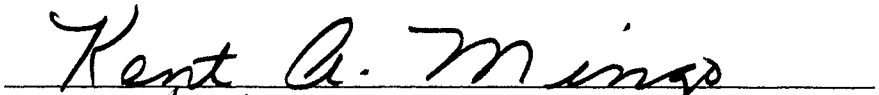

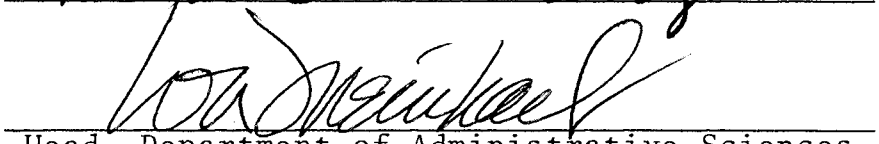

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CHAPTER I

INTRODUCTION

Background and Purpose of the Study

Perhaps the most important ongoing aim of an organi-
ion is to be effective. Once it has established a set
goals to be reached, an organization naturally wants to
isfy these goals in an optimal manner so that resources
ht be conserved while accomplishing objectives. However,
iving at a satisfactory measure of organizational effec-
eness is not an easy matter. While it is universally
arded as being a desirable quality, probably few would
ee on just what effectiveness entails. For this reason,
is clear that any measure of such a quality must certainly
subjective; rather than actually measuring organizational
ectiveness, we will truly measure it only as it is per-
ved by various people.

Aside from the task of quantifying organizational effec-
eness is the problem of determining the particular
ponents of a person's environment which most influence
standards by which he judges the effectiveness of an
anization. Does the technology of a person's job, for
mple, influence (perhaps unconsciously) his development

such a set of standards? What about his leadership
le? How about his personal background? Are there
er factors related to his perception of organizational
ectiveness?

Effectiveness has always been a quality of utmost
ortance to the National Aeronautics and Space Admini-
ation. Prior to and especially since the spectacularly
cessful fulfillment of President Kennedy's announced
l of landing an American on the moon in the decade of
1960's, NASA's accomplishments have been subjected to
se scrutiny. With the attainment of its original over-
ing goal, NASA has found it increasingly necessary to
vince such forces of the external environment as Congress
the public of the continuing benefits to be derived from
space program. In other words, space now has to "pay
own way."

Skylab and Space Shuttle are excellent examples of
grams designed to provide eventually tangible benefits
nan (as well as some very significant immediate benefits).
nical personnel involved in these programs have the
ortunity to join engineers concerned with the current
ergy crisis" as recipients of a new resurgence of public
ognition of the value of the physical sciences. Retention
Congressional funding and public support thus depends to a
ge degree upon the ability of NASA to illustrate its
ectiveness in serving man.

An effective organization is comprised of individuals, ch working toward his own version of "effectiveness." llins (1973) determined several factors (a series of dia- trically-opposed phrases) which people deem most relevant describing the perceived difference between effective and effective organizations.

The purpose of the present study is twofold. First, ta gathered on managers employed at NASA's Johnson Space nter in Houston, Texas, will be analyzed to determine if relationship exists between: (1) a manager's perception an unspecified but effective organization (using Collins' ctors) and (2) his personal background, characteristics of s job and organization, the technology in which he works, d/or his leadership style.

Then this data will be analyzed to resolve whether this lationship is different for those perceiving their own ganization to be effective as compared with those feeling eir own organization to be ineffective. In other words will be determined, for example, whether a manager's per- ption of the effectiveness of his own organization affects e relationship between his perception of an unspecified t effective organization and his personal background (or e relationship between his perception of an unspecified t effective organization and the technology in which he rks, and so on).

Reddin (1970) advanced the notion that the leadership yle which a manager should use depends upon the situation

which he works. In other words, the five situational ements of technology, organizational philosophy, superiors, -workers, and subordinates should be viewed by the mana- r as determinants of the degree to which he should be sk-oriented and the degree to which he should be relations- iented. To determine leadership style for this study, use ll be made of an instrument developed by Reddin. A tool r measuring how a person describes the technology in which works will be developed. Both involve several pairs of atements, and one choice is selected from each pair. Sig- ficant factors from Collins' work will also be a part of e questionnaire. Finally, a few questions designed to scribe characteristics of a manager's job and professional ckground will be involved.

Statement of Hypotheses

In keeping with the twofold purpose of this study, two ve-part hypotheses must be tested.

pothesis #1

A manager's perception of an unspecified but effective ganization is <u>not</u> related to:

(1) his personal background,
(2) characteristics of his job,
(3) characteristics of his organization,
(4) the technology of the work in which he is engaged, and/or
(5) his leadership style.

othesis #2

A manager's perception of the effectiveness of his organization has no effect on the relationship (if a ationship does indeed exist) between his perception of unspecified but effective organization and:

(1) his personal background,
(2) characteristics of his job,
(3) characteristics of his organization,
(4) the technology of the work in which he is engaged, and/or
(5) his leadership style.

A determination of whether or not these two broad otheses are correct will be the goal of this study and important for three main reasons. First, an awareness the forces shaping a manager's opinion will better en- e him to keep any one force from overwhelming the others realistically setting effectiveness standards for his ticular situation. Second, a manager should realize the ent to which his superiors and his subordinates are in- enced by the five classes of variables in forming their ception of organizational effectiveness; he should ognize that their perceptions may be different from own and he should act accordingly. Finally, it is en important for an organization to project an aura of ectiveness to forces of its external environment if it to remain successful in the future.

Pertinent Definitions

An understanding of a few important terms and concepts necessary before proceeding further in this study.

An organization is a group of people working together achieve a common goal or objective.

Organizational effectiveness is a subjective measure how well objectives of the organization are accomplished. ferent people set different standards and thus perceive anizational effectiveness differently.

Technology is defined as the mechanisms or processes which work may be done.

A manager's "perception of an organization" will be ined as the degree to which he feels a certain group of ectiveness traits is typical of, or important to, that anization. It will be abbreviated "EALL".

A manager's perception of an "unspecified but effective anization" will refer to his perception of the most ective JSC division with which he is familiar (the ual division he has in mind will not be named).

A manager's "own organization" will refer to his NASA-JSC ision.

The term "manager" is used loosely and refers to those sons participating as subjects in this study. While some ticipants did not have any subordinates, it is quite sible they managed contracts (contract monitors) or con- ered themselves managers in some other way since only agers were invited to participate.

Preview of the Organization of the Study

A three-part review of the literature will be conducted Chapter II. Research in the areas of organizational ef-ctiveness, technology, and leadership styles will all be amined to provide a valid starting point for the present udy.

Chapter III is concerned with the research method and gins with a discussion of the sample and the procedure. l parts of the questionnaire are explained in detail, from e section designed to measure the dependent variable or-nizational effectiveness to the three sections assessing rsonal background, job characteristics, and organizational aracteristics; job technology; and leadership style. Then e factor analysis and stepwise regression analysis proce-res are explained.

A discussion of concepts and a presentation and dis-ssion of the findings as they relate to both hypotheses e given in Chapter IV.

Finally, the overall implications for management and e conclusions of this study are found in Chapter V.

Summary

The significance of this study has been expressed in rms of the contemporary environment confronting organi-tions in general and NASA-JSC in particular. The purpose this study, a statement of the hypotheses, and relevant

finitions have all been presented, followed by a preview
the organization of this study.

CHAPTER II

REVIEW OF THE LITERATURE

Extensive research has been conducted in the areas of anizational effectiveness, technology, and leadership les. An overview of some of the significant develop- ts will be presented for each of these areas in turn, er which selected theories will be applied to the specific blems posed in this study.

Studies of Organizational Effectiveness

Assessment of organizational effectiveness via an in- ument utilized by Robert W. Collins (1973) is essential the present study. Collins' questionnaire is supported his substantial review of the literature which covered anizational effectiveness (both normative and empirical dies) as well as leadership effectiveness. He determined t the following are five key elements of an organization:

(1) executive management (top management);
(2) supervisory management (front line managers);
(3) organizational information transfer (people-to-people exchange);
(4) flexibility (adaptation to change); and
(5) operations (the use of budget and people resources).

se served as the basis of his work.

Collins noted a point which is also pertinent to this ıdy. He stated:

> "The use of questionnaires is overwhelmingly endorsed as can be seen by the use of them by nine of the twelve empirical studies on organizational effectiveness. All twelve studies utilized some mathematical routine to manipulate the data." (1973, page 21).

ıuestionnaire, factor analysis, and stepwise multiple ;ression analysis will each play an integral role in the ısent study. Collins' questionnaire is discussed in more ıth in the following chapter.

Studies of Technology

Technology has emerged as a significant, perhaps de- ıing, characteristic of organizations in recent years. An ·rview of some pertinent studies in this field will be ·en including:

(1) general theoretical statements,
(2) the role of technology in work groups,
(3) technology in studies of single types of organizations,
(4) technological variables in explicit contrasts of organizations,
(5) technology as an independent variable in comparative studies of organizations, and
(6) classification of technology.

foundation will be developed for a classification of hnology according to demands made on managerial behavior.

eral Theoretical Statements

Theoretical statements relating technology and organi- ional structure have been presented which feature such ngs as a distinction between uniform and nonuniform

ks (Litwak, 1961, with empirical support by Hall, 1962)
a distinction between programmed and nonprogrammed
isions (March and Simon, 1958, and Simon, 1960).

Thompson (1967) developed a classification consisting
three varieties of technology: (1) long-linked or seri-
y interdependent (such as a mass production assembly
e), (2) mediating (operates in standardized ways and
ts inputs or clients into groups for application of
se standardized procedures within groups, as does a
mercial bank), and (3) intensive or custom technology
stomized application of a variety of techniques to an
ect where the selection, combination, and application
techniques is determined through feedback from the ob-
t, as in research).

These theories describe the difference between task
ented (uniform tasks, programmed decisions, and long-
ked) technologies and relations oriented (nonuniform
ks, nonprogrammed decisions, and custom) technologies.
different technologies create different organizational
uctures and different criteria of effectiveness.

Role of Technology in Work Groups

Trist and Bamforth (1951) imposed an assembly-line
utine) work layout on an essentially nonroutine craft
job-shop operation (the long-wall method of coaling)
h predictably unfortunate results.

Likert, a human relations advocate, observed that the sequences of leadership style varied with the routine and routine nature of the work (technology as an independent iable; chapter 7, 1961) and thereby undermined many of central hypotheses of other chapters.

Blauner (1964) used a comparative framework in pre- ting a sophisticated statement of the impact of technology n workers. He studied job satisfaction by occupational upings and found that McGregor's Theory X (1960) works t in unskilled and semiskilled occupations (where the job elf does not offer intrinsic job satisfaction) while regor's Theory Y was found to be more effective for such ple as mathematicians, physicists, doctors, lawyers, or fessors (where the job does offer intrinsic satisfaction).

The point made in each of these studies is that con- eration of the technology is important in achieving effec- eness. It is necessary to consider both the degree to ch the technology is task oriented (routine work and ory X) and the degree to which it is relations oriented nroutine work and Theory Y).

hnology in Studies of Single Types of Organizations

Technology plays an explicit and important role in er's contrast of two units in a long-term hospital (1963). hnology plays the key role in an analysis of the litera- e on general and mental hospitals by Perrow (1965).

The study by Street, et al., of six correctional titutions placed emphasis upon executive goals and avior, thus obscuring the ambiguous but certainly sig- icant role played by technology (1966).

These studies illustrate that organizations with ilar technologies might differ in effectiveness according the different ways in which management perceives and ks with each technology. An organization with an obvious ations orientation will not be as effective if management empts to utilize task oriented methods, for example.

hnological Variables in Explicit Contrasts of Organizations

An ambitious analysis of simple organizations in nonin- trial societies, conducted by Udy (1959), placed explicit hasis upon technology; it is difficult to apply his theory complex organizations in industrialized societies, though.

Technology is a relevant variable both in Stinchcombe's cussion of structure and time periods (1965) and in his cussion of craft and bureaucratic organization (1959).

In both a study of two business concerns by Dill (1958) a comparison of two industrial firms by Lorsch (1965), nology is an important variable but absorbed in the ader variable, environment.

In these studies, an awareness of the particular tech- ogies characteristic of various firms is shown to be ortant; two firms can be equally effective as long as ferences in technology are recognized.

:hnology as an Independent Variable in Comparative Studies Industrial Organizations

Joan Woodward (1965) systematically explored the rela-)nships between organizational technology and variations organizational structure. She performed an analysis of) manufacturing firms in the South East Essex area of ;land and grouped these firms along a scale of technical nplexity (the extent to which the production process is ntrollable and its results predictable). She character-:d three basic modes of production; in order of ascending :hnical complexity these are: (1) unit or small batch)duction (a custom-made suit), (2) large batch or mass)duction (the automobile industry), and (3) continuous)w or process production (oil refineries). An investi-:ion of organizational characteristics led Woodward to : following conclusions: (1) there is no significant re-:ionship between technological mode and organizational :e; (2) the number of levels of authority in an organization :reased with increasing technical complexity; and (3) the :io of managers and supervisors to total personnel increased :h technical complexity. Woodward also incorporated Burns')61) distinction of "organic" (similar to human relations) l "mechanistic" (similar to task) management systems in her :earch and found that firms in the middle of the scale of :hnical complexity were least likely to be characterized by ;anic systems.

Hickson, et al., (1969) proposed a comprehensive contualization encompassing three types of technology; (1) rations (automation of equipment, sequence of operations, specificity of evaluation), (2) materials (nature of the erials and the degree to which the materials are processed n acquired and further processed to be sold), and (3) wledge (complexity of the technology and the degree to ch knowledge of the overall job must be dispersed among subordinates).

Harvey (1967) collected data on 43 industrial organiions and found relationships between an organization's hnology and such aspects of its internal structure as: the number of specialized sub-units, (2) the number of els of authority, (3) the ratio of managers and supervis to total personnel, and (4) the degree of program cification within the organization. He also found that less changeful an organization's technology, the more ely the above aspects of internal structure are to inase. The technological factor, Harvey concluded, is one the most important factors to consider when examining iations in organizational structure.

Mahoney and Frost (1972) applied Thompson's typology technologies (long-linked, mediating, and intensive; 1967) a sample of 297 organizational units within a diverse sam- of 17 business and industrial firms. Their findings port the hypothesis that the criteria of effectiveness of

organizational unit vary with the nature of the tech-
ogy of that unit.

Analyses by Mahoney and Weitzel (1969) indicate that,
ause of differences in their technological environments,
ferent models of organizational effectiveness are applied
managers of research and development units in contrast to
agers of more general business operations.

These studies classify organizations according to their
hnologies. They relate technology to several different
ects of organizations (such as the number of levels of
hority) as well as to the criteria of organizational ef-
tiveness which are utilized. It was shown that different
els of effectiveness must be applied according to the
k or relationships orientation of the situation.

ssification of Technology

Perrow (1967) suggested a system of classification of
anizations which conceptualized organizations in terms of
work they do rather than their structure or their goals.
work done on raw materials Perrow labeled "technology";
raw material may be a symbol, a living being, or an in-
mate object. For example, symbols are materials in some
earch organizations while the interaction of people are
materials to be manipulated by administrators in organi-
ions.

According to Perrow, two aspects of technology vary inde-
dently: the number of exceptions that must be handled and

degree to which search is an analyzable procedure. A task
many exceptions and/or search activities which are not
cal and analytic describes a nonroutine technology. Few
ptions and analyzable search procedures describes a routine
nology. Craft and engineering technologies result from
r combinations; see Figure 1. Finally, task structures
with the technology while social structure is in turn re-
d to technology and task structure.

Although most technology classification schemes have focus
he demands work makes on worker behavior, Reddin's (1970)
Theory" examines technological demands on managerial behav
making it directly useful to the manager as a guide for hi
in suggests that effective management in large measure depe
the manager's ability to determine the proper combination
and relationships orientation dictated by his technology a
his ability and willingness to use the appropriate mana-
al style. A further discussion of Reddin's ideas is presen
he next chapter.

ary of Studies of Technology

A review of the literature on technology reveals a wide
ety of diverging theories, ideas, and concepts. Woodward
5) showed technology and organizational structure to be
ted, as did Harvey (1967). Thompson (1967) developed a
sification of technologies according to the production
ods utilized. Perrow's (1967) classification or organi-
ons was based on technology rather than structure or goals.

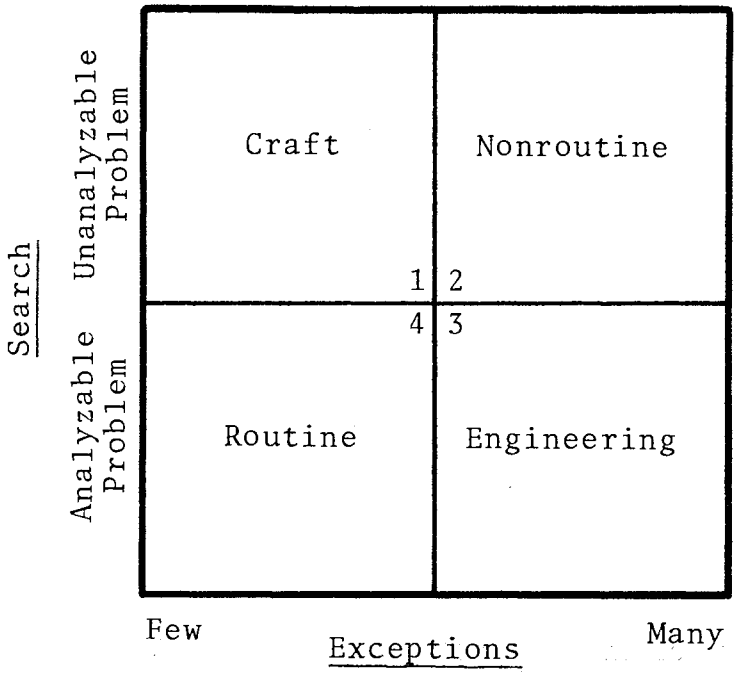

Figure 1. Perrow's Technology Variable

One purpose of the present study is to explore the ationship between technology and a manager's perception organizational effectiveness. Mahoney and Frost (1972) onstrated that the criteria of effectiveness of an organi-ional unit vary with the nature of the technology of t unit. Mahoney and Weitzel (1969) had indicated earlier t differences in technology create a need for different els of organizational effectiveness. Likert (1961) ob-ved that technology influences the consequences of dership style, while Reddin was concerned with technolo-al demands on managerial behavior.

Quantitative methods will be used to determine the re-ionship between technology and a manager's perception of anizational effectiveness. Both of these variables will determined when a manager completes an especially-designed stionnaire. A regression analysis will then indicate the engths of the relationship.

Studies of Leadership Styles

Many behavioral theories have been proposed regarding agerial effectiveness and management styles. The emphasis been placed at various times upon the technology of the , the manager, his subordinates, his co-workers, and the anization itself. This discussion will focus upon the lowing topics:

(1) five schools of thought;
(2) leadership research: basic styles;
(3) leadership effectiveness research: ideal styles;

(4) behavioral theories;
(5) Reddin's managerial effectiveness theory; and
(6) a leadership style concepts comparison.

ɜ Schools of Thought

Reddin (1970) outlines five situational elements that the bases of distinct schools of thought in management ɜloped over the past fifty years: (1) scientific manage-ɜ, (2) human relations, (3) group dynamics, (4) management ɭes, and (5) organization theory. Table I illustrates ɜral categories and indicates when each school became the ɹs of theoretical development and management interest; all still popular today.

TABLE I

MANAGEMENT SCHOOLS OF THOUGHT

ɱPHASIS	INTERFACE	SCHOOL	PERIO
ɹnology	Work-worker	Scientific management	1920
ɔrdinates	Worker-climate	Human relations	1930
Vorkers	Manager-group	Group dynamics	1940
ɜrior	Manager-subordinate	Management styles	1950
ɹnization	Manager-organization	Organization theory	1960

Scientific Management. This functional school of
igement was popularized by Fayol (1930) and by Frederick
;low Taylor (1911). Their approach, more physiological
ı psychological, stressed the training of workers to move
ın optimum speed and in the best way to fit the job.

Human Relations. Elton Mayo (1933,1945) of the Harvard
.ness School and Fritz Roethlisberger (1939) were founders
:his school of management, which emphasized the psycholo-
ıl and sociological forces in industrial organizations
ıer than the worker's physical efforts. It was found that
ıut could be restricted by informal group social pressures
:onform to standards set by co-workers, and that produc-
.ty was affected by the worker's perceptions of the interest
.gement had in him. Morale and job satisfaction were of
.t concern.

Group Dynamics. With this school began interest in the
:raction among people; one of its precepts was that the
:r differential between superiors and subordinates should
.owered. Proponents of this school are Lewin (1948) and
.ford (1961).

Management Styles. McGregor (1960) and Blake (1964)
advocates of this school; style classification schemes
developed which focus on such variables as task and re-
onships rather than on situational variables like technolog
different theories usually outline a so-called "ideal"
e.

Organization Theory. This school of thought views organi ions as entities with life and culture of their own. More hasis is placed on the culture, philosophy, ethics, and mate of the organization than on the technology and persona tors. This approach is well represented by Ackoff (1960). mpson (1967) outlined two strategies for studying organiza- ns: the closed-system approach seeks certainty and uses y those variables positively associated with goal achieve- t while the open-system approach incorporates uncertainty recognizing organizational interdependence with the environ t. He suggested an open-system conceptualization subject t sed-system criteria of goal achievement to be a desirable promise.

dership Research: Basic Styles

Some leadership-research studies have concentrated upon ermining a set of basic leadership styles used by managers. roll Shartle, at Ohio State University (1956), classified dership behavior into two independent factors: "initiating ucture" and "consideration" (Stogdill and Coons, eds., 1957

Research undertaken at the University of Michigan in 1947 e rise to the "Michigan style continuum"(Guetzkow, ed., 195 n and Katz, 1960), which suggested that leader behavior ran m an employee-centered extreme to a production-centered ext

Bales (1933) of Harvard University, found in his studies small-group behavior that most groups possess two different s of leadership needs. These needs are satisfied by the

sk leader" and the "socio-emotional leader" roles generally led by two different members of the group.

dership Effectiveness Research: Ideal Styles

Effectiveness research has been conducted by psycholo-ts in an attempt to determine: (1) whether one leadership le is more effective than another and (2) whether an ideal le exists.

In their experiment on the use of the participatory agement style, L. Coch and J. R. P. French, Jr. (1947) nd that the performance of production workers was enhanced n the workers were allowed to participate fully in matters ating to proposed changes. However, subsequent studies by nch (1960), Vroom (1960) and Tannenbaum (1954) concluded t the participatory approach should be used only on those ividuals who want it; effects of the participatory style dependent on worker's attitudes.

R. C. Anderson (1959) reviewed studies utilizing various ther-or" leadership approaches (as "autocrat" versus "demo-t," "directive" versus "nondirective," "supervisory" versus rticipatory," and "boss-centered" versus "employee-centered' erson found that these approaches were not accurate in des-oing leadership behavior and that no single type of behavio generally more effective than another.

S. S. Sales (1966), Dunteman and Bass (1963), and Patchen 62) separately arrived at the conclusion that democratic, interaction-oriented, supervision can actually be less

ective than autocratic, or task-oriented, supervision many instances.

E. A. Fleishman and D. R. Peters (1962) determined from ir work that whether a manager had greater concern for ucture or consideration had no bearing on the manager's ed effectiveness.

Finally in 1966, A. K. Korman reviewed twenty-five dership studies and concluded that a manager's effec- eness could not be predicted simply by determining whether placed more emphasis on consideration or initiating struc- e; neither style is better than the other in every case.

avioral Theories

Several different, and sometimes conflicting, viewpoints expressed by the various behavioral theories currently ular; a few will be mentioned here.

Maslow (1954) propounded that there are five types of an needs which individuals seek to satisfy in the following er: physiological, safety, belongingness and love, esteem, self-actualization. (This theory of subordinate psycholog ld explain why an employee with his first four needs satis- d might value self-actualization more than a raise in pay.)

McGregor (1960) developed two sets of assumptions typi- ng the feelings managers have about personnel: (1) Theory that people need to be closely controlled and even forced work toward the achievement of organization objectives and Theory Y, that people are self-directed and creative at

k when properly motivated. In terms of Maslow's theore-
al hierarchy of needs, McGregor thought man today has
gely satisfied his security needs and that Theory Y rather
a Theory X was the type of leadership better suited to
isfying mans' higher order needs of autonomy and esteem.

Katz (1955) proposed that effective administration rests
three basic administrator skills: (1) technical skill,
understanding of, and proficiency in, a specific kind of
ivity," (2) human skill, "the ability to work effectively
a group member," and (3) conceptual skill, "the ability
see the enterprise as a whole." The relative importance
these skills varies according to the individual manager's
ition in the organizational hierarchy.

A five-style grid model was proposed by Blake (1964)
oting managerial styles and behavior: 1.1 for too weak,
for too soft, 9.1 for too hard, and 9.9 for ideal mana-
ial behavior. Middle-of-the-road behavior falls into the
style category. This ideal-style model does not empha-
e technological demands or the situation in which the
ager works.

McClelland of Harvard University (1961, 1962) investi-
ed the need for achievement (N-ACH). A person possessing
igh N-ACH is more concerned with self knowledge that he
done well than with rewards such as money or praise. He
most effective when the situation allows him to proceed
his own efforts and not to depend on chance or on other
ple.

Likert's (1961, 1967) model of four organizational
les, or philosophies, are called systems 1 through 4.
tems 1 and 4 are extremes of a continuum denoting: (1)
degree of confidence or trust management has in the sub-
inates (none in system 1, complete in system 4); (2) the
ination of goals and decisions and the concentration of
trols (with only management in system 1, widely dispersed
system 4); (3) the method of subordinate motivation (fear,
eats, and punishment in system 1, participation and involve-
t in system 4), and (4) whether informal organizations whic
se oppose (system 1) or support (system 4) goals of the
nal organization. Likert believes in system 4 as the sin-
ideal style; his view is psychological rather than
iological or technological.

According to Herzberg's Motivation Hygiene Theory (1957,
), 1966), industrial man has two independent groups of
ls: job environmental and job enrichment. Changes in the
ip of needs consisting of environmental or hygiene factors
ney, status, security, policies, procedures, administration,
ervision, and working conditions) can lower dissatisfaction
not increase satisfaction. Changes in the motivators or
factors (challenging work, achievement, recognition for
mplishment, increased responsibility, and growth and de-
opment of subordinates) can improve motivation and performar
short, dissatisfaction is most likely to arise from elements
the job environment while satisfaction will generally arise
n enrichment elements in the job itself.

Fiedler's Leadership Contingency Model (1966) expresses dership effectiveness as a function of the extent to ch style matches the situation. This behavioral theory tures (1) position power of leader (the degree to which position possesses the power to obtain subordinate com- ance); (2) structure of task (the extent to which the der is allowed to control his group members by program- g tasks); and (3) leader-member relations (the degree to ch leader-member relations are good) as independent situ- onal dimensions. Leader-member relations are considered d when subordinates would choose the same person as co- ker and leader in similar tasks, when the leader is most luential, and when the leader feels accepted and relaxed.

din's Managerial Effectiveness Theory

Reddin (1970) in his "3-D Theory" of managerial effec- eness expounded his belief that two basic dimensions exist the form of the task and the interpersonal relationships olved, and these are the two main determinants of desired agerial behavior. Style names were assigned to the four sible combinations of task orientation (TO) and relation- ps orientation (RO).

Thus, high TO and low RO was labeled "dedicated"; low TO high RO was labeled "related"; low TO and RO were termed parated"; and high TO and RO were designated "integrated."

Further, Reddin felt that none of these four styles was e or less effective in itself, and that any style could be

ctive in particular situations but not effective in other ances. Thus, a manager is effective only when his lead- ip behavior matches the demands of his situation. For ple, a manager using a high RO would be classed as inef- ive if the situation required a low RO.

Figure 2 illustrates the three dimensions of the theory names the more and less effective managerial styles. A ger using a high relationships orientation and a low task ntation would be called a "developer" if the situation ired high RO and low TO but a "missionary" if the situ- nal demands were different.

Reddin believes an effective manager must possess three ls: situational sensitivity (the ability to read a situ- n), situational management skill (the skill to change the ation if necessary), and style flexibility (the use of a ety of styles to match a variety of situations). In t, effectiveness depends on using the appropriate behavior atch the situation.

The "3-D Theory" divides the situation into five all- usive components: superior, co-workers, and subordinates h word used as it is normally defined); organizational osophy (all influences on behavior originating from out- both the manager's own work and his department and ecting systems design, operating procedures, and company cy); and technology (the way work is accomplished). As ioned previously, each of these five situational elements been the focus of a leadership school of thought.

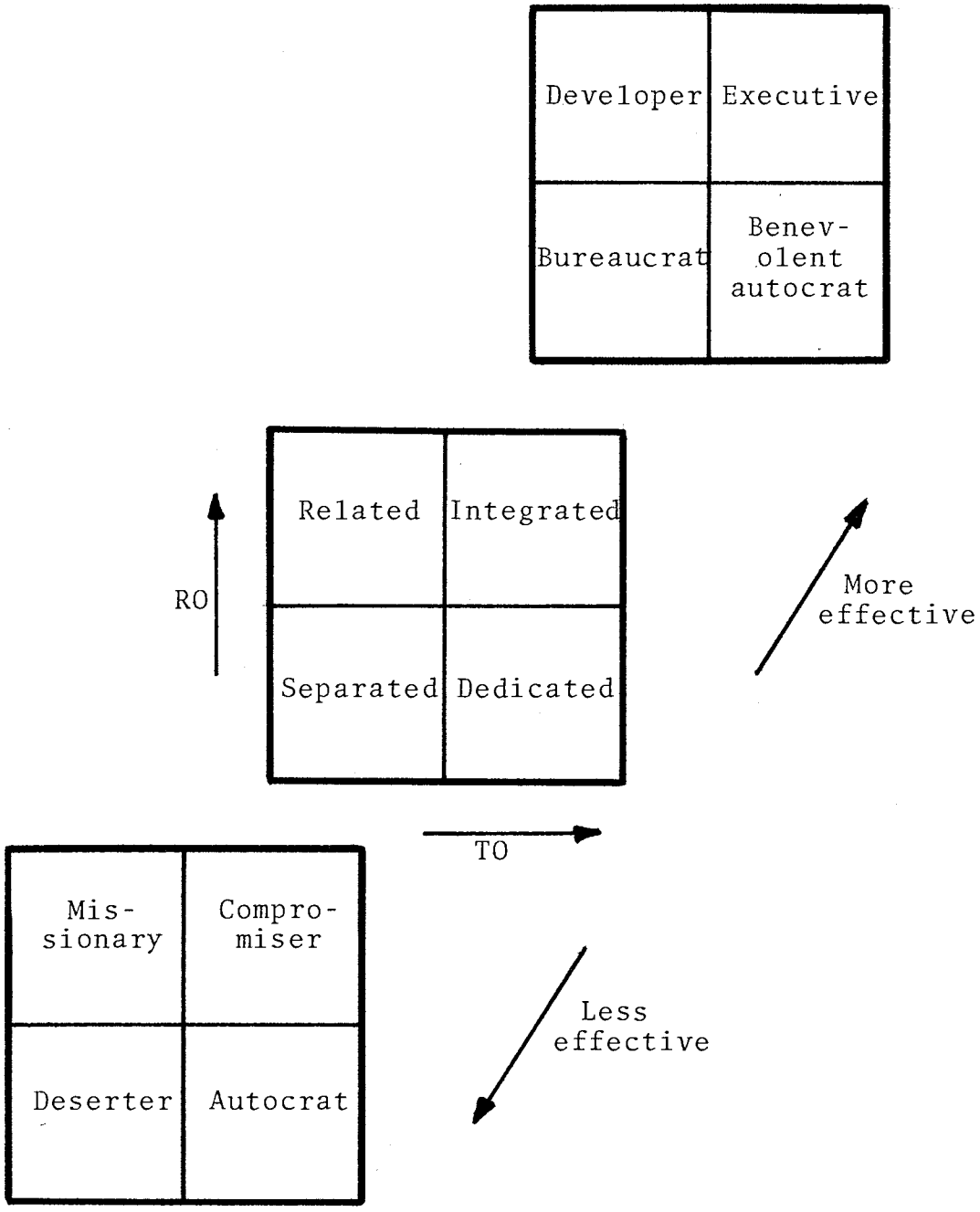

Figure 2. Reddin's Three Dimensions of Managerial Styles

ıership Style Concepts Comparison

Several theories describing basic leadership styles ;ain similarities, although some recommend an ideal le and others do not. Table II, adapted from Reddin 70), lists ten classifications in table form and shows each author's basic styles are approximately equiva- : to the four styles labeled "separated," "related," licated," and "integrated."

ıary of Studies of Leadership Styles

As in the case of technology, a review of the litera- : on leadership styles also reveals a wide variety of :rging theories, ideas, and concepts. All of the theories concerned with the style of leadership which best pro- :s organizational effectiveness. The theories of Reddin 70) are particularly appropriate and are based on two :nsions of managerial behavior--task orientation and ıtionships orientation. The four basic styles of lead- ıip (dedicated, separated, related, and integrated) result ı the possible combinations of task and relationships :ntation (each may have a low or high degree of emphasis).

Reddin outlined five components of a manager's "situation" :rior, co-workers, subordinates, organizational philosophy, technology. He felt no one of the four basic leadership .es to be more or less effective in itself, but that a .ger is effective only when his leadership behavior matches demands of his situation.

	SEPARATED	RELATED	DEDICATED	INTEGRATED
Reddin (1970) more effective style equivalent	Bureaucrat	Developer	Benevolent autocrat	Executive
Reddin less effective style equivalent	Deserter	Missionary	Autocrat	Compromiser
McGregor (1960) equivalent	---	---	Theory X	Theory Y
Blake (1964) equivalent	3.3	3.7	7.3	7.7
Brown (1954) equivalent	Laissez faire plus strict autocrat	Incompetent democrat plus genuine democrat	Incompetent autocrat	Benevolent autocrat
Jennings (1962) equivalent	Abdicrat plus bureaucrat	Democrat	Autocrat	Executive plus neurocrat
Walling (1964) equivalent	Objective thinker	Friendly helper	Tough battler	---

TABLE II (Continued)

	SEPARATED	RELATED	DEDICATED	INTEGRATED
Davis (1968)	Custodial	Supportive	Autocratic	Collegial
Horney (1945)	Moving away (detached)	Moving toward (compliant)	Moving against (aggressive)	---
Zaleznik and moment (1964) equivalent	Rational--procedural	Maternal--expressive	Paternal--assertive	Fraternal--permissive

One purpose of the present study is to explore the lationship between a manager's leadership style and his rception of organizational effectiveness; quantitative thods will be used to analyze this relationship. Managers ll complete a questionnaire designed to determine both the sic leadership style they employ (their combination of sk and relationships orientation) and their perception of ganizational effectiveness. A regression analysis will en indicate the strength of the relationship.

Summary

Organizational effectiveness was discussed very infor-lly in the context of the study of Collins; an altered rsion of his questionnaire will be used in the present udy.

The literature on technology and leadership styles has en reviewed; the fact that a wide variety of diverging eories, ideas, and concepts exist in these areas is evi-nt. Reddin's ideas are especially appealing because of s emphasis on the demands technology makes on managerial navior rather than on worker behavior, and because he els no one managerial style is always appropriate. A nager will be effective only when his leadership style tches the combination of task and relations dictated by s job situation.

The literature yields information which is interesting en tied together. Mahoney and Frost (1972) believe that

ıology determines criteria of organizational effectivesess. ɾt (1961) observed that technology influences the conse- ːes of leadership style. Reddin believes all elements of job situation influence leadership style.

The present study will analyze the relationship between ıager's job situation and his perception of an effective ıization. His situation will be broken down into his ɔnal background, characteristics of his job, character- ːs of his organization, the technology of his work, and ːeadership style. All variables will be determined via ːstionnaire, with particular attention to the degree of and/or relationships orientation characteristic of the ɡer's technology and leadership style. A regression ʳsis with the manager's perception of an effective or- ːation as the dependent variable will then detail the ːionships involved.

CHAPTER III

RESEARCH METHOD

The wide range of theories concerning organizational ef-
ctiveness, technology, and leadership style was exposed in t
erature review. This chapter explains the specific methods
lized in this study to assess a manager's perception of an
ective organization as well as his personal background, the
racteristics of his job, the characteristics of his organi-
ion, the technology of his work, and his leadership style.

The acceptability of using questionnaires as data-
hering devices is illustrated by many empirical studies in
literature; two examples are provided by Mott (1972) and
oney and Weitzel (1969).

For the present study a four-part instrument was admini-
red three times to a total of 65 employees at NASA-JSC.
first part of the questionnaire was developed by the
hor and contains questions concerning the manager's per-
al background and characteristics of his job and of his
anization. The second part measures a manager's percep-
n of an unspecified but effective organization and is a
densed version of an instrument developed by Collins in
3. The third section was developed by the author (1973)
describes the technology in which a manager works.

nally, the fourth part is Reddin's "Management Style agnosis Test" (1972).

Managerial perception of an effective organization ıe second section of the questionnaire) is the dependent riable for this study. The first, third, and fourth ctions all measure independent variables. Following a scussion of the sample and the procedure, each section the instrument will be discussed in turn.

Factor analysis, the process by which a large number raw variables are trimmed to the few most significant l representative variables, will be explained.

Finally, the stepwise regression analysis will be dis- sed. The purpose of this analysis is to test the strength the relationship between the dependent and independent iables.

The Sample

ocurement of the Sample

Through joint cooperation of the NASA-JSC Employee elopment Office, the University of Houston, and Oklahoma te University, a series of three management development ss sessions were conducted on the JSC site. Although se sessions were primarily for managerial development, y were of vital importance in obtaining data for this dy. Indeed, the four parts of the questionnaire devel- d for this study was administered to the participants

comprised the entire selection of materials used in training sessions.

Letters explaining the nature of the development ses-ıs and urging all managers to attend were sent directly individuals in managerial positions as well as to all ırtment heads. A respectable number of persons did attend least one of the three sessions so that a usable sample of subjects was obtained.

ɔle Characteristics

A profile of the participants is shown in Table III. ı is given for the entire sample of 65 as well as for ı part of the split sample; the sample was divided at median according to whether they rated their own organi-ion effective (N=34) or less effective (N=31).

A few points should be made. First, a large proportion .5 percent) of the sample holds an engineering degree; ; is to be expected in an administrative research and ɛlopment organization such as NASA-JSC. It is surprising, ɛver, that 9.3 percent hold no college degree at all.

The questionnaires were administered anonymously. ɛs and in some cases directorates were not revealed, as .ained in the Participant Profile.

The Procedure

The participants were first asked to complete all four ɛs of the instrument. A discussion of classic leadership theo

TABLE III

PARTICIPANT PROFILE

	Total Sample (N=65)	Persons Having an Effective Perception of Organization (N=34)	Persons Having a Effectiv Percepti Organiza (N=31)
:age Age (Years)	40.2	40.5	39.9
:age Level of :ation	Some Graduate Training	Some Graduate Training	Some Graduate Training
lemic Discipline (%)			
ıgineering	41.5	35.3	48.4
ısiness	24.6	26.5	22.6
:ientific	15.4	14.7	16.1
·ts	3.1	2.9	3.2
:chnical (Non-Engineering)	1.5	0	3.2
:hers	4.6	8.8	0
) College Degree	9.3	11.8	6.5
·s of Full-Time Work :rience (Average)	17.7	18.5	16.8
·s in Present (Average)	6.2	5.8	6.6
·-JSC Directorate (%)*			
ıgineering and Development	24.4	25.0	23.8
lministration	24.4	25.0	23.8
.ight Crew Operations	20.0	16.7	23.8
.ight Operations	13.3	20.8	4.8
:ience and Applications	6.7	4.2	9.5
.fe Sciences	2.2	0	4.8
·ogram Office	0	0	0
:her	8.9	8.3	9.5
·ee to Which Job is .gerial in Nature (%)	60.5	65.2	55.3
·ee to Which Job is .nical in Nature (%)	55.3	54.0	57.0

TABLE III (Continued)

	Total Sample (N=65)	Persons Having an Effective Perception of Organization (N=34)	Persons Having a Effectiv Perceptic Organiza (N=31)
ee to Which Job ires Contact With r JSC Organizations (%)	72.5	71.5	73.7
f Position (%)	40.0	35.3	45.2
Position (%)	60.0	64.7	54.8
1 Number of rdinates rage)	15.1	19.9	9.8
rdinates Reporting ctly rage)	5.4	5.6	5.3
rdinates Reporting ctly Who are Aides rage)	1.1	1.1	1.1

is information was not divulged by all participants; the entages refer to only those who did name their directorate: 45 of 65 persons, (2) 24 of 34 persons, and (3) 21 of 31 ons.

; then given, followed by a specific explanation of the ;trument and its implications for managerial development.

Results of the technology and leadership style instru- ıts could prove disappointing to a manager who finds he ; a low task and low relationships orientation even though is later assured such behavior may be the best possible his situation. Further, no manager wants to have his style leadership described as being ineffective. To prevent sub- :tive manipulation of the data, the numeric values for the ır basic technology styles and the four effective and four :ffective leadership styles were collected before the mana- ·s were exposed to enough information to allow them to .ipulate their data. The data on the manager's personal :kground, characteristics of his job and organization, and perception of an unspecified but effective NASA-JSC divi- ın were collected at the same time. Only then was data red and interpreted and plotting procedures explained.

The Questionnaire

sonal Background, Job Characteristics, and Organizational racteristics

This section is designed to procure biographic and demo- phic information, thus painting a background picture of individual participants. Questions inquire about such ngs as the manager's age, the number of his subordinates, his NASA-JSC directorate. The complete section, as well

ıe other three sections of the instrument, are shown in ıdix A.

ıizational Effectiveness

The second section is a direct result of the study made ɔllins of 93 people at NASA-JSC in Fall, 1972. He devel- a questionnaire in which each person is asked to rate ıost effective JSC division with which he is familiar, least effective JSC division of which he has knowledge, ıis own division. The person's name and the divisions he .ders to be most and least effective are kept anonymous. :hree sections of Collins' questionnaire are identical :onsist of 45 word pairs, each pair utilizing the concept modified semantic differential with an eight-point Likert ›. An example of this concept for one word pair is shown ı:

A Dissonant Organization	_:_:_:_:_:_:_:_	A Harmonious Organization

After gathering data, Collins conducted a factor analysis . separated the 45 word pairs into 8 factors. The word within each factor were correlated in that they tended have similarly, or reflect the same underlying idea, for ifferent measures of the particular attributes.
For purposes of the present study, 19 word pairs in 5 rs are condensed from Collins' work as being the most ficant, for they "loaded" the heaviest in his factor

ysis. A further alteration is made in that each person sked to rate only the most effective JSC division with h he is familiar. The 19 scales in this questionnaire the same in wording and direction as they were in Collins' tionnaire and are therefore randomly reversed. In other s, some scales go 1 to 8 from left to right while others to 1 from left to right; the numbers 1 through 8 were provided with the scales to disguise the reversal. In case the number 1 represents "most characteristic of ctiveness" while 8 represents "least characteristic of ctiveness." The scale order for each question as well ıe five factors are specified in Appendix B.

After a position representing a number between 1 and 8 arked on each of the 19 scales, the 19 represented num- are added to yield a sum between 19 (19 x 1) and 152 x 8). This sum (EALL) represents the degree to which manager feels the group of 19 traits is typical of the effective JSC division. The lower his EALL score, the he feels the most effective JSC division to be harmo- s, progressive, and sociable rather than a dissonant, ıant, and unsociable, for example. EALL thus represents ıager's perception of the most effective JSC division which he is familiar.

Technology

As mentioned in the literature review, style names (separat ; dedicated, or D; related, or R; and integrated, or I)

sent the four possible combinations of task orienta-
and relationships orientation. The technology of a
cular job demands that the manager use one or more of
asic styles depending on the combination of TO and RO
red. Choosing which style is appropriate is facili-
by four sets of style "descriptors," one set for each
. See Appendix C. If, for instance, the separated
descriptors best portray the technology of the job,
the technology demands that the manager use a separated
.

The technology instrument developed by the author con-
of 36 pairs of statements. For each of the 36 pairs,
articipant has the choice of selecting either the state-
labeled "A" or the one labeled "B," whichever best
ibes his job technology. In each pair, statement "A"
technology descriptor for one of the four styles while
ment "B" is a technology descriptor for a different
. See Appendix E. The "Technology Score Sheet" was
ned for ease of scoring and is arranged in a grid pattern
lustrated in Appendix F.

Not all of the separated technology style descriptors
separated style was chosen as an example) represent a
tion of low TO and low RO. Some represent only low RO
hus are in common with the "low RO aspect" of the dedi-
style. It is for this reason that only those style
iptors which differentiate between low TO and high TO
nvolved in comparisons between these two styles.

arly, only those style descriptors which differentiate
en low RO and high RO are involved in comparisons be-
the separated and related styles. In other words,
risons between styles are made in such a way as to lend
ng to these comparisons. Appendix D lists the style
iptors paired in groups of basic styles and then lists
same 36 pairs in the order they appear in the techno-
assessment instrument.

After a participant places a letter "A" or "B" in each
e 36 squares of the scoring grid, simple instructions
e him to determine values for the basic styles; a num-
etween 0 and 18 (with all four totaling 36) corresponds
ch style. Any style with a value from 13 to 18 (upper
hird) is labeled "dominant" while any style with a value
7 to 12 (middle one-third) is labeled "supporting."
A TO score is found by adding the dedicated and inte-
d values (the two styles characterized by high TO); RO
und by adding the related and integrated values (both
s characterized by high RO). This gives two numbers,
between 6 and 30; 6 is subtracted to give a TO score
n RO score each with the limits 0 and 24. Even if a
n was completely relationships oriented, he would still
a TO score of 6 because of the "forced-choice" nature
e questionnaire. When a TO and an RO alternative are
red, such a person would select the RO choice. But in
of the six questions comparing "separated" and "dedicated"
two TO alternatives), the participant is forced to select

choice. This explains why the minimum value for either
: RO is 6.

A two-dimensional coordinate system is then established
TO along the horizontal axis and RO along the vertical

The four basic managerial styles are easily located
ıis coordinate system, as shown in Appendix G.

Each dominant style is plotted by drawing a small circle
:s corresponding quadrant of the graph in the corner of
ıuadrant opposite the center point (12,12). Each supporting
: is plotted by drawing a small circle in its corresponding
:ant of the graph in the corner of the quadrant nearest the
:r point (12,12). The average style demanded by the tech-
;y is plotted by locating with an "X" the point (TO,RO).
)les illustrating the procedure for three different sets
:parated, dedicated, related, and integrated style scores
ır in Appendix G.

Only an understanding of the concepts of dominant, sup-
.ng, and average styles is important to this study; the
:ing procedure outlined above was useful in providing an
liate explanation of their scores to the participating
;ers.

It was not possible to administer the technology instru-
to a test sample to check its validity. However, the
:ument used in this study to assess technology was patterned
: Reddin's thoroughly-tested "Management Style Diagnosis
." Also, the scores for the final sample of 65 managers
:11 as for two subsets of this group (N = 31 and N = 34)

ot seem unreasonable when the situation is considered. Table IV. The instrument was administered on a group s in sessions where attendance was completely voluntary; sessions were advertised in part as being of a manage- development nature. It is the author's contention that e managers who took time to attend the sessions would to be more relations-oriented than average, and even would tend to respond in a more-than-average relations- nted fashion in the setting of a management development se. After all, it is well known that a relations orien- on is being stressed in many managerial development ions, so the same could have been expected (though in- ectly) here. This would explain the consistently lower rated and dedicated style scores and consistently higher grated and especially higher related style scores.

ership Style

The instrument used in this study to assess a manager's ership style is Reddin's "Management Style Diagnosis ." This test consists of 64 pairs of statements; for of the 64 pairs, the manager has the choice of selecting er the statement labeled "A" or the one labeled "B," h ever best describes his leadership style. After the ger places a letter "A" or "B" in each of the 64 squares he scoring grid, simple instructions enable him to deter- values for eight leadership styles (the effective and fective versions of the four basic styles). All twelve

TABLE IV

TECHNOLOGY SCORES: FOUR BASIC STYLES

YLE	N = 65	N = 31	N = 34
rated	6.7	5.8	7.4
ted	12.6	12.8	12.4
cated	6.9	6.8	7.1
grated	9.8	10.6	9.1
	36.0	36.0	36.0

ıese styles are listed in Table V; ineffective styles
ɔate the manager's leadership style does not match the
ıds of the five components of his situation (superiors,
ɔrkers, subordinates, technology, and organizational
ɔsophy). Numbers corresponding to the eight styles
a maximum possible range of from -3 to +18 (with all
t totaling 66).

Any style with a value of 11 or over is labeled "dominant"
ɜ any style with a value of 10 is labeled "supporting."
A TO score is found by adding the values of the autocrat,
ʋolent autocrat, compromiser, and executive styles (the
styles characterized by high TO). RO is found by adding
ʋalues of the missionary, developer, compromiser, and
ıtive styles (the four styles characterized by high RO).
ɜffectiveness" (or "E") score is found by adding the
ɜs of the bureaucrat, benevolent autocrat, developer,
ɜxecutive styles (the four "effective" styles). Values
), RO, and/or E which are 34 or above are considered
while values below 34 are considered low.

Analysis of Data

The purpose of this chapter has been to explain the
ific methods utilized in this study to assess a manager's
ɜption of an effective organization as well as his per-
l background, the characteristics of his job, the charac-
ɜtics of his organization, the technology of his work,
ıis leadership style. Procurement of the sample and

TABLE V

LEADERSHIP STYLES

EFFECTIVE GERIAL STYLE	BASIC STYLE	LESS EFFECTIVE MANAGERIAL STYLE
utive	Integrated	Compromiser
volent crat	Dedicated	Autocrat
loper	Related	Missionary
aucrat	Separated	Deserter

le characteristics have both been discussed, as was the
edure by which data was obtained. Each of the four
s of the questionnaire have been explained in detail in
s of both structure and the expected information to be
ined.

The complete process by which the data were analyzed
now be explained. This includes topics ranging from
scussion of the concepts involved in factor analysis
process by which a large number of raw variables are
ned to the few most significant and representative
ables) and stepwise regression analysis (the process
ich the strength of the relationships between the
ident and independent variables is tested) to an ex-
ation of how the results of these analyses would be
in testing the hypotheses of this study.

After all data was gathered, a computer program was
ten to calculate the following for each manager:

(1) EALL, or his overall perception of an unspecified but effective NASA-JSC division,
(2) scores for each of the five factors on the instrument measuring his perception of an effective NASA-JSC division,
(3) the TO and RO scores of his job technology,
(4) the average style required by his technology,
(5) the dominant styles required by his technology,
(6) the TO, RO, and E scores of his leadership style,
(7) his average leadership style, and
(8) his dominant leadership styles.

e calculated values plus the following raw data for each
ger:

(1) his four technology basic style scores,
(2) his four leadership effective style scores,
(3) his four leadership ineffective style scores,

(4) his personal background,
(5) characteristics of his job, and
(6) characteristics of his organization

)rise 80 variables, many of which are not independent of
ı other.

Factor analysis is a general scientific method by which relationships among a group of variables may be accounted by a smaller number of variables, or common factors. It :erns regularity and order in phenomena by taking measure-:s and qualitative observations and resolving them into :inct patterns of occurrence. The variables in each cate-', or cluster, are highly intercorrelated with each other. :or analysis applied to discern patterns of profile simi-.ty of individuals is called Q-factor analysis. In this ly R-factor analyses were applied to delineate patterns /ariation in characteristics (the 80 variables) of the .viduals.

The 80 variables were trimmed to the 23 which were most ıificant in terms of this study. Selection of the most .cally relevant variables was accomplished in conjunction ı an examination of the correlation coefficients between :ors and variables (several factor analyses); this faci-ıted the reduction to those variables which were most :esentative of the factors as well as most significant ı logical sense.

The basic concept of multiple regression is to produce inear combination of independent variables which will :elate as highly as possible with the dependent variable.

; linear combination can then be used to "predict" values
:he dependent variable. The difference between the value
:he dependent variable and the value predicted by the
:ar combination of the independent variables is known as
residual. The regression equation is then written as
.ows:

$$D = b_1 I_1 + b_2 I_2 + \ldots b_n I_n + c + r$$

:e D is the dependent variable, the I's are the independent
.ables, the b's are the regression coefficients (unnorma-
:d), c is a constant, and r is the residual.

Many of the properties of multiple regression may be under
)d by considering the residual. The residual has mean zero,
its standard deviation is the smallest possible for any
:ar combination of the given independent variables. In othe
ls, if the b's in the regression equation are replaced by an
:r values, then the standard deviation of the residual will
.arger. In this sense, the regression equation provides an
.mum prediction of the dependent variable. A consequence of
; optimization is that the residual and any independent vari
: have zero correlation.

The stepwise regression routine utilized in this study is
of a series of programs outlined in UCLA's Biomedical Com-
:r Programs (1964). It computes a sequence of multiple
:ar regression equations in a stepwise manner. At each
) one variable is added to the regression equation. The
.able added is the one which makes the greatest reduction

he error sum of squares. Equivalently it is the variable h has highest partial correlation with the dependent vari- partialed on the variables which have already been added; equivalently it is the variable which, if it were added, d have the highest F value. In addition, variables can be ed into the regression equation and automatically removed their F values become too low.

If a relationship exists between two variables x and y, variables are said to be correlated. An estimate of y is precise if it is made on the condition that x is known without reference to x. A device which measures the re- ion in the variability of the distribution of y given a ession of y on x will also measure the closeness, or ngth, of the relationship between x and y.

The coefficient of determination (R^2) and the correlation ficient (R) are two ratios designed to measure the propor- al reduction in variability of y given a regression of y . R^2 is the proportion of total variance accounted for by ar regression. Its values may range from 0 (prediction of not improved whatsoever by knowing x) to 1 (knowing x letely determines y). R may range from -1 to +1; R is bet- known and more widely used than R^2.

a' (throughout this paper, a' will be used to represent α) he level of statistical significance and may range from 0 . (1 - a') is the probability of making a correct decision of avoiding a Type I error. If $R^2 = 0.600$ with $a' = 0.001$, example, it is 99.9 percent certain that the proportion of

total variance accounted for by the regression of y on
; 0.600. This value of R^2 is thus extremely reliable.

Of the 23 variables chosen with the aid of factor ana-
.s, EALL was selected as the dependent variable for the
'ession analysis; the other 22 thus became independent
.ables. They are as follows for each manager:

(1) the TO and RO scores of his job technology,
(2) three of his leadership effective style scores (separated, related, and dedicated),
(3) his counterpart three leadership ineffective style scores (separated, related, and dedicated),
(4) whether or not he received a college degree in the field of engineering,
(5) his age,
(6) the number of his subordinates who report to him directly,
(7) the level of skill required for his subordinates to properly perform their tasks--on a scale of 1 (much) to 7 (little),
(8) the extent to which his job is managerial--on a scale of 1 (completely) to 7 (not at all),
(9) the extent to which his job is technical--on a scale of 1 (completely) to 7 (not at all),
(10) the percentage of his subordinates' total man-hours that they are required to perform routine tasks, and
(11) whether or not he is employed in each of the following NASA-JSC directorates: Engineering and Development (E. and D.), Science and Applications (S. and A. D.), Life Sciences (L. S. D.), Flight Crew Operations (F. C. O. D.), Flight Operations (F. O. D.), Administration (A. D.), or some "other" organization.

variables labeled (4) and (5) describe the manager's per-
.l background; those labeled (6), (7), (8), (9), and (10)
:ribe the characteristics of his job; and the variables
:led (11) describe the organization to which he belongs.

Each of the two hypotheses to be tested in this study
:oncerned with the relationships between a manager's per-
:ion of an effective organization and each of five classes

ariables. While these five variable classes are cer-
.ly not independent of one another, the actual interre-
onships involved are not readily apparent. A manager's
.eption of an effective organization may be dependent
. one class of variable, which is in turn dependent upon
cond class of variable, and so on. It is feasible that
following chain of dependencies might hold for this
y:

(1) a manager's personal background variables determine his
(2) job variables, which determine his
(3) organization variables, which determine his
(4) technology variables, which determine his
(5) leadership style variables, which finally determine his
(6) perception of an effective organization.

rtial test of the validity of this chain of dependencies
. be conducted by first forcing the independent variable
ses to enter the stepwise regression routine in the above-
d order, and then allowing these same variable classes to
r freely (in no predetermined order). Very similar re-
s obtained by these two procedures would suggest the chain
lependencies mentioned above to indeed be valid.

t Hypothesis

The first hypothesis is that a manager's perception of
nspecified but effective organization is not related to:
his personal background, (2) characteristics of his job,
characteristics of his organization, (4) the technology,
or (5) his leadership style.

The stepwise regression routine was performed five times
est the first hypothesis; EALL was always the dependent
able. The first time the manager's personal background
ables, his job variables, and his organization variables
forced to enter as independent variables in that order.
e same independent variables were allowed to enter freely
ne second run.

The third time the technology variables and leadership
e variables were independent and forced to enter in the
owing order: (1) technology RO, (2) technology TO, (3)
ership dedicated effective, (4) leadership dedicated in-
ctive, (5) leadership related effective, (6) leadership
rated effective, (7) leadership related ineffective, and
leadership separated ineffective. These same independent
ables were allowed to enter freely in the fourth run.

All 22 independent variables were allowed to enter freely
ne fifth run.

nd Hypothesis

The second hypothesis is that a manager's perception of
effectiveness of his own organization has no effect on the
tionship (if a relationship does indeed exist) between his
eption of an unspecified but effective organization and:
his personal background, (2) characteristics of his job,
characteristics of his organization, (4) the technology,
or (5) his leadership style.

To test the second hypothesis, the 65 managers were rated into two different groups according to the manner hich the following question was answered:

How would you rate the overall effectiveness of your present JSC division (the one in which you work)? Please circle the number which is most representative of your opinion:

1	2	3	4	5	6	7	8
Extremely Effective			Moderately Effective			Not very Effective	

mean of the 65 responses to this question was 3.54; the an was also between 3 and 4 with 34 managers answering a number less than or equal to 3 (a more than moderately ctive perception of their division) while 31 managers in- ted a number greater than or equal to 4 (the perception their division is effective to only a moderate extent or). The sample was split at the median.

The stepwise regression routine was performed five times the sample of 34 and in an identical manner five times the sample of 31. Each of the two sets of five runs h N = 34 and with N = 31) was also identical to the set ive runs conducted to test the first hypothesis (with 65).

Summary

Procurement of the sample and sample characteristics both discussed, as was the procedure by which data was ined. Each of the four parts of the questionnaire were

ained in detail in terms of both structure and the ex-
ed information to be obtained.

Finally, the complete process by which the data were
yzed was explained. This included topics ranging from
scussion of the concepts involved in factor analysis
stepwise regression analysis to an explanation of how
results of these analyses would be used in testing the
theses of this study.

CHAPTER IV

PRESENTATION AND DISCUSSION OF THE FINDINGS

The results of the stepwise regression analysis of the will be presented and examined. Only the regression runs with the sample of 65 managers will be utilized in dising the first hypothesis; consideration of the second thesis depends upon all regression runs.

A series of figures presenting numerical data will support discussion. These figures will indicate the following for regression run:

(1) the number of managers in the sample (N),
(2) the number of regression steps,
(3) the variable entered in each step,
(4) the class of each variable entered,
(5) the new multiple correlation coefficient (R) at each step,
(6) the new multiple coefficient of determination (R^2) at each step, and
(7) the level of statistical significance (a').

e VI will prove helpful as a guide to the independent ables.

First Hypothesis

The first hypothesis is that a manager's perception of nspecified but effective organization (EALL) is <u>not</u> related he five classes of variables outlined in Table VI. The

TABLE VI

INDEPENDENT VARIABLES

.able ›de ıber	Class of Variable*	Variable Abbreviation	Variable
2	1	Engg	Engineering Degree
8	1	Age	Age
.2	2	Sub	Subordinates Reporting Directly
.5	2	Skill	Subordinate Skill
.8	2	Mgr	Managerial Extent of Job
.9	2	Tech	Technical Extent of Job
:2	2	Rout	Routine Subordinate Tasks
:6	3	ED	Engineering and Development
:7	3	SAD	Science and Applications
:8	3	LSD	Life Sciences
:9	3	FCOD	Flight Crew Operations
30	3	FOD	Flight Operations
31	3	AD	Administration
33	3	Other	Other Organizations
39	4	TTO	Technology Task Orientation
40	4	TRO	Technology Relations Orientation
49	5	LSI	Leadership Separated Ineffective
50	5	LRI	Leadership Related Ineffective
51	5	LDI	Leadership Dedicated Ineffective
53	5	LSE	Leadership Separated Effective
54	5	LRE	Leadership Related Effective
55	5	LDE	Leadership Dedicated Effective

:lass of Variable" Code

1) Personal Background
2) Job Characteristics
3) Organization (Directorate)
4) Technology
5) Leadership Style

sample of 65 managers was used in all tests of this thesis.

Table VII compares the stepwise regression runs which independent variable classes 1, 2, and 3 forced to enter hat order as opposed to these same variables allowed to r freely. Both personal background variables (class #1) all job characteristic variables (class #2) except for "managerial extent of the job" entered to explain EALL an R of 0.367 and an a' of 0.05 when entry was forced. wing free entry demonstrated the significance of the nizational variables (class #3) with members of this s entering first (LSD) and third (FCOD) out of a total of variables. "Age," "subordinates reporting directly," "technical extent of the job" remained as the only vari- s entering in both runs; R = 0.458 and a' = 0.001 for free-entry case.

Table VIII compares the stepwise regression runs which independent variable classes 4 and 5 forced to enter in order as opposed to these same variables allowed to enter ly. Both technology variables (class #4) and "leadership cated effective" and "leadership dedicated ineffective" ss #5) entered to explain EALL with an R of 0.329 and an f 0.05 when entry was forced. These same leadership vari- s entered first and third and were joined by "leadership rated effective" and "leadership related ineffective" and lly by "technology task orientation" when entering freely;

PERSONAL, JOB, AND ORGANIZATION VARIABLES
(Total Sample)

Step Number	Total Sample Run #1, a' = 0.05				Total Sample Run #2, a' = 0.001			
	Variable Entered	Class (Forced)	Multiple R	R^2	Variable Entered	Class (Free)	Multiple R	R^2
1	Age	1	.207	.043	LSD	3	.251	.063
2	Engg	1	.251	.063	Age	1	.331	.109
3	Skill	2	.290	.084	FCOD	3	.388	.150
4	Rout	2	.320	.103	Sub	2	.429	.184
5	Tech	2	.345	.119	Tech	2	.458	.210
6	Sub	2	.367	.134				

N = 65

Variable Classes 1, 2, and 3

TECHNOLOGY AND LEADERSHIP STYLE VARIABLES
(Total Sample)

Step Number	Total Sample Run #3, a' = 0.05				Total Sample Run #4, a' = 0.001			
	Variable Entered	Class (Forced)	Multiple R	R^2	Variable Entered	Class (Free)	Multiple R	R^2
1	TRO	4	.161	.026	LDE	5	.260	.067
2	TTO	4	.214	.046	LSE	5	.322	.104
3	LDE	5	.309	.095	LDI	5	.350	.122
4	LDI	5	.329	.108	LRI	5	.375	.140
5					TTO	4	.397	.158

N = 65

Variable Classes 4 and 5

ership style variables were clearly dominant in explaining with R = 0.397 and a' = 0.001.

All five classes of variables were allowed to enter ly in the fifth run as shown in Table IX. Twelve variables red in all; the final three were leadership style variables ere the first (dedicated effective), third (dedicated ineffive), and sixth (separated effective). The second (LSD) fourth (FCOD) variables were organization variables. The h variable was "age" (personal background) and the ninth "task orientation" (technology). Job characteristics red seventh (technical extent of job) and eighth (subortes reporting directly). The value of R was 0.593 and a' 0.001.

Second Hypothesis

A manager's perception of the effectiveness of his own nization, according to the second hypothesis, has no effect he relationship between his perception of an unspecified effective organization and the five classes of variables ined in Table VI. The computer runs made with the entire le of 65 managers and used to test the first hypothesis also be used in testing the second hypothesis. In additior uter runs were made with each segment of the split sample: e perceiving their own organization to be either effective 34) or less effective (N = 31).

Table X compares the stepwise regression runs for the re sample of 65 managers which used variable classes 1,

TABLE IX

PERSONAL, JOB, ORGANIZATION, TECHNOLOGY, AND LEADERSHIP STYLE VARIABLES (Total Sample)

p er	Total Sample Run #5, N = 65, a' = 0.001			
	Variable Entered	Class (Free)	Multiple R	R^2
	LDE	5	.260	.067
	LSD	3	.329	.108
	LDI	5	.392	.154
	FCOD	3	.428	.183
	Age	1	.470	.221
	LSE	5	.498	.248
	Tech	2	.515	.265
	Sub	2	.534	.285
	TTO	4	.548	.300
	LSI	5	.561	.315
	LRI	5	.577	.333
	LRE	5	.593	.351

Variable Classes 1, 2, 3, 4, and 5

PERSONAL, JOB, AND ORGANIZATION VARIABLES
(Forced Entry)

Step Number	Total Sample Run #1, N = 65, a' = 0.05				Effective Run #6, N = 34, a' = 0.03			
	Variable Entered	Class (Forced)	Multiple R	R^2	Variable Entered	Class (Forced)	Multiple R	R^2
1	Age	1	.207	.043	Age	1	.444	.197
2	Engg	1	.251	.063	Engg	1	.473	.224
3	Skill	2	.290	.084	Skill	2	.518	.269
4	Rout	2	.320	.103	Sub	2	.553	.305
5	Tech	2	.345	.119	Mgr	2	.574	.330
6	Sub	2	.367	.134	Tech	2	.601	.362
7					Rout	2	.625	.391
8					Other	3	.626	.392
9					FOD	3	.650	.422
10					ED	3	.726	.527
11					SAD	3	.741	.549

Variable Classes 1, 2, and 3

nd 3 forced to enter in that order as opposed to these variables for the sample of 34 managers which perceived r own organizations to be effective. Both personal back- nd variables and all job characteristic variables except the "managerial extent of the job" entered to explain with an R of 0.367 and an a' of 0.05 for the entire sam- of managers. Entry of eleven variables was forced for sample having an effective perception of their organiza- s: all personal background and job characteristics ables and four directorate variables ("other," FOD, ED, SAD) appeared and yielded R = 0.741 with a' = 0.03. The le of 31 managers which perceived their own organization e less effective yielded data with an F - level insuffi- t for computation with a meaningful level of significance .

Variable classes 1, 2, and 3 were allowed to enter freely he three runs (N = 65, N = 34, and N = 31) shown in Table For the entire sample, organization variables entered t (LSD) and third (FCOD), the personal variable "age" red second, and the job characteristics variables "subor- tes reporting directly" and "technical extent of the job" red last. R was 0.458 with a' = 0.001. For the sample anagers having an effective perception of their ogranizа- , the same variables entered with the following two ptions: the organization variable "FOD" replaced "LSD," the job characteristics variable "managerial extent of the was added. R = 0.672 with a' = 0.001. For the sample of

PERSONAL, JOB, AND ORGANIZATION VARIABLES
(Free Entry)

Step Number	Total Sample Run #2, N = 65, a' = 0.001				Effective Run #7, N = 34, a' = 0.001				Less Effective Run #12, N = 31, a' = 0.05			
	Variable Entered	Class (Free)	Multiple R	R^2	Variable Entered	Class (Free)	Multiple R	R^2	Variable Entered	Class (Free)	Multiple R	R^2
1	LSD	3	.251	.063	Age	1	.444	.197	LSD	3	.300	.090
2	Age	1	.331	.109	FCOD	3	.542	.294	Tech	2	.380	.144
3	FCOD	3	.388	.150	Sub	2	.595	.355	Sub	2	.427	.183
4	Sub	2	.439	.184	FOD	3	.625	.390				
5	Tech	2	.458	.210	Mgr	2	.653	.427				
6					Tech	2	.672	.452				

Variable Classes 1, 2, and 3

gers having a less effective perception of their organi-
on, the directorate "LSD" entered first while "technical
it of the job" and "subordinates reporting directly" be-
the only two variables to enter in all three situations.
).427 with a' = 0.05.

Variable classes 4 and 5 were forced to enter in that
r in the three runs N = 65, N = 34, and N = 31. The
er two provided data with an F - level insufficient for
itation with a meaningful a', so a comparison of these
e runs was not possible.

Variable classes 4 and 5 were allowed to enter freely
ie three runs (N = 65, N = 34, and N = 31) shown in
e XII. For the entire sample of managers, leadership
e variables were the first four to enter (dedicated
ctive and ineffective, separated effective, and related
fective). "Technology task orientation" entered last.
s 0.397 with a' = 0.001. For the sample of managers
ig an effective perception of their organization, both
iology variables entered first and were followed by two
ership variables (related effective and dedicated effec-
). R = 0.448 with a' = 0.05. Only the leadership
ables "dedicated effective" and "separated effective"
red for the sample of managers having a less effective
eption of their organization. R = 0.544 with a' = 0.001.
ould be noted that the leadership style variables were
iant in explaining EALL for both the entire sample of
gers and the sample having a less effective perception

TECHNOLOGY AND LEADERSHIP STYLE VARIABLES
(Free Entry)

	Total Sample Run #4, N = 65, a' = 0.001				Effective Run #9, N = 34, a' = 0.05				Less Effective Run #14, N = 31, a' = 0.001			
Step Number	Variable Entered	Class (Free)	Multiple R	R^2	Variable Entered	Class (Free)	Multiple R	R^2	Variable Entered	Class (Free)	Multiple R	R^2
1	LDE	5	.260	.067	TTO	4	.312	.097	LDE	5	.427	.182
2	LSE	5	.322	.104	TRO	4	.355	.126	LSE	5	.544	.296
3	LDI	5	.350	.122	LRE	5	.396	.156				
4	LRI	5	.375	.140	LDE	5	.448	.201				
5	TTO	4	.397	.158								

Variable Classes 4 and 5

heir organization, while the technology variables best
ained EALL for the sample having an effective perception
heir organization.

Finally, all five classes of variables were allowed to
r freely in the three runs (N = 65, N = 34, and N = 31)
n in Table XIII. For the entire sample of managers,
ve variables entered in all; the final three were lead-
ip style variables as were the first (dedicated effective),
d (dedicated ineffective), and sixth (separated effective).
second (LSD) and fourth (FCOD) variables were organization
ables. The fifth variable was "age" (personal background)
the ninth was "task orientation (technology). Job charac-
stics entered seventh (technical extent of job) and eighth
ordinates reporting directly). The value of R was 0.593
a' was 0.001. For the sample of managers having an effec-
perception of their organization, the personal variable
" entered first and was joined by the directorates "FCOD,"
" and "other". "Leadership separated effective" and the
variable "subordinates reporting directly" entered third
fourth. R was 0.692 with a' = 0.001. For the sample of
gers having a less effective perception of their organi-
on, the leadership variables "dedicated effective" and
arated effective" entered first and the job variables
tine subordinate tasks" entered last. R = 0.571 with
0.001.

(Free Entry)

	Total Sample Run #5, N = 65, a' = 0.001				Effective Run #10, N = 34, a' = 0.001				Less Effective Run #15, N = 31, a' = 0.001			
Step Number	Variable Entered	Class (Free)	Multiple R	R^2	Variable Entered	Class (Free)	Multiple R	R^2	Variable Entered	Class (Free)	Multiple R	R^2
1	LDE	5	.260	.067	Age	1	.444	.197	LDE	5	.427	.182
2	LSD	3	.329	.108	FCOD	3	.542	.294	LSE	5	.544	.296
3	LDI	5	.392	.154	LSE	5	.599	.359	Rout	2	.571	.326
4	FCOD	3	.428	.183	Sub	2	.640	.409				
5	Age	1	.470	.221	ED	3	.663	.439				
6	LSE	5	.498	.248	Other	3	.692	.479				
7	Tech	2	.515	.265								
8	Sub	2	.534	.285								
9	TTO	4	.548	.300								
10	LSI	5	.561	.315								
11	LRI	5	.577	.333								
12	LRE	5	.593	.351								

Variable Classes 1, 2, 3, 4, and 5

Summary

It was found in testing the first hypothesis that each
:he five classes of variables influences a manager's opinion
/hat an effective organization should be like, with his
lership style and his organization playing the largest roles

In testing the second hypothesis, it was discovered that
relationship between a manager's perception of an unspeci-
l but effective organization and the five classes of vari-
:s is influenced by the manager's perception of the
:ctiveness of his own organization. For those 34 perceiving
:r own organization to be effective, this relationship grew
)nger for each of the five variable classes (especially per-
:l background, job characteristics, and organization). For
:e 31 perceiving their own organization to be less effective
; relationship grew stronger for only the leadership style
iables and weaker for the rest.

CHAPTER V

IMPLICATIONS FOR MANAGEMENT AND CONCLUSIONS

No two organizations are alike. Just as people are dif-
ent, so too do organizations have different needs, goals,
. ambitions. It is therefore not difficult to understand
.t different organizations use different standards to mea-
·e effectiveness. While maintaining a sociable and harmo-
)us organization might be of utmost importance to one,
)ther might consider these two qualities worthless and
ıce great value on meeting deadlines and rapidly adapting
change.

Effectiveness standards also vary for positions within
organization; a personnel manager obviously has duties
ich differ in nature from a technical contract monitor.
is important for each member to correctly identify what
s goals should be to achieve effectiveness for his position
thin the organization.

First Hypothesis

The results of this study should be immediately useful
managers. First, a manager should realize that, for bette
· worse, each of the five classes of variables (his personal
ıckground, characteristics of his job, his organization, his

technology, and his leadership style) influences his
nion of what an effective organization should be like,
h perhaps his leadership style and his organization playing
largest roles. This supports the theory emphasizing the
ortance of a manager's situation and identifies which ele-
ts of his situation are most significant. An awareness of
forces shaping his opinion will better enable him to keep
one (perhaps his personal background and any built-in
judices he may have) from overwhelming the others (an aware
s of goals important to his own organization, for example)
realistically setting effectiveness standards for his par-
ular situation.

Second, a manager should realize that both his superiors
l his subordinates are also influenced by the five classes
variables in forming their perception of organizational
fectiveness; he should recognize that their perceptions may
different from his own and he should act accordingly. If
nanager is able to observe characteristics of his superior's
and his superior's leadership style, the manager will be
a better position to set effectiveness standards for him-
lf in a manner satisfactory to his superior. Similarly,
owledge of a subordinate's personal background and job tech-
logy could help a manager explain why the subordinate has a
sconception of which goals are important to achieve effec-
veness.

Finally, it is often extremely important for an organi-
tion to project an aura of effectiveness to forces of its

ternal environment if it is to remain successful in the ture. For example, retention of Congressional funding and blic support depends to a large degree upon the ability of SA to illustrate: (1) the benefits to be derived from the ace program, and hence (2) NASA's effectiveness in serving n.

Second Hypothesis

Another important result of the study occurred when the mple of 65 managers was polarized into two groups according how they perceived the effectiveness of their own organi- tion.

The relationship between their perception of an effec- ve organization and all five classes of variables (especial rsonal background, job characteristics, and organization) b me much stronger for the sample of 34 managers. They per- ived their organization to be effective and so used each of e five facets of their own situation in building a model of w an effective organization should be.

The relationship between their perception of an effectiv ganization and four of the five classes of variables grew aker for the sample of 31 managers. They perceived their ganization to be effective to only a moderate extent or les d so did not relate much of their own situation to how an fective organization should be. While these managers be- eved their organization to be less effective, they neverthe ss thought their own style of leadership was the best possi

r their situation and so used their leadership style as
e basis for judging how an effective organization should
(as evidenced by the much stronger relationship between
adership style and perception of an effective organization
r these managers). If their own leadership style was re-
ted, for instance, they thought the implementation of the
lated style throughout an organization as a whole would
ke the organization more effective. It is possible that
nagers who perceive their organization to be effective to
ly a moderate extent or less are largely insensitive to
e demands created by the situation and depend too heavily
on their own leadership style. Such a manager would almost
rtainly himself be less effective and would be unable to
ntribute to the effectiveness of his organization in a com-
etely positive way.

Thus, perception of an effective organization is strongly
lated to: (1) the leadership style of all managers and (2)
e personal background, job characteristics, organization,
d job technology of only those managers who perceive their
n organization to be effective.

The present study could serve as a valuable basis for
ture research. More accurate determination of values for
ch of the five independent variable classes and improved
alysis techniques would be useful in developing a compre-
nsive model. The eventual goal would be the development of
model with which any manager's situation could be realistica

praised and his perception of organizational effectiveness curately predicted.

An aggregate value of perceived organizational effec-veness was used in this study. However, it was determined om Collins' work that there are five main components of rceived organizational effectiveness, namely: (1) momentum,) organizational credibility, (3) situational reaction to ange, (4) task orientation of supervision, and (5) essen-ality of the organization's role. Future research could be nducted to determine how a manager's leadership style, tech-logy, personal background, and job and organizational aracteristics affects each of the five components of per-ived organizational effectiveness on an individual basis. is would increase the sensitivity of the analysis and add aning to empirically-obtained predictions.

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APPENDIXES

APPENDIX A

THE QUESTIONNAIRE

SECTION I

PERSONAL AND JOB DATA

)NAL

)heck highest degree attained:

____High School Diploma
____Bachelor's Degree
____Some Graduate Training
____Master's Degree
____Doctorate Degree
____Post Doctoral Degree

heck area of highest degree:

____Engineering
____Scientific
____Business
____Technical (Non-Engineering)
____Arts
____Others (specify)_____

ge _____

)tal full-time work experience _____years

)ngth of time in present job _____years

tal number of your subordinates, if any _____.

Number of your subordinates who report to you directly_____

Number of your subordinates reporting directly to you who are aides or assistants

_____

ı have no subordinates, answer only the following questions which perta
ı.

›r your subordinates to properly perform their tasks, what level of
lucation would you say is required?

___High School Diploma

___Some College

___Bachelor's Degree

_____Graduate Degree

_____Other, specify _____

'or your subordinates to properly perform their tasks, what level of
skill would you say is required?

1	2	3	4	5	6	7
fuch			Moderate amount			Little

Would you describe your position as being (a) or (b)?

____a. Advisory in nature; one who provides information essential to those within the organization who make operational decision

____b. Directly responsible for making operational decisions for the organization.

In each of the following three rows, please circle the number which is
ıost representative of your duties:

1	2	3	4	5	6	7
›urely Managerial			Some Managerial			Not at all Managerial

1	2	3	4	5	6	7
›urely 'echnical			Some Technical			Not at all Technical

1	2	3	4	5	6	7
Extensive Contact with other JSC Organizations			Some Contact			No Contac

o what extent are your subordinates required to perform in a managerial apacity? (Your estimate may need to take account of the fact that some f your subordinates may spend more time in a managerial capacity than thers.)

_____% total man-hours

o what extent are your subordinates required to perform the following inds of tasks:

routine _____% total man-hours

non-routine _____% total man-hours

100 % man-hours total

?o what extent are your subordinates required to interact with persons in other organizational units?

_____% total man-hours

How would you rate the overall effectiveness of your present JSC Divisi (the one in which you work)? Please circle the number which is most representative of your opinion:

1	2	3	4	5	6	7	8
Extremely Effective			Moderately Effective				Not Very Effective

DIRECTIONS FOR RATING AN EFFECTIVE ORGANIZATION

Think of the most effective JSC Division with which you are familiar. Visualize the organizational structure, the people, the work, the physical arrangements, and so forth. Then rate that organization on each of the following scales:

Please make only one mark per scale and mark each scale.

ıant Organization	___:___:___:___:___:___:___:___	A Harmonious Organization
ınt Organization	___:___:___:___:___:___:___:___	A Progressive Organizatior
ːiable Organization	___:___:___:___:___:___:___:___	A Sociable Organization
ːient Interchange of Info	___:___:___:___:___:___:___:___	Sufficient Interchange of
ssful in Meeting Long erm Goals	___:___:___:___:___:___:___:___	Successful in Meeting Long Term Goals
ıized Use of People esources	___:___:___:___:___:___:___:___	Organized Use of People Resources
fluential Organization	___:___:___:___:___:___:___:___	An Influential Organizati
able Organization	___:___:___:___:___:___:___:___	A Disreputable Organizati
sful in Reaching Short erm Goals	___:___:___:___:___:___:___:___	Unsuccessful in Meeting S Term Goals
sful in Meeting Deadlines	___:___:___:___:___:___:___:___	Unsuccessful in Meeting D
ess at Adapting to Change	___:___:___:___:___:___:___:___	Ineptness at Adapting to
ıistic Feeling About NASA Environment	___:___:___:___:___:___:___:___	Optimistic Feeling About NASA Environment
Disciplined Organization	___:___:___:___:___:___:___:___	Single-Disciplined Organi
ːssive View of Change	___:___:___:___:___:___:___:___	Regressive View of Change
ıge of Understandable Info	___:___:___:___:___:___:___:___	Exchange of Ambiguous Ini
Less Technical Supervision	___:___:___:___:___:___:___:___	Valuable Technical Super
ːcure Organization	___:___:___:___:___:___:___:___	A Famous Organization
important Organization	___:___:___:___:___:___:___:___	An Important Organizatio
sential Organization	___:___:___:___:___:___:___:___	A Non-Essential Organiza

APPENDIX A (Continued)

SECTION III

TECHNOLOGY INSTRUCTIONS

The purpose of this section of the questionnaire is to help you find most preferred job orientation, as determined by the technology, for a ger in your position.

The Technology Score Sheet has 36 boxes numbered from 1 to 36. These s are used to record your choice of each pair of questions, also ered from 1 to 36 in the questionnaire.

Look at the 36 pairs of statements in the questionnaire. If you think first statement of a pair is the one that best applies to you, put an in the appropriate box. If you think the second statement is the one that applies to you, put a "B" in the appropriate box. When you have finished the boxes will have either an "A" or a "B" in them. Notice that the boxes numbered in sequence across the page; therefore, you should fill in the line first, the second line next and so on.

To decide which statement best applies, ask yourself: "Of the two statements given, which best describes the situation as it really is on the job I have?" It may be helpful, in difficult cases, to answer as someone would really knew and understood your present job situation. Some statements may find a little ambiguous, sometimes both will apply, often, neither seem to apply. However, in every case pick the one statement which fits

SECTION III

TECHNOLOGY

SCORE SHEET

	1	2	3
4		5	6
7	8		9
10	11	12	
	13	14	15
16		17	18
19	20		21
22	23	24	
	25	26	27
28		29	30
31	32		33
34	35	36	

Fill in each of the 36 numbered squares with either an "A" or a depending upon your choice from pair of statements 1 through 36 the "Technology Questions." Then. . . . .

Step 1: Find values for each letter A through L. A through L represent the number of A's in e horizontal row.

Step 2: Find values for each letter M through P. M through P represent the number of B's in e vertical row.

Step 3: Find values for Q,R,S,

Q = A + E + I
R = B + F + J
S = C + G + K
T = D + H + L

Step 4: Find values for U,V,W,

U = M + Q
V = N + R
W = O + S
X = P + T

Step 5: Check to make certain
U + V + W + X = 36

Step 6: Record your values for U,V,W, and X on the "Score Repor sheet.

M	N	O	P
Q	R	S	T
U	V	W	X

SECTION III

TECHNOLOGY QUESTIONS

A. Each subordinate has discretion over his own effective standards.

B. The subordinate's performance is measurable, and the impact of remedial actions taken by the manager can be evaluated.

A. The subordinates' tasks are simple to perform.

B. The position makes high skill or judgment demands on the individual subordinate.

A. The subordinates' work and work method follow established procedures.

B. The subordinates must talk with each other to complete their tasks.

A. The subordinates frequently need to be given directions.

B. The subordinates are required to think rather than to act.

A. Unplanned and unanticipated events might occur which require corrective action by the manager.

B. The position makes high skill or judgment demands on the individual subordinate.

A. The subordinates frequently need to be given directions.

B. The subordinates must talk with each other to complete their tasks.

A. Each subordinate can select the method, tools, or approach he wishes to use.

B. The subordinates' work and work method follow established procedures.

A. Subordinates are required to be personally committed to their own individual tasks to achieve effectiveness standards.

B. Unplanned and unanticipated events might occur which require corrective action by the manager.

A. The position makes high skill or judgment demands on the individual subordinates.

B. The subordinates must talk with each other to complete their tasks.

A. The manager must talk with the subordinates as a group for them to complete their tasks.

B. The subordinates' tasks are simple to perform.

A. The subordinates must depend on each other in meeting their own effectiveness standards.

B. The subordinates frequently need to be given directions.

A. More than one effective solution is possible; the relative effectiveness of these solutions is difficult to measure but improved by interact

B. Each subordinate can select the method, tools, or approach he wishes to use.

A. Each subordinate has discretion over his own effectiveness standards.

B. Unplanned and unanticipated events might occur which require corrective action by the manager.

A. The subordinates' work and work method follow established procedures.

B. Each subordinate must develop new methods and ideas to perform his own work.

A. The subordinates' tasks are simple to perform.

B. The subordinates must depend on each other in meeting their own effectiveness standards.

A. The subordinate's performance is measurable, and the impact of remedial actions taken by the manager can be evaluated.

B. The subordinates' work is in and of itself interesting, motivating, or attractive.

A. The subordinates know less about the task than does the manager.

B. Each subordinate can select the method, tools, or approach he wishes to use.

A. Unplanned and unanticipated events might occur which require corrective action by the manager.

B. The subordinates must depend on each other in meeting their own effectiveness standards.

A. The position makes high skill or judgment demands on the individual subordinates.

B. The subordinates' work and work method follow established procedures.

A. Substandard work by an individual subordinate is not immediately detected.

B. The subordinate's performance is measurable, and the impact of remedial actions taken by the manager can be evaluated.

. A. Each Subordinate can select the method, tools, or approach he wishes to use.

B. The manager must talk with the subordinates as a group for them to complete their tasks.

. A. Subordinates as a group set their own pace or level of involvement.

B. The subordinates' work and work method follow established procedures.

. A. More than one effective solution is possible; the relative effectiven of these solutions is difficult to measure but improved by interaction

B. The subordinate's performance is measurable, and the impact of remedia actions taken by the manager can be evaluated.

. A. The subordinates must depend on each other is meeting their own effectiveness standards.

B. Substandard work by an individual subordinate is not immediately detected.

. A. The subordinates' work is in and of itself interesting, motivating, or attractive.

B. The subordinates frequently need to be given directions.

. A. The subordinates' tasks are simple to perform.

B. Each subordinate can select the methods, tools, or approach he wishes to use.

. A. Each subordinate has discretion over his own effectiveness standards.

B. The subordinates must depend on each other in meeting their own effectiveness standards.

. A. The subordinates know less about the task than does the manager.

B. The subordinates are required to think rather than to act.

. A. The subordinates frequently need to be given directions.

B. Each subordinate must develop new methods and ideas to perform his own work.

. A. The subordinates know less about the task than does the manager.

B. Subordinates as a group set their own pace or level of involvement.

A. Each subordinate must develop new methods and ideas to perform his own work.

B. The subordinates' tasks are simple to perform.

A. The position makes high skill or judgment demands on the individual subordinate.

B. The subordinates frequently need to be given directions.

A. Subordinates are required to be personally committed to their own individual tasks to achieve effectiveness standards.

B. The subordinates must depend on each other in meeting their own effectiveness standards.

A. More than one effective solution is possible; the relative effectivene of these solutions is difficult to measure but improved by interaction

B. Each subordinate has discretion over his own effectiveness standards.

A. The manager must talk with the subordinates as a group for them to com their tasks.

B. The subordinates know less about the task than does the manager.

A. Subordinates as a group set their own pace or level of involvement.

B. Each subordinate must develop new methods and ideas to perform his own work.

SCORE REPORT

SECTION III

HNOLOGY SCORES

Enter below the 4 values U,V,W, and X (they must total 36):

U	V	W	X
_____	_____	_____	_____

SECTION IV

DERSHIP SCORES

Enter below the 8 values from line 5 on the scoresheet (they must al 64):

	B	C	D	E	F	G	H
___	_____	_____	_____	_____	_____	_____	_____

SECTION III

INSTRUCTIONS FOR THE "TECHNOLOGY RESULTS" SHEET

p 1: Transfer the values for U,V,W, and X from the bottom of the "Technology Score Sheet" to the top of the "Technology Results" page. These values will henceforth be referred to as the styles S', D', R', and I', respectively.

p 2: List each letter S', D', R', and/or I' as being "dominant" if its corresponding value is in the range 13 through 18. List each letter S', D', R', and/or I' as being "supporting" if its corresponding value is in the range 7 through 12.

Note: The values of S', D', R', and I' must all sum to 36.

p 3: Find values for TO and RO.

$$TO = D' + I' - 6$$

$$RO = R' + I' - 6$$

p 4: Show the coordinates of the point (TO,RO) on the graph at the bottom of the page. Indicate this point with an "X".

p 5: For each dominant style, draw a small circle in the corresponding quadrant of the graph in the corner of the quadrant opposite the center point (12,12).

For each supporting style, draw a small circle in the correspondi quadrant of the graph in the corner of the quadrant nearest the center point (12,12).

p 6: Connect all small circles with an appropriate larger figure.

s entire procedure, as well as a few examples, will be presented by the person conducting the questionnaire.

SECTION III

TECHNOLOGY RESULTS

S' = U = _____

D' = V = _____

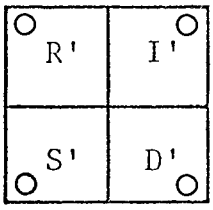
R' = W = _____

I' = X = _____

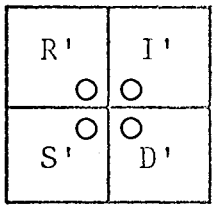
Note: S' + D' + R' + I' = 36

Dominant Styles (13-18): _____

Supporting Styles (7-12): _____



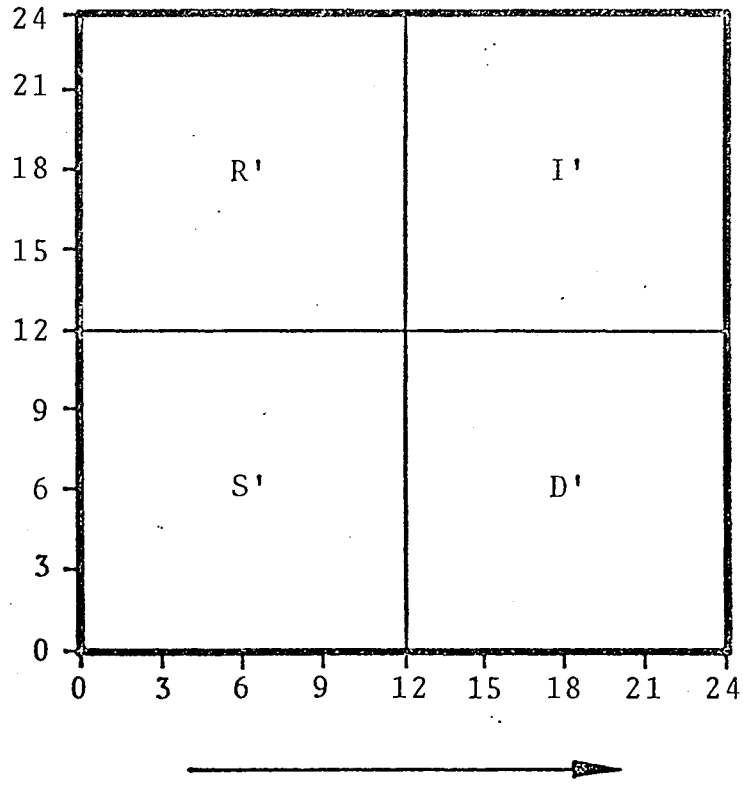
Sample Graph
all 4 styles dominant)



Sample Graph
(all 4 styles supporting)

TO = D' + I' - 6 = _____

RO = R' + I' - 6 = _____



Graph Dominant and Support Styles and Coordinates of Point (TO,RO)

APPENDIX B

PERCEIVED EFFECTIVENESS SCALE DIRECTION

	Left Side of Page	
(1)	8	
(2)	8	
(3)	8	
(4)	8	Factor 1, Momentum
(5)	8	
(6)	8	
(7)	8	
(8)	1	Factor 2, Organizational
(9)	1	Credibility
(10)	1	
(11)	1	
(12)	8	Factor 3, Situational Reaction
(13)	1	to Change
(14)	1	
(15)	1	
(16)	8	Factor 4, Task Orientation
(17)	8	of Supervision
(18)	8	Factor 5, Essentiality of the
(19)	1	Organization's Role

APPENDIX C

SITUATIONAL STYLE DESCRIPTORS

Related

(1) The position makes high skill or judgement demands on the individual subordinate.

(2) Subordinates are required to be personally committed to their own individual tasks to achieve effectiveness standards.

(3) Each subordinate can select the method, tools, or approach he wishes to use.

(4) Substandard work by an individual subordinate is not immediately detected.

(5) Each subordinate must develop new methods and ideas to perform his own work.

Integrated

(1) The subordinates must talk with each other to complete their tasks.

(2) The subordinates must depend on each other in meeting their own effectiveness standards.

(3) The manager must talk with the subordinates as a group for them to complete their tasks.

(4) More than one effective solution is possible; the relative effectiveness of these solutions is difficult to measure but improved by interaction.

(5) Subordinates as a group set their own pace or level of involvement.

APPENDIX C (Continued)

Separated

(1) The subordinates' work and work method follow established procedures.

(2) Each subordinate has discretion over his own effectiveness standards.

(3) The subordinates' tasks are simple to perform.

(4) The subordinates are required to think rather than to act.

(5) The subordinates' work is in and of itself interesting, motivating, or attractive.

Dedicated

(1) The subordinates know less about the task than does the manager.

(2) Unplanned and unanticipated events might occur which require corrective action by the manager.

(3) The subordinates frequently need to be given directions.

(4) The subordinate's performance is measurable, and the impact of remedial actions taken by the manager can be evaluated.

APPENDIX D

PAIRED SITUATIONAL STYLE DESCRIPTORS

(9)	I1 - R1		(3)	I1 - S1		(6)	I1 - D3	
(33)	I2 - R2		(27)	I2 - S2		(11)	I2 - D3	
(21)	I3 - R3		(10)	I3 - S3		(35)	I3 - D1	
(12)	I4 - R3		(34)	I4 - S2		(23)	I4 - D4	
(36)	I5 - R5		(22)	I5 - S1		(30)	I5 - D1	
(24)	I2 - R4		(15)	I2 - S3		(18)	I2 - D2	
(19)	R1 - S1		(5)	R1 - D2		(1)	S2 - D4	
(7)	R3 - S1		(8)	R2 - D2		(4)	S4 - D3	
(14)	R5 - S1		(17)	R3 - D1		(16)	S5 - D4	
(2)	R1 - S3		(20)	R4 - D4		(13)	S2 - D2	
(26)	R3 - S3		(29)	R5 - D3		(28)	S4 - D1	
(31)	R5 - S3		(32)	R1 - D3		(25)	S5 - D3	

	A	B		A	B		A	B
(1)	S2	- D4	(13)	S2	- D2	(25)	S5	- D3
(2)	S3	- R1	(14)	S1	- R5	(26)	S3	- R3
(3)	S1	- I1	(15)	S3	- I2	(27)	S2	- I2
(4)	D3	- S4	(16)	D4	- S5	(28)	D1	- S4
(5)	D2	- R1	(17)	D1	- R3	(29)	D3	- R5
(6)	D3	- I1	(18)	D2	- I2	(30)	D1	- I5
(7)	R3	- S1	(19)	R1	- S1	(31)	R5	- S3
(8)	R2	- D2	(20)	R4	- D4	(32)	R1	- D3
(9)	R1	- I1	(21)	R3	- I3	(33)	R2	- I2
(10)	I3	- S3	(22)	I5	- S1	(34)	I4	- S2
(11)	I2	- D3	(23)	I4	- D4	(35)	I3	- D1
(12)	I4	- R3	(24)	I2	- R4	(36)	I5	- R5

APPENDIX E

KEY TO CONSTRUCTION OF TECHNOLOGY INSTRUMENT

Number of Statement		Pair	Style	A		B		Style
				High TO	High RO	High TO	High RO	
1	13	25		-	-	X		D
2	14	26	S	-	-		X	R
3	15	27		-	-	X	X	I
4	16	28		X		-	-	S
5	17	29	D	X			X	R
6	18	30		X		X	X	I
7	19	31			X	-	-	S
8	20	32	R		X	X		D
9	21	33			X	X	X	I
10	22	34		X	X	-	-	S
11	23	35	I	X	X	X		D
12	24	36		X	X		X	R

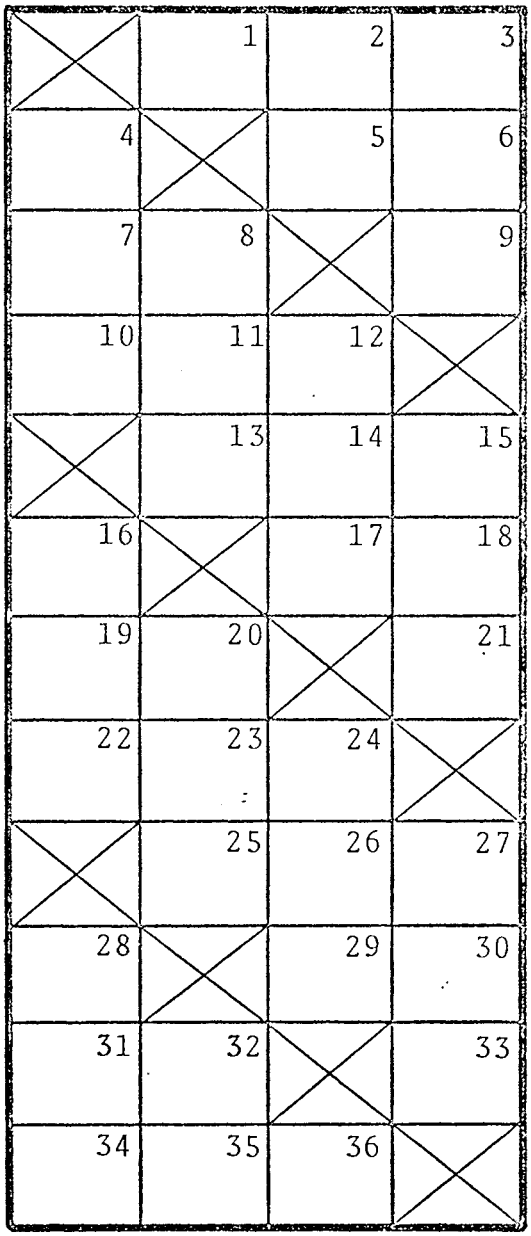
Style Key

S = Separated
D = Dedicated
R = Related
I = Integrated

SECTION III

TECHNOLOGY

SCORE SHEET



	1	2	3
4		5	6
7	8		9
10	11	12	
	13	14	15
16		17	18
19	20		21
22	23	24	
	25	26	27
28		29	30
31	32		33
34	35	36	

Fill in each of the 36 numbered squares with either an "A" or a depending upon your choice from pair of statements 1 through 36 the "Technology Questions." Then. . . . .

Step 1: Find values for each letter A through L. A through L represent the number of A's in e horizontal row.

Step 2: Find values for each letter M through P. M through P represent the number of B's in e vertical row.

Step 3: Find values for Q,R,S,

Q = A + E + I
R = B + F + J
S = C + G + K
T = D + H + L

Step 4: Find values for U,V,W,

U = M + Q
V = N + R
W = O + S
X = P + T

Step 5: Check to make certain
U + V + W + X = 36

Step 6: Record your values for U,V,W, and X on the "Score Repor sheet.

M	N	O	P
Q	R	S	T
U	V	W	X

APPENDIX G

SECTION III

TECHNOLOGY RESULTS

S' = U = 13

D' = V = 10

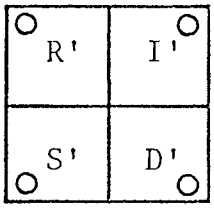
R' = W = 6

I' = X = 7

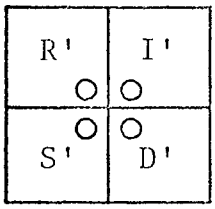
Note: S' + D' + R' + I' = 36

Dominant Styles (13-18): S'

Supporting Styles (7-12): D', I'



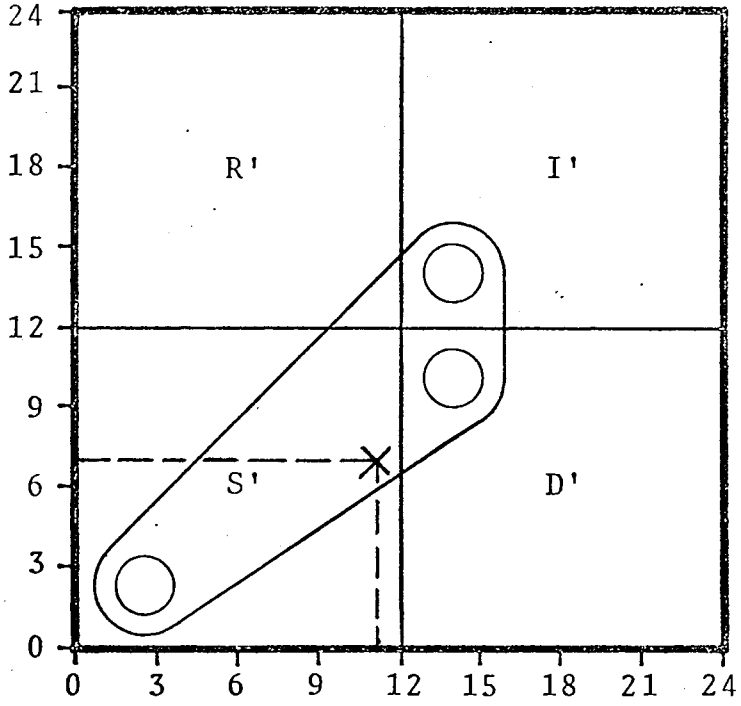
Sample Graph
(all 4 styles dominant)



Sample Graph
(all 4 styles supporting)

TO = D' + I' - 6 = 10 + 7 - 6 = 11

RO = R' + I' - 6 = 6 + 7 - 6 = 7



Graph Dominant and Support Styles and Coordinates of Point (TO,RO)

SECTION III

TECHNOLOGY RESULTS

S' = U = 18

D' = V = 12

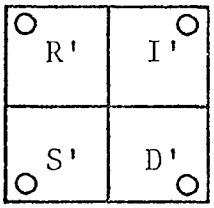
R' = W = 0

I' = X = 6

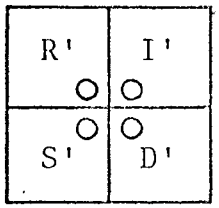
Note: S' + D' + R' + I' = 36

Dominant Styles (13-18): S'

Supporting Styles (7-12): D'



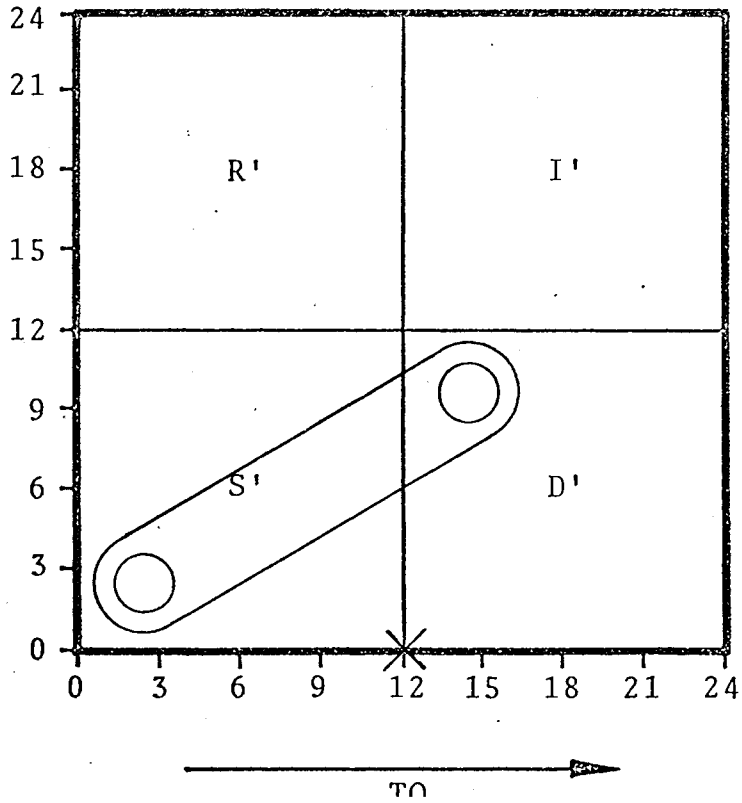
Sample Graph
(all 4 styles dominant)



Sample Graph
(all 4 styles supporting)

TO = D' + I' - 6 = 12 + 6 - 6 = 12

RO = R' + I' - 6 = 0 + 6 - 6 = 0



Graph Dominant and Support Styles and Coordinates of Point (TO,RO)

SECTION III

TECHNOLOGY RESULTS

S' = U = 10

D' = V = 8

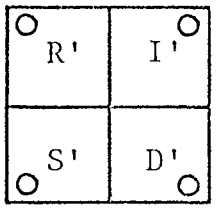
R' = W = 10

I' = X = 8

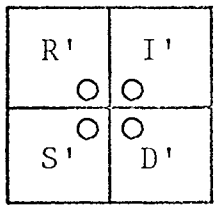
Note: S' + D' + R' + I' = 36

Dominant Styles (13-18): —

Supporting Styles (7-12): S', D', R', I'



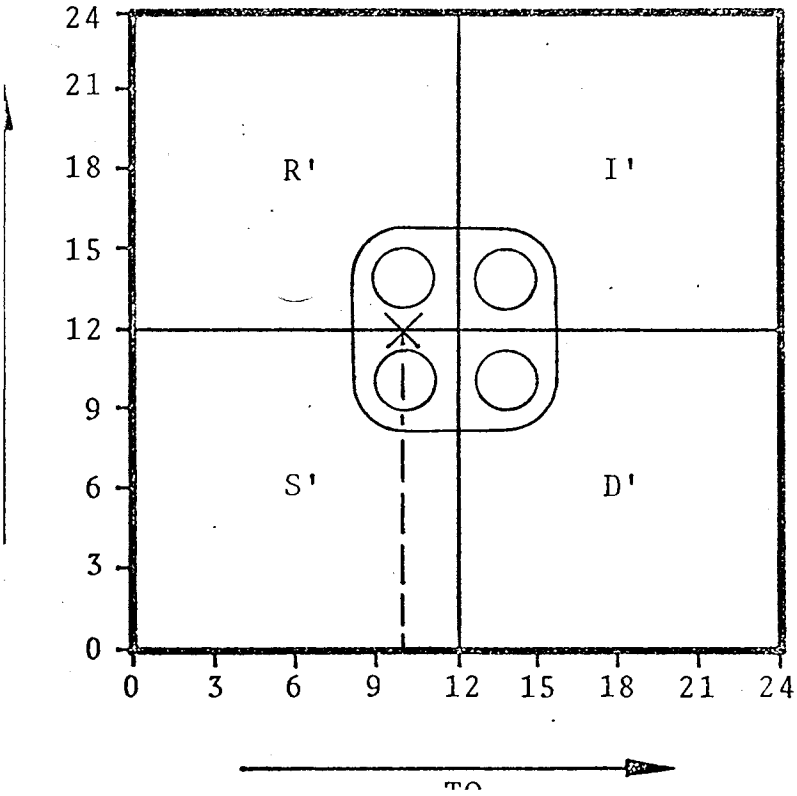
Sample Graph
(all 4 styles dominant)



Sample Graph
(all 4 styles supporting)

TO = D' + I' - 6 = 8+8-6 = 10

RO = R' + I' - 6 = 10+8-6 = 12



Graph Dominant and Suppor Styles and Coordinates of Point (TO,RO)

VITA

Michael Eugene Moore

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ɜsis: KEY INFLUENCES ON MANAGERIAL PERCEPTION OF ORGANIZATIONAL EFFECTIVENESS

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ɔgraphical:

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