An Investigation of the Relationship between Emergent Leadership and Several Potential Predictor Variables in an Academic Setting

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AN INVESTIGATION OF THE RELATIONSHIP BETWEEN EMERGENT LEADERSHIP AND SEVERAL POTENTIAL PREDICTOR VARIABLES IN AN ACADEMIC SETTING

by

Melvin James Tessin

A Dissertation Submitted to the Faculty of The Graduate College in partial fulfillment of the Degree of Doctor of Education

Western Michigan University Kalamazoo, Michigan August 1972
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ACKNOWLEDGEMENTS

During the past five years, I have had the unique opportunity to continue my education while working with many respected persons associated with Western Michigan University. A great number of wonderful friendships have developed with students and colleagues.

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To my Doctoral Committee: Dr. James A. Davenport, who had the fortitude to work with me, and for me, while serving as my committee chairman and advisor; Dr. E. Jack Asher, who replaced Dr. William D. Coats on my committee the last several months, and more than generously gave of his time and attention to help me complete my dissertation; Dr. Booker, my committeeman, friend, and colleague.

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To my wife, Liz, and sons Tim and Todd, who gave generously of love, sacrifice, and faith that a dream could be realized, my appreciation can not be put in words.

Melvin James Tessin

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CHAPTER I

THE PROBLEM AND REVIEW OF RESEARCH

Introduction

Understanding the bases for effective leadership behavior in organizations has been a challenge for behavioral science researchers. Theories have been developed, hypotheses tested, and the results published extensively in the past 50 years. In spite of this effort, research still has not produced a completely satisfactory explanation or means of predicting effective leadership behavior.

Although leadership can be divided into several categories, it is important to distinguish between two areas of leadership—formal (appointive) and informal (which arises or develops in an initially leaderless group). There is a larger body of knowledge and research pertaining to formal or appointive leadership than there is directed toward the informal or emergent leadership. The reason for this imbalance in research is that it is easier to find appointed leaders because there are so many of them in organizations. The groups that are leaderless at the start are not so prevalent as groups with appointed leaders; yet the study of these groups may be more important as a means of distinguishing differences between
leaders and non-leaders. There is reason to believe that leaderless and appointive leadership behaviors have something in common when the mutual task of influencing a group toward goal accomplishment is considered.

Review of Research on Leadership Traits

Behavioral scientists have looked at the nature of leadership in several broad perspectives. From 1900 through the 1940's, the primary investigations of understanding leadership were through personality traits.

Stogdill (1948) summarized the literature on personality traits characterizing leadership. In this comprehensive study, the "leadership traits" most commonly identified were: (1) physical and constitutional factors—i.e., height, weight, physique, and appearance; (2) intelligence; (3) self-confidence; (4) sociability; (5) will—i.e., initiative, persistence, and ambition; (6) dominance; and (7) surgency—i.e., talkativeness, enthusiasm, alertness, and originality. As Geier (1967) summarized Stogdill's results:

Among all these studies, the only common conclusion that receives even fair support is that leaders excel non-leaders in intelligence, scholarship, responsibility, activity and social participation.

From his research, Stogdill did not find the results surprising. He believed that leadership status came from the leader taking an active part in group activities and
showing his ability to move the work forward. This meant moving about, getting things done, and being active. Stogdill said the leader was a central point for responsibility; he coordinated group members' activities and moved them toward goal accomplishment. Stogdill believed that the evidence suggested not a trait approach to leadership, but a variety of personality variables which interacted with various situations in relation to the personality factors of the followers, and to the requirements of the situation itself. This, then, could be labeled the beginning of the situational variables recognition.

Looking at leadership from the situationist's point of view, Gouldner (1949) logically reasoned that a two-fold subdivision could be made; i.e., one group believed that leadership traits were universal to all leadership conditions, and the other believed that leadership traits varied from situation to situation and group to group. If the first group were right, that leadership is attributable to traits, then it would be so in each group. Gouldner pointed out that it could not not be so, because:

No matter how spontaneous and informal the group, the members never engage in random, continually unpatterned activities. There is a certain degree of persistence or patterning of activities which a group undertakes, be it bowling, playing bridge, engaging in warfare or shoplifting.

These persisting or habitual group activities, among other things, set limitations on the kind of individuals who
become group members and, no less so, upon the kind of individuals who come to lead the group. Gouldner cites other peers who agree with his approach. Gibb (1947) said:

There is no one leadership type of personality. One man might achieve leadership status because he has superior intellectual endowments which force him consistently upon the notice of others and make them dependent upon him. A second achieves leadership because he has a quiet, helpful interest in fellow group members and because what British psychiatrists call his 'contact' is good. Leadership resides not exclusively in the individual but in his functional relationship with other members of his group.

Jenkins (1947) concludes in his summary of leadership studies that leadership was specific to the particular situation being investigated.

Jennings (1943), a sociometrist, emphasized that leadership is the product of interaction among members of a group, not of their personality characteristics. However, she found certain constant characteristics of leaders in her studies. Even though Gibb (1947) recognized the relationship of the "situation" to leadership, he added that it did seem there were some broad personality attributes which, just because they had them, did not cause a person to have placed upon him a higher amount of leadership status. However, if the person did have these personality attributes, he might be placed higher on some scale of choice by the group members.
The de-emphasis in universal personality traits characterizing leadership did not deter all experimentation in the area. Lancaster (1956) made an analytical study of research from 1904 to 1954 on leadership displayed by American children and youth. Of the 64 studies, most were in line with the findings of Stogdill (1948). Lancaster also cited the trend away from personality traits to interaction. One of her primary findings stated:

Research findings indicated that the ability to initiate an activity and help a group move toward its goals is necessary for leadership behavior on any age level. Leadership is not acquired by the mere possession of traits but is given by the group to the individual who is respected and is perceived as having those qualities necessary to help achieve goals.

Mann (1959) did a complete review of the literature on the relationship between personality and performance in small groups, which covered the years 1900 to 1957. This review considered all aspects of group behavior as well as leadership. Even with the monumental task of economically clustering some 500 variables, Mann made the following observations on leadership relationships:

1. Positively related to leadership was intelligence, adjustment, extroversion, dominance, and measures of interpersonal sensitivity.

2. Conservatism was negatively related.

Bass (1960) also reviewed all leadership and small-group literature through 1958 in developing a theory of leadership. After reviewing evidence from past studies,
he considered personality traits as a constant variable over all groups and, if active at all, would be situational. He therefore developed a host of hypotheses that did not specifically include personality traits.

In another extensive review of all kinds of small-group variables, researcher Hare (1962) noted that:

While correlations between good personality traits and leadership are generally positive, they are rarely large. There are indications that certain traits such as intelligence, enthusiasm, dominance, self-confidence, social participation and equalitarianism are frequently found to characterize leaders... Usually, however, the relation of the traits to the leadership role is more meaningful if consideration is given to the detailed nature of the role and the characteristics of the followers.

McGrath and Altman (1966), in their review of small-group research, point out that individual group members' abilities were not necessarily useful for predicting task performance of the group, even though these measures will quite often show positive and consistent relationships with the performance of group members. They do not consider it profitable to pursue research from the point of view of individual personality characteristics unless such factors could be studied in respect to group composition. Discussing the information from research about leadership performance, they summarized that effective leadership behavior seemed to be a function of several characteristics and conditions:
1. Individual personality characteristics such as extroversion, assertiveness and social maturity, but not a host of other, seemingly similar characteristics

2. Education

3. Intelligence

4. High group status

5. Training in leader technique

As leadership studies continued to be published, the direction from "universal traits" to the "situational approach" had many benefactors. However, even with this continuous emphasis, researchers were finding significant relationships of personality variables with leadership. Another position, advanced by Hollander and Julian (1968), states that leader personality can account for some part of the variance and situational variables for another portion, but that we will make larger strides in research by examining the interrelationship of the two. This view has been the direction of research by Fiedler (1967), Hunt (1967), and others. In following what they believed to be the dyadic nature of the leadership process, Hollander and Julian (1968) attended to the interactive relationships of dominance, assertiveness, authoritarianism, activity level, social perceptiveness, with properties of the situation in which the leader functions.

Gibb wrote the "Leadership" section for the first edition of the Handbook of Social Psychology (Lindsey and
Aronson, 1954) and, subsequently, updated the review of the literature in the second edition (1969). Gibb (1969), agreeing with Hollander and Julian that leadership is a function of personality variables and the situation in interaction, points out the antitheses found consistently throughout the research:

... emergence as leaders cannot yet be fully explained by personality attributes, or by abilities, or by ratios of these to the needs of the group, though all of these are significant. The final determiners of the rise to leadership remain somewhat of a mystery.

He does, however, make statements that appear to be currently accepted. For example:

... leadership is a function of personality, and the social situation, and of these two in interaction.

And, as a concluding observation:

... there is abundant evidence that member personalities do make a difference to group performance, and there is every reason to believe that they affect that aspect of the group's behavior to which the leadership concept applies. But other aspects of group behavior, namely, structure, syntality, and task, must also be taken into consideration in attempting a complete description of leader behavior.

Fiedler (1971), in the latest major review of his research on his "Contingency" model of leadership, examined the preceding literature on leadership. He pointed out that previous studies showed the leadership-trait approach demonstrating weak, but stable, relationships.
He does admit that they will show most of the measurable variance in leadership success when other relevant situational factors are held constant. He does not believe this to be particularly important, however. Fiedler points out the more valuable contributions of the situational studies and recognizes the existence of human relations and interactional theories of leadership. Fiedler explains a "contingency" theory, in which the effectiveness of a leader in a situation depends on the combination of leader-member relations, group structure, position power, and the "leader motivational pattern" of the leader. The leader motivational pattern is the sum of item scales made up of a bipolar scale of personality characteristics of the person with whom the leader least preferred to work (LPC).

Hollander (1971), in an introduction to the March 1971 issue of Administrative Science Quarterly devoted to organizational leadership, states:

Today there is a resurgence of interest in the characteristics of people who fill organizational roles, especially in the case of those occupying leader roles, considerations of style are significant even though the situational approach has been dominant for the past two decades or more. Fiedler is among those researchers concerned with leader style. His contingency model (Fiedler, 1965, 1967) is probably the best example of an attempt to integrate individual characteristics with structural and task properties of the situation.

Hollander concluded his introduction by saying:
The situational view was never aimed at throwing away concern with the individual or his attributes, including perceptions and behavioral propensities, but rather at seeing them as differentially appropriate to varying circumstances and the kind of decisions and outcomes affected. Individual differences ought still to be a matter of considerable concern in such matters of personal style or entrepreneurial zeal, vision and ability to inspire trust.

The preceding review of research on leadership characteristics from 1900 to date appears to rule out the prediction of leadership based on personality or leadership traits alone. Also, it appears to recognize an important impact of situational variables on all leadership situations. It recognizes an interacting of personality, situation, and environmental variables and calls for research toward examining various relationships of leadership.

It does not, however, say that there should not be continued research regarding the relationship of personality characteristics to emergent leadership. Research is needed to discover what characteristics may relate significantly to emergent leadership in particular situations. Examining the relationships of various individual variables to leadership emergence in small, initially leaderless groups—such as the experiential program under study—adds information to this body of knowledge. The following section reviews research on some variables that have often shown significant relationships in previous studies.
Review of Research on Potential Predictor Variables

A review of research shows a variety of personality variables having a small, positive, but stable relationship to leadership. With the small amount of research on the relationship of personality variables to emergent leadership (no research identical to the present study), a review must necessarily look at available relevant research to identify possible significant relationships.

Previous discussion of reviews of research on personality variables points out the consistent positive relationships of intelligence and dominance (Gibb, 1947; Stogdill, 1948; Gouldner, 1949; Gibb, 1954, Mann, 1959; Bass, 1960; Hare, 1962; McGrath and Altman, 1966; Geier, 1967; and Gibb, 1969). In addition, several other studies show relationships of these variables to leader behavior.

Ghiselli (1963) and his associates note several traits which are significantly correlated with management performance ratings at different organizational levels in several different organizations. These traits were: (1) intelligence, (2) supervisory ability, (3) initiative, (4) self-assurance, and (5) individuality.

VanderLind (1970) investigated personality and biographical characteristics of certain campus leaders and non-leaders. He found a significant difference between leaders and non-leaders on the dominance scale of the
California Psychological Inventory (CPI), as well as on several others. Miles (1968) made an investigation into the relationship between certain personality traits and management success with managers at all levels in seven different companies. He used the Wonderlic Personnel Test, Edwards Personal Preference Schedule, and the Minnesota Multiphasic Personality Inventory (MMPI). Traits found significantly related to success in one or more companies were: mental ability, originality, dominance, autonomy, and change. Williams (1969), in a study of group geography and the assumption of leadership, found that leadership emergence was not influenced by geographical position, but was highly related to dominance.

Campbell et al. (1970) relate aspects of a large-scale study by the Industrial Relations Center, University of Minnesota, during the early 1960's. The study of 452 managers in 13 firms operating in Minnesota found significant relationships with rankings of effectiveness (top company officials ranked them on the basis of overall management competence) from the Wonderlic Personnel Test, and dominance as measured by CPI. Selover (1962), in a study of 118 college men hired in 1956-57, showed substantial differences in the rate of advancement and showed significant relationships with intelligence and college grade point average. Other reviews of organizational research in large and small organizations, made by Campbell et al.
(1970), lend support to a positive relationship between intelligence (or scholastic success) and managerial success.

Kopff (1966), however, failed to find significant relationships between intelligence and manager performance as measured by the Wonderlic Personnel Test and the California Short-Form Test of Mental Maturity. This was a study of 270 administrators, technicians, and management personnel in an industrial chemical corporation.

Christie and Geis (1970) report studies on a construct called Machiavellianism. They use the short term "Mach" when referring to the Machiavellian. A Machiavellian traditionally is one who "views and manipulates others for his own purpose." The Machiavellian scale scores one on whether he perceives himself as a high Mach or a low Mach. A high score results from one's choosing statements so that "it [the score] represents the degree to which a respondent believes that people in general are manipulatable; that interpersonal manipulation is possible." They found in studies that high Machs do better than low Machs when three crucial conditions are met that are typical of the emergent leadership situation:

1. Interaction is face-to-face.

2. Subjects have a chance to improvise and respond freely.

3. The situation permits the arousal of emotion where the experiment has serious consequences.
All of these conditions were typical of the program under investigation.

In some 20 to 30 experiments over the last ten years on various phases of Machiavellian behavior, no direct experiment concerning the relationship of Machiavellianism and informal leadership was performed. This was probably due to the fact that most experiments were concerned with the success of an individual high Mach in a situation where two persons interact, or with the result of a coalition in a large-group situation. Christie and Geis, from their research of leaderless group discussions and factors from other studies, postulate that:

High Machs take over the leadership in informal face-to-face groups. They initiate and control the structure of the group and thereby control the process and outcome.

Christie and Geis (1970) propose a model of hypothesized interaction between the Mach and situations with predicted tactics. If this model is relevant, Machiavellianism should be significant. This model says that high Machs in a loosely-structured situation will limit testing, initiate and control the structure, and instrumentally exploit the resources. In a highly-structured situation, they will work within the system and exhibit perfunctory performance with occasional apathy. The hypothesis is based on the premise that the groups are operating as loosely structured (exact role behavior of par-
ticipants not predefined, exact means to achieve goals
not predefined, and improvisation required).

Geis (1968) assigned 298 students to four-person
groups matched by all high Machs, all low Machs, and two
of each. The study was designed to find out if high Machs
took control of groups when members had a "real" stake in
group outcome. She also wished to determine whether high
Machs' ability to organize resources, exploit and focus
them on winning—which has appeared in studies of individ­
ual competition—would also appear in the cooperative sit­
uation within the groups (as measured by competition
between groups).

Geis stated:

At the first meeting of the group members,
they found out they would work together all
semester on a laboratory project which would
count one-fourth of their final course grade.
They were given 20 minutes to get acquainted
and begin discussing project ideas and then
asked to choose a leader. In 19 of the 44
groups (43 percent) with a high Mach avail­
able, the highest scorer in the group became
leader more frequently than any of the three
lower scoring members.

Review of Research on Peer Ratings
or Emergent Leadership

The use of peer ratings as an estimator or predictor
of eventual leadership success or managerial effectiveness
has been substantiated in a number of representative stud­
ies over the last 25 years.

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The classic study was by Wherry and Fryer (1949). In an attempt to distinguish between a popularity contest and a valid prediction in peer ratings, they studied two Officer Candidate classes and compared peer ratings and superior ratings over sequential time periods. Their results set a precedent followed by later investigations.

1. Buddy ratings appear to be the 'purest' measure of leadership.

2. Co-workers are able, at the end of the month, to evaluate leadership to a degree equaled by instructors only after four months of observation.

3. Nominations, which are more reliable than graphic ratings, are equally good measures of leadership.

4. While both nominations and graphic ratings by co-workers show quite satisfactory reliability after one month, the reliability of nominations after four months is outstandingly higher than that of any other variable upon which the test was made.

Hollander and Webb (1955), looking at previous sociometric research as well as the Wherry and Fryer research, investigated the relationship between leadership, followership, and friendship peer nominations within eight groups of Naval Aviation Cadets (N=187). The cadets were asked to nominate the top three to lead a special unit and then list three that were least qualified. On a followership form, they were asked to assume they had been chosen leader and pick three they would most want as part of the unit and three they would least want. The third form asked them...
to list three cadets whom they considered their best friends in the section.

Results showed the leadership and followership nominations intimately related in a positive direction and, secondly, leadership and followership nominations, to a considerable extent, were independent of friendship choices.

Gordon and Medland (1965) indicated, in a study of military groups, that:

From the result of the present study, it may be concluded that peer ratings of leadership potential, even when obtained on the basis of relatively short acquaintance, are primarily related to observed or inferable attributes of the individual being rated, rather than to fortuitous factors associated with the particular composition of the group that he happens to be in. Present findings provide additional support to the use of peer ratings of leadership potential obtained in one group for selecting individuals to serve in a leadership capacity in some other group, where both groups have the same task orientation and are drawn from the same population.

In the Gordon and Medland study, the groups and the tasks they were required to do were similar to the groups and tasks required in the present study.

The efficacy of peer ratings for effective leadership selection has been demonstrated by several other investigators, also. Gleason (1957) analyzed the association between peer rankings of leadership and intelligence, as well as faculty ratings of leadership, in a military
training school. These rankings were made on seven- to nine-man leaderless group discussions. The results were:

Group member rankings of leadership displayed during a leaderless group session were predictive of leadership scores received in training. Peer rankings were also correlated with faculty ratings of personality traits and overall leadership abilities and observer ratings of traits and leadership during training and on an OCS-type situational test.

In a follow-up phase of the study, Hollander (1965) utilized the peer nominations he began in 1955. He had over 700 trainees complete several peer nomination forms at various stages of training. Using average grades—secured from fitness-report ratings assigned by their direct superordinates—as a performance criterion, his findings supported the use of yearly peer nominations as a valid supplemental measure in predicting performance after training.

In still another study, Reynolds (1966) assigned 33 senior Air Force ROTC college students to positions of responsibility by combined staff and peer sociometric ratings to determine the efficacy of peer ratings in predicting leadership success. Significance at the .01 level was found with the success criterion.

Booker and Miller (1966) asked ROTC students to nominate peers for five important Brigade positions, and the "Cadre" was asked to do the same. Repeat peer nominations with other ROTC cadets at summer camp showed high corre-
lution with previous peer nominations. The conclusions drawn were:

1. If a peer group has sufficient interaction and is reasonably stable over time, the consistency of its nominations is relatively high. Moreover, the peer-nomination technique has added advantage of being able to identify the members of the group who rank high in informal leadership status.

2. The reliability of peer nominations appears to be a function of the relative importance of the position within the organization.

3. The high correlation between peer and superordinate nominations indicates that peers are just as objective as their superordinates in selecting an individual for promotion. This, in turn, implies that in making their selection peers are not swayed by their personal liking for the candidates, but consider pretty much the same factors as do their superiors.

The literature on the efficacy of peer ratings provides substantial reasoning for designating emergent leadership as the mean of the six peer ratings over two six-week projects. Emergent leadership (peer ratings) is the dependent variable.

Need for the Study

One of the important reasons for conducting any study to identify potential leaders is the high cost of management development. Serbein (1961) found, in a survey of 35 companies employing 10,000 or more persons, that eight of them spent more than one million dollars per year on
in-company training. One organization spent over fifteen million dollars on in-company training programs. A small-percent improvement in leadership selection could save these companies, as well as large bureaucratic agencies, considerable money and time.

Selection, however, is not necessarily the most important aspect to be considered. The effective training of managers at any stage of this development should be considered. This is the important aspect in the experiential program under study. Knowing the characteristics of the leaders would help in the development of the remaining group members. An alternative would be to divide the group into leaders and non-leaders. In this way, leaders in one group would be able to compete with each other for leadership and learn to share in their leadership behavior and skills. The non-leaders in a group would have the opportunity to emerge and experience the reinforcement of successful leadership. These are worthwhile objectives for this type of an academic program.

The current trend in education toward working in small groups for goal accomplishment could benefit in understanding group-leader effectiveness.

In addition to helping teachers to appoint effective leaders to certain groups, such knowledge would give teachers some ideas as to which persons may arise as emergent leaders in possible conflict with appointed leaders.
This would be especially important in committee assignments of interdepartmental members.

The continually-increasing employment in government service, and additional costs to taxpayers, are excellent reasons for developing effective leaders to coordinate people and material resources.

Emergent Leadership--Research Differences

Bass and a number of associates (Bass, 1951; Bass and Coates, 1952; Bass and Klubeck, 1952; Bass and Wurster, 1953; and Bass et al., 1953) made a series of studies on leaderless discussion groups for a variety of small-group study variables. Leadership results were:

1. Leaderless group discussion, resolving a problem, appeared to have limited use for predicting office potential.

2. Different seating arrangements did not differentiate leader behavior.

3. No significant difference between rank of supervision, intelligence, and biographical data appeared in leaderless discussions.

4. Second study showed opposite relation when nature of the problem was changed.

5. In a study of the association of leaderless group discussion behavior with various personality characteristics of groups of college girls, a negative relationship to authoritarianism was found.

Borg (1957) compared the behavior of group members

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and leaders in problem-solving six-man groups with and without appointed and emergent leaders. Emergent leaders were found to behave no differently when they were appointed leaders; emergent leaders still exhibited more leadership than others, even when someone else was appointed.

Borg and Tupes (1958) investigated the relationship between personality characteristics and leadership performance in different task situations among OCS candidates who were assigned two different tasks. One was a military problem, the other a leaderless group discussion. Combined leadership scores on both tasks were highly and positively related to ratings of extroversion, intelligence, assertiveness, social maturity, and energy.

Crockett (1955), in a study of 72 business, industrial, and government groups, compared the behavior and characteristics of group members who exhibited different degrees of leadership in group discussions. Emergent leaders were differentiated from other group members by proposing more problems, seeking more information, and becoming more ego-involved in discussions. Also, designated leaders rated emergent leaders as having more experience with group problems, being more important to the group, and having higher status than other group members.

Kopff (1966) studied 270 administrative, technical, and management personnel in an industrial chemical corporation to explore the relationships among intelligence,
selected personality traits, goal-setting ability, and a manager's performance. Coefficients of correlations were not significant for any of the three managerial levels. He concluded that "in a rapidly growing and dynamic corporation, intelligence and personality traits, beyond an undetermined minimum level, are not related to success on the job." These again were appointed leaders.

Wilson (1954) made a study of emergent leadership among 135 undergraduate subjects in eight sections of public speaking, divided into 32 chairmanless groups of four or five for discussions. Peer rating determined leaders. He found eight variables significantly associated with autocratic leadership: (1) participation; (2) assumption of chairmanship function; (3) estimated exerted influence; (4) sociotelic acceptance after discussion; (5) appropriateness of speech habits; (6) stating the goal; (7) stating approved solutions; and (8) consideration of worthwhile ideas. His overall summary of the study was that students who participated the most, students with worthwhile ideas, and students who assumed chairmanship function were the measured leaders. Also, they were rated as being significantly more influential and most often were chosen as future discussion companions.

Dubno (1968) stated the need to reexamine personality variables in light of recent research. He experimented
with initially leaderless problem-solving groups, looking at the relationship of emergent leaders to scales on the MMPI (Minnesota Multiphasic Personality Inventory). He noted that the Pt scale "presumed to measure such personality or behavioral characteristics as cautiousness, hesitation in making up one's mind and procrastination."

The groups in this experiment were put under pressure for quality performance.

Dubno indicated that "results showed the most effective leaders to be those with fast decision-time characteristics, urging their groups to arrive at high quality solutions," and "it was further suggested that predictions of group effectiveness depend on interaction among personality, task and situational variables."

These studies have characteristics which are somewhat similar to the design of the present study. None, however, are exactly the same as the present study. The investigators examined leaderless group discussions, small problem-solving groups, and they examined relationships between personality variables and leadership. They found few differences between appointed and emergent leadership and scattered results on personality characteristics or predictors.

Purpose of the Study

The purpose of the study was to examine the relation-
ship between several potential predictor variables and emergent leadership for prediction of future leadership potential in an experiential management program.

The study used data from the Fall 1971 term of a Management Department class of 70 male students in a mid-western university Business College. They were divided into small, initially leaderless, task-oriented groups.

Knowledge about potential predictor variables was needed for information regarding program design, descriptions of students who were successful in the program, and possible linkage with program goals as they are represented by the parameters of role behavior, problem solving, decision making, and presentations. In addition, such knowledge could help determine the amount of student counseling and coaching needed, as well as the need to enrich program content or possible need for change of faculty positions or roles.

Hypotheses

Previous investigations cited have found several predictor variables to have positive effects on criterion variables. Therefore, for the purpose of this study, the following hypotheses will be investigated, and other possible predictor variables from the research battery will be examined for potential relationship to emergent leader-
There is a significant relationship between the dependent variable of emergent leadership as determined by peer ratings and the following independent variables: (1) intelligence, (2) dominance, (3) grade point average, (4) Machiavellianism.

The results of the investigation should be looked upon as the relationship between the independent variables and the dependent variable of emergent leadership, but not showing causal relationships as such.
CHAPTER II

DESIGN METHODOLOGY

Introduction

The purpose of this investigation was to examine the relationship of potential predictor variables for future leadership potential. This criterion was called emergent leadership and was defined as the mean of six peer ratings of leadership rank taken over the course of two six-week projects. The strength and direction of the predictions were determined by the examination of the intercorrelations of potential predictor variables (scale scores from a performance and research battery) with the peer rankings. An intercorrelation matrix was generated by computer, and a stepwise regression analysis was performed to determine the entrance sequence of variables and the strength of the variance relationship.

The variables systematically included in the stepwise regression were those variables found to contribute the most to the increase in the coefficient of determination (multiple $R^2$), which is the proportion of variance of the dependent variable accounted for by the independent variables included in the regression equation.
Sample

The sample consisted of 70 male students from the corequisite advanced management classes in the Management Department of a Midwestern university during the fall 1971 term.

Ten student project teams varying from six to eight members were required to develop two assigned projects. Six weeks were allowed on each project and the students were required to make presentations to faculty evaluation teams during the course of the project. The two faculty teams, each consisting of three persons, observed and evaluated five project groups for the first project as well as the other five groups for the second project.

Instruments

The dependent variable emergent leadership was determined by averaging the six peer rankings over the two projects. The students were given the results of these evaluations on computer print-out sheets after each evaluation.

The potential predictor variable scores came from a performance research battery given to all students in the first management-training course. These scales were from the Need Achievement, Mach V, Ship Destination, Wonderlic Personnel Test, Rokeach Dogmatism Scale, Survey of

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Interest surveys. In addition, self-reported demographic variables of age and grade point average were used.

These standard scales were chosen by a faculty team to acquire the broadest range of results to be gained in a feasible testing time for large groups of students. They were chosen because the factors they measured appeared, on the basis of empirical evidence and rational grounds, to be related to managerial success in academic programs. These factors appeared to be independent with little, if any, overlap among the batteries. The factors also "cut across" a variety of psychological dimensions, such as attitudes, interest, personality, and ability.

The scales taken from the various batteries are as follows:

(1) Need Achievement (n ach) was measured by a need achievement questionnaire developed by Hermans (1970). The items in the questionnaire were written so as to cover the following aspects:

The achievement motivated individual (a) has a high aspiration level in so far that it does not reach beyond his capacities; (b) He prefers high probabilities when the outcome of an action is highly determined by external factors such as chance; (c) He has a strong striving for upward mobility; (d) He persists for a long time when confronted with a task of intermediate difficulty; (e) When interrupted while working at a task he wants to accomplish, he has a strong tendency to
resume the task; (f) He has a dynamic time perception and feels things are happening quickly; (g) His time perspective is very much future oriented; (h) His choice of a task partner is primarily directed by the competence of the other; (i) He seeks recognition by performing well in his work; and (j) He likes to perform work well.

(2) Machiavellianism (Mach) was measured by the Mach V developed by Christie, Geis, and others (1970). As reported by Robinson and Shaver (1969), this 20-item questionnaire was designed to measure:

... a respondent's feelings about whether other people can be manipulated so as to achieve (usually the respondent's) desired ends.

(3) A factor known as "general reasoning" came from the Ship Destination Test by Christensen and Guilford (1956). General reasoning is best interpreted as:

... the ability to define, comprehend, or structure a problem in preparation for solving it.

(4) Intelligence is measured by a paper and pencil group test called the Wonderlic Personnel Test. Intelligence, according to Weschler (1938), is:

... the global or aggregate capacity to think rationally, act purposefully, and to deal effectively with one's environment. This accepted definition is inherent in Wonderlic's (1970) "ability to learn."

(5) Dogmatism was measured by the Rokeach Dogmatism Scale developed by Rokeach (1960). The scale is designed
to measure individual differences in openness or closedness of belief systems. According to Rokeach, it reveals the extent to which the person can receive, evaluate, and act on relevant information received from the outside on its own intrinsic merits, unencumbered by irrelevant factors in the situation arising from within the person or from the outside.

(6) Measures of the basic motivational pattern or values that a person holds are measured by Gordon's (1960) Survey of Interpersonal Values. Scales of six critical values involving an individual's relationship to other people—or their relationship to him—are:

Support (S).—Being treated with understanding, receiving encouragement from other people, being treated with kindness and consideration.

Conformity (C).—Doing what is socially correct, following regulations closely, doing what is accepted and proper, being a conformist.

Recognition (R).—Being looked up to and admired, being considered important, attracting favorable notice, achieving recognition.

Independence (I).—Having the right to do whatever one wants to do, being free to make one's own decisions, being able to do things in one's own way.

Benevolence (B).—Doing things for other people, sharing with others, helping the unfortunate, being generous.

Leadership (L).—Being in charge of other people, being in a position of leadership or power.

(7) Those stable traits describing how normal, well-adjusted people differ from each other are measured by
the Thurstone Temperament Schedule. Thurstone's (1953) scales are a practical description of important aspects of temperament and assess those traits that are relatively permanent for each individual. The seven scales are:

**Active (A).**—A person scoring high in this area usually works and moves rapidly. He is restless whenever he has to be quiet. He likes to be 'on the go' and tends to hurry. He usually speaks, walks, writes, drives and works rapidly, even when these activities do not demand speed.

**Vigorous (V).**—A person with a high score in this area participates in physical sports, work requiring the use of his hands and the use of tools, and outdoor occupations. The area emphasizes physical activity using large muscle groups and great expenditures of energy. This trait is often described as 'masculine,' but many women and girls will score high in this area.

**Impulsive (I).**—High scores in this area indicate a happy-go-lucky, daredevil, carefree, acting-on-the-spur-of-the-moment disposition. The person makes decisions quickly, enjoys competition, and changes easily from one task to another. The decision to act or change is quick regardless of whether the person moves slowly or rapidly (active), or enjoys or dislikes strenuous projects (vigorous). A person who doggedly 'hangs on' when acting or thinking is typically low in this area.

**Dominant (D).**—People scoring high on this factor think of themselves as leaders, capable of taking initiative and responsibility. They are not domineering, even though they have leadership ability. They enjoy public speaking, organizing social activities, promoting new projects and persuading others. They are the ones who would probably take charge of the situation in case of an accident.

**Stable (E for emotionally stable).**—People who have high stable scores usually are
cheerful and have an even disposition. They can relax in a noisy room, and they remain calm in a crisis. They claim that they can disregard distractions while studying. They are not irritated if interrupted when concentrating, and they do not fret about daily chores. They are not annoyed by leaving a task unfinished or by having to finish it by a deadline.

Sociable (S).—Persons with high scores in this area enjoy the company of others, make friends easily, and are sympathetic, cooperative, and agreeable in their relations with people. Strangers readily tell them about personal trouble.

Reflective (R).—High scores in this area indicate that a person likes meditative and reflective thinking and enjoys dealing with theoretical rather than practical problems. Self-examination is characteristic of reflective persons. These people are usually quiet, work alone, and enjoy work that requires accuracy and fine detail. They often take on more than they can finish, and they would rather plan a job than carry it out.

(8) The Thurstone Interest Schedule is a check list by which a person can systematically clarify his understanding of his vocational interests. The ten scores on the profile represent relative interest in ten vocational fields. These are:

- PS = Physical Science
- BS = Biological Science
- C = Computational
- B = Business
- E = Executive
- P = Persuasive
- L = Linguistic
- H = Humanitarian
- A = Artistic
- M = Musical

The demographic variables of age and college grade point average were self-reported scores on a Personal Data Sheet completed at the beginning of the term.
Procedure

The students were randomly assigned to ten project groups that varied from six to eight members and were assigned a number from 1 to 10. Groups 1-5 would be observed and evaluated by a three-person faculty team (A). Groups 6-10 would be observed and evaluated by a second faculty team of three persons (B). All the students, however, would be together to receive general instructions and course content (which covered problem solving, decision making, role behavior, and presentations). All six faculty members alternated in providing classroom course content. Faculty members worked independently with groups requesting assistance in individual group planning and analysis sessions.

Faculty comments during these sessions were one of three sources of evaluation during the course of the project. Faculty comments also provided the second source of evaluation when, as a team (A or B), they heard the formal progress reports. Periodically, the students were required to make a formal presentation of their project progress to the faculty team. If the progress was satisfactory, the project group was allowed to move to the next phase. If the progress was not satisfactory, they were required to restudy and rework their project plan and return to the faculty evaluation team for another
formal presentation. Their presentation skills and use of communication devices were critiqued, as well as their project progress.

The third source of feedback was from the individual peer ratings conducted after each one-third of the project period. Students were asked to rate their co-workers, excluding themselves, on the basis of rank of leadership.

Students were given computer cards for each person in their group, excluding themselves. They were asked to look over the cards and, assuming they were going to work with this group again and were interested in a first-class product, pick the card of the person they would want to lead the group toward successful task accomplishment, placing this name first. They then should pick the card for the person they felt might jeopardize the group's chance of achieving the objective and place it last. They should then so order the rest of the cards from second to next to last, using the same criterion.

After the cards were computer-processed, the individual received a print-out showing all of the average ranks without identification and his mean rank identified. The mean ranks were also reported in \( z \) scores.

The course manager and the faculty members received a master print-out of all student names and ranks.

The students were told that peer rating results could affect their final project grade. After all peer evalua-
tions for both projects were completed, a weighted formula determined the raising or lowering of the student's individual grade.

At the beginning of the term, the students were told that three high positive peer ratings would help their grade, three low negative peer ratings would hurt their grade, and a middle range group of peer ratings would have no effect on grade. The students did not know exactly when a peer rating score rated a "plus" or when it rated a "minus."

After a formal final presentation and submission of a written report, the faculty board issued each project group a grade. Each member of the group received that grade, regardless of his contribution.

After completion of Project #1, Groups 1-5 were reassigned so that no more than two members of a group would be in a project team again, and the other faculty team (B) was assigned to observe and evaluate them. The same procedure was carried out for Groups 6-10, and they were assigned Faculty Team A.

The process for Project #2 was the same as for Project #1.

For the students' course grade, the first and second project grades, as well as the peer results, were placed in a weighted formula to determine the individual course grade.
CHAPTER III

FINDINGS

The purpose of the study was to measure the relationship between potential predictor variables and emergent leadership in an experiential program. The results showed a significant relationship for one portion of the hypotheses—grade point average; no significant relationship for three other portions—intelligence, dominance, and Machiavellianism; and significant relationships for two other variables—Biological science and conformity.

An intercorrelation matrix of all the variables is shown in Appendix B, and the results of a multiple regression analysis are reported in Appendix C; the summary of the data is given in Table I. The highest valued predictor was the students' reported college grade point average. This variable showed the strongest relationship to the criterion variable, emergent leadership. It showed an F level of 11.65, which surpassed the .00 needed for significance at the .05 level. This means that, of all the potential predictor variables measured, reported college grade point average accounted for the largest share of variance. The multiple $R$ of .38 accounts for 15 percent of the total variance.

This indicates that the higher the GPA reported by
<table>
<thead>
<tr>
<th>Variables</th>
<th>Simple r</th>
<th>Cumulative Multiple R</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reported GPA</td>
<td>.38*</td>
<td>.38243</td>
</tr>
<tr>
<td>2. Dogmatism</td>
<td>-.16</td>
<td>.46823</td>
</tr>
<tr>
<td>3. Activity</td>
<td>.25*</td>
<td>.52332</td>
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<td>4. Business scale</td>
<td>-.16</td>
<td>.55706</td>
</tr>
<tr>
<td>5. Support</td>
<td>.18</td>
<td>.58910</td>
</tr>
<tr>
<td>6. Biological science</td>
<td>.26*</td>
<td>.61521</td>
</tr>
<tr>
<td>7. Impulsive</td>
<td>-.01</td>
<td>.64155</td>
</tr>
<tr>
<td>8. Age</td>
<td>.10</td>
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</tr>
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<td>9. Machiavellianism</td>
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<td>10. Independence</td>
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<td>11. Reflective</td>
<td>.10</td>
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</tr>
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<td>12. Intelligence</td>
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<td>13. Physical science</td>
<td>.10</td>
<td>.70009</td>
</tr>
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<td>14. Linguistic</td>
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<td>15. Humanitarian</td>
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<td>16. Persuasive</td>
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<td>17. Artistic</td>
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<td>18. Musical</td>
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<td>19. Stability</td>
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<td>20. Sociable</td>
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<td>21. Benevolence</td>
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<td>22. Executive</td>
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<tr>
<td>23. Dominance</td>
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<td>24. Leadership</td>
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<tr>
<td>25. Recognition</td>
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<td>26. Conformity</td>
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<td>27. Vigorous</td>
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<td>28. Need achievement</td>
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<td>29. Computational science</td>
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<tr>
<td>30. Logical reasoning</td>
<td>.08</td>
<td>.75009</td>
</tr>
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</table>

*Significant at .05 level.

the student, the more likely the student was to be designated as leader in the peer rankings.
The second predictor variable selected for inclusion in the multiple correlation was dogmatism, measured by the Rokeach Dogmatism Scale. This variable, however, showed a negative relationship to emergent leadership. This indicates that the more answers a person marked negatively on the scale, the more: (1) he believed he was more tolerant of others; (2) he was more open in his belief system; (3) he had little difficulty discriminating between the information received and its source (authority); and (4) the more likely he would be designated as leader in the rankings. The addition of this variable of 6.26 raised the multiple $R$ to .47.

The third predictor variable selected in the multiple regression analysis was the activity scale from the Thurstone Temperament Survey. The $F$ of 4.96 was significant at the .05 level. This indicates that the students who chose statements on the scale that said they (1) liked to move around, (2) were usually restless and in a hurry, (3) did not like to dawdle with tasks, (4) liked to drive fast, and (5) talked louder than others had a tendency to be ranked highest by their peers. The addition of this variable resulted in a multiple $R$ of .52.

The next four variables in the regression analyses were less effective predictors. These four variables might have increased the multiple $R$ to .64. However,
this increase does not add significantly to the predictive efficiency of the first three variables.

The total multiple $R$ of all 30 predictor variables (Table I) was .75. The first three significant potential predictor variables—grade point average, dogmatism, and activity—accounted for 50 percent of the total variance.

The examination of the correlation coefficients in Table I shows the correlation of grade point average with the criterion variable to be .382; dogmatism, a negative correlation of -.184; activity level, with the criterion of .249. Several of the variables correlated with the criterion as high or higher than the most significant variable. However, they were not selected as significant, because the stepwise regression computer program is designed to select the next most significant contributor variable to the total multiple $R$. That is, the program looks for that variable that contributes the most to the increase in the coefficient of determination, or which increases the proportion of variance of the dependent variable accounted for by the independent variables included in the regression equation.

A summary, discussion of the findings, and recommendations are given in Chapter IV, and in Chapter V.
CHAPTER IV

DISCUSSION OF FINDINGS

The purpose of the study was to determine the relationship between emergent leadership and several potential predictor variables. The results of the investigation confirmed the hypothesis that there is a significant relationship between emergent leadership and reported grade point average, but it failed to confirm the relationship with intelligence, dominance, and Machiavellianism. Two other variables from the remaining 26 investigated were found to add significantly (at the .05 level) to the prediction of emergent leadership. They were the variables of dogmatism and activity.

From this study grade point average is the most effective single predictor of emergent leadership. This finding agrees with previous studies (Stogdill, 1948; Mann, 1959; Bass, 1960; Hare, 1962; Selover, 1962; McGrath and Altman, 1966; and Gibb, 1969) which indicated that effective past behavior is a key predictive element of future behavior.

The reason for the effectiveness of grade point average as a predictor of emergent leadership probably results from its interrelation with intelligence, motivation, and a disciplined set of behaviors which result in task
completion and/or goal accomplishment. Achieving results in disciplined stages probably is reinforcing in itself, in addition to the reinforcement received from faculty expression of satisfaction for task accomplishments. Students seeking this type of reinforcement would logically be those who had experienced it in the past and were willing to do what was required to achieve it.

The second most effective predictor variable was found to be dogmatism, as measured by the Rokeach Dogmatism Scale. This variable was negatively related to leadership ratings. This result appears logical in light of the training program design, because the intent of the program is to require the students to handle ambiguity in a variety of forms. The premise for this is that managers must make decisions regarding scarce resources, including manpower, under conditions of uncertainty. Rokeach (1960) pointed out that those high in dogmatism would tend to resist making decisions about changes needed and would develop anxiety when faced with uncertainty. Because of the flexibility and openness of thinking required to help subordinates develop, it appears logical that those low in dogmatism, or higher in openness to new ideas, would be more effective in manager development and manager self-development. Mason (1971) found that those high in openness performed more effectively in interpersonal relations. It seems to follow, then, that the students with
high openness in the present study should be more effective in interpersonal relations and rank high in leadership.

Several skills involved in problem solving require higher amounts of openness. The ability to distinguish when things are not right is included in the problem definition and selection. Those not willing to accept new ideas and changes would not be able to look at all sides of the problem and would tend to select problems in line with their own views.

In effective problem solving, not only must many alternatives be generated, but a wide range of potential resources identified. Problem solvers must be creative in choosing the activities important to gaining the desired outcome. Persons who were not open in their belief systems, according to Rokeach (1960), would not be effective in these behaviors. The reason for this is that their reception, evaluation, and actions on pertinent information received from the outside would be vitiated by their own closed belief systems. This would also be true of the data search and collection aspect of problem solving. Those not open in their belief systems would be searching for, and collecting information within, their personal socio-culturally biased frameworks. In research, it is known as experimenter bias or error. Another aspect of problem solving is handling information in complex ways.
To do this, the problem solver must reconcile his values in the face of measuring alternatives that are not measured in the same units. His openness to multiple solutions is paramount for effective goal accomplishment.

Activity, the third variable selected in the stepwise regression analysis, is another of those measures found identified in previous studies as significant in identifying leaders vs. non-leaders. The significant results of activity appear to be similar to findings of Julian (1963), Webber (1966), and Guyton (1969), who studied managerial and administrative effectiveness in various organizations. The nine-step systems-analysis approach required the groups' active production of products every three or four days for presentation to their respective faculty evaluation boards.

This involved generation, collection, and collation of data on time for acceptance, and permission to proceed to the next step. This means that charts, graphs, slides, and other visual aids had to be made without delay. In addition, rehearsing oral presentations, integrating separate written assignments, and preparing rebuttal for evaluation questions was necessary. Students in groups who talked about problem solving, but did not produce, received negative reinforcement or punishment, leading to increased anxiety. Students who successfully completed requirements received positive reinforcement or reward,
leading to anxiety reduction. Those persons most effective in exerting effort and influence toward goal accomplishment would appear to be held in esteem, or in positions of value—in this case, selected as leaders, or receiving an inordinately high ranking of leadership by their peers.

The failure to confirm the hypothesis of the significant relationship of dominance to emergent leadership probably could be attributed to the requirements of the program, or to the high intercorrelation between this variable and several other variables. The complex nature of the project requirements in this program are different than the requirements in most studies where dominance was significant. In those studies, the task was of short duration (20 minutes to 3 hours), as compared to the present study of six weeks. Dominance, in the tasks of short duration, could be an important factor when a "take charge" person is needed for task accomplishment. This is especially true of the small, initially leaderless discussion groups, where dominant persons speak up with authority and are elected leaders. As the groups progress through the six-week project of the present program, project success depends on a knowledge of various aspects of systems analysis, related business elements, the flexibility to change directions when required, and active completion of tasks. A dominant person without such knowledge, or other charac-
teristics needed, would not exert the influence that he might in a group not requiring such rigor and standards of performance over a shorter period of time.

The failure of the portion of the hypothesis dealing with Machiavellianism might be related to the difference between most Machiavellian studies and the present one. The hypothesized relationship between Machiavellianism in previous study groups and Machiavellianism in the present study was based on three conditions that seemed to be similar: (1) face-to-face interaction; (2) freedom to improvise and respond freely; and (3) arousal of emotion permitted when the experiment had serious consequences. These hypothesized conditions apparently were not present in the current study to the same degree as in previous ones. There could have been some lack of goal clarity, also. Although the students knew there would be some possible grade change if rankings were high enough, it was not spelled out what those standards were. In other words, there was not a clear-cut "prize" to win in deference to the others in the group. Thus the present study would not seem as likely to encourage a "zero-sum" game, which is typical behavior of the Machiavellian. Had the groups interacted together for various phases, the Machiavellian may have had an opportunity to impress his co-workers by manipulating members of other groups to gain resources external to his own group.
Another reason could be the length of the projects. Christie and Geis (1970) admit that their situation studies were brief, and typical high Machs achieved their success in from 5 minutes to a few hours. The fact that high Machs may be equally effective in a project of much longer duration, such as the present study of six weeks, is more speculative. This speculative nature might be in the form of intervening variables not present in projects of short duration, but present in this study.

If the model of hypothesized interaction between the Mach and situations with predicted tactics, proposed by Christie and Geis (1970), was relevant, Machiavellianism should have been significant. This model says that high Machs in a loosely-structured situation would: (1) limit testing; (2) initiate and control the structure; and (3) instrumentally exploit the resources. On the other hand, high Machs in a highly-structured situation would work within the system and exhibit perfunctory performance with occasional apathy. The hypothesis of significance for Machiavellianism in the present study was based on the premise that the groups were operating as loosely structured (exact role behavior or participant not predefined, exact means to achieve goals not predefined, and improvisation required). In effect, it may have been a perception of those in the groups that they were, to a higher degree, actually in a more highly-structured
direction (role and reward structure clear and predefined, exact responsibilities and means to achieve goals pre-defined, and little improvisation required). If this were true, it may well be that high Machs, instead of striving for group leadership, used their talents to get others to do most of the work on the projects, which the high Machs perceived as a higher "pay-off" in this situation. In this way, they would receive the same grade, but have more free time to work on other academic subjects.

Intelligence did not show a significant relationship to emergent leadership. This is probably due to the make-up of the groups and, to some extent, the tasks they had to perform. The groups were fairly homogeneous—i.e., all college students—hence intelligence was not very diverse throughout the groups. Most results reported by Wonderlic (1970) show standard deviations of 7 to 8; the present study was 4.7. Also, the minimum level of intelligence needed to effectively accomplish these tasks was probably adequately met by everyone in the group.

The choice of a leader, then, probably did not depend so much on the person who showed the highest ability to solve a particular problem, but depended on the person who could actively put together a program, see it completed, and had the flexibility to try a new set of behaviors if faculty feedback so directed. Although this requires a certain minimum level of intelligence, it requires other
characteristics that were more important for effective
goal accomplishment in this task. This is substantiated
somewhat by the fact that another variable, problem solv­
ing, as measured by the Ship Destination Test, was not
related significantly to emergent leadership, but corre­
lated .53 with the mental ability scale.

Another reason might be that some of the variance
attributed to intelligence and problem solving already
was accounted for by the variable of grade point average.

Two variables that were close to significance, but
not reported in the stepwise regression, were conformity
(a negative correlation) and interest in biological sci­
ence. It is most likely that the variance attributed to
conformity had been accounted for previously by dogmatism,
which was the second strongest predictor. No reasonable
explanation for the relation between interest in biolog­
ic science and emergent leadership can be offered,
however, since this variable was not significant enough
for inclusion in the multiple R. It might be concluded
that this variable appeared as significant because it was
highly related to other predictor variables.
CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This investigation was conducted to determine the relationship between several potential predictor variables and emergent leadership, as measured by peer ratings obtained in an experimental management training program.

Students in a university Management Department were introduced to a new training program involving experience in decision making, problem solving, role behavior, and presentation skills. A major portion of this program consisted of working in small groups toward task accomplishment in a reward/punishment environment—i.e., grades.

Knowledge about potential predictor variables was needed for information regarding program design and descriptions of students who were successful in the program.

The purpose of the training program was to let students experience, in an academic environment, the behaviors and skills that are assumed to be needed for effective managerial performance. In the portion of the program under study, a multifaceted, complex task was assigned to give the students experience in problem solving and decision making through a systems analysis.
approach to goal accomplishment. They participated in group activities with peers and received evaluation by a superordinate faculty board which gave them experience and skills in role behavior analysis.

The development of presentation and communication skills was necessary to transmit information of goal accomplishment and proposed program implementation to the supra organization.

Knowledge of potential predictor variables might enable those responsible for program design to alter the program structure by changing inputs. For example, a failure of the hypothesis of grade point average to be confirmed would require examination of task difficulty.

Knowledge of the variables should also lead to decisions regarding the recruitment, selection, and distribution of students in project groups. In addition, decisions regarding the amount of counseling and coaching needed on an individual or group basis might be determined. Course content could be enriched, diminished, varied; even faculty changes could be made as needed.

Research results from previous studies have indicated several variables that might be predictive of leadership behavior. The variables were: intelligence, dominance, grade point average, and Machiavellianism. The purpose of this investigation was to determine if these variables and/or other variables were predictive of emer-
gent leadership in this Management Department training program. A committee agreed upon eight standard instruments to measure potential predictor variables to determine possible relationships. The instruments were administered to 70 members of an undergraduate management class prior to the investigation.

During the Fall 1971 semester, the 70 students were randomly divided into initially leaderless groups of six to eight persons. They were assigned a task lasting six weeks. Upon completion, they were redivided into different groups for another six-week task.

The groups received instructions on a step-by-step systems analysis procedure and were expected to utilize it for project completion. After designated steps, the groups were required to make presentations of their progress to a faculty evaluation board before proceeding to the next step. At the end of the project, a final formal presentation was required.

Members completed peer evaluations at two-week intervals ranking peers on perceived leadership rank from highest to lowest, omitting themselves. Ranks were reported in $z$ scores and all six ratings over the two projects were averaged to obtain the criterion variable.

Students' grades were based on the completed project grades and adjusted up or down by high positive or negative $z$ scores on peer ratings.
Thirty potential predictor variables were intercorrelated with each other and emergent leadership. A multiple regression analysis determined the sequential strength of predictor contribution to the total multiple $R$. The hypothesis for grade point average was confirmed beyond the .05 level, but those for intelligence, dominance, and Machiavellianism were not.

This study has analyzed and evaluated the relationship between potential predictor variables and emergent leadership in an applied setting. The result provides knowledge about potential predictor variables in a situation which was initially leaderless. Reward or punishment came from either peers or the faculty board. Variables measurements were taken from standardized instruments that could be used for replication of the study with another student group in the same program. Or, the program could be reconstructed in another academic setting, with another population of students, using the same measurement instruments.

The results of the study could be used in an applied manner to change the program design and content, in addition to decisions about student selection and placement.

With these results, a managerial training matrix could be developed as one of the facets of a total management education program.
Conclusions

Insofar as the techniques used in this study may be valid, the following conclusions appear to be justified.

1. The results showed that the best potential predictor in the present study was reported grade point average, which was significant beyond the .05 level. This suggests that students who were successful in this program were the same students who have been consistently successful in other course work in the university. Encouraging students with higher GPA's to enter the program would aid in acquiring and maintaining strong competition for leadership in the task-oriented groups. Maintaining a program that required behaviors of high GPA's would mean that tasks could be kept complex and educationally meaningful. Students could be expected to work on problems requiring high alternative generation and analysis. This alternative could create a select group and reduce costs of training future groups. This is not a feasible alternative for this experiential program, however. A more acceptable alternative might be to put high GPA's in one group and low GPA's in others, thereby allowing low GPA's opportunities to become leaders of groups.

2. Those students low in dogmatism tended to be selected as leaders. In this study, they were those
students who were able to seek out new approaches and skills while abandoning or integrating old ones. Also, they were able to work under conditions of uncertainty and ambiguity found in situations requiring the learning and use of complex skills in a potentially threatening environment. Selection of those low in dogmatism might allow program planners to increase uncertainty aspects of the program.

3. Group members selected as leaders were those who exhibited high activity in working toward goal accomplishment. These were the ones who encouraged and assisted others to write, research, collate, integrate, and prepare materials for effective presentations to the faculty boards. They accomplished objectives on time and initiated activities for the next step in program planning. When group members have high activity levels, the size of the assigned projects—in addition to the complexity—can be increased. This increases activity levels and higher needs for creativity on the part of the faculty as well as the students.

4. Based on the findings, a person who tends to emerge as leader in the Management Department program
appears to be one who: (a) has demonstrated past successful performance; (b) is flexible; (c) is open to change and new ideas; (d) is somewhat non-conforming in behavior; and (e) has a propensity to exert effort toward task completion.

Recommendations for Future Program and Further Research

The following recommendations for program development are based on the findings of this investigation.

1. Students with high GPA's should be identified in the prerequisite Management Fundamentals class, and resources allocated to recruit them into the program. Selection procedures should not eliminate low GPA's at this time, however; they should be made aware of the potential competition for leadership positions.

2. Students who enter the program with low GPA's, high scores on dogmatism, and evidence of low activity rates should be provided with individual and group consultations, in addition to enriched program content. Program designers should study the efficacy of distributing members according to the potential predictor variable results. Such distribution may cause intervening variable effects to arise that are not clear at this time.

The following recommendations for additional research
are based on the findings of this investigation.

1. A replication of the study in future groups should be made for cross-validation, utilizing the regression formula derived from the present study. This will aid in determining the value of the variables for predicting future leadership potential.

2. Future groups should have those persons scoring high and low on potential predictor variables distributed across groups experimentally, to cross-validate findings of this study.

3. A study of various small-group characteristics, such as group size, should be made for contributions to program design. Smaller or larger groups may show relationships not present in this study.

4. A replication of the study should be made, using a combination of observed leadership rankings by the faculty and peer evaluations as the criterion variable. This may bring out intervening variable aspects of the dependent variable not present in this study.
BIBLIOGRAPHY


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Dubno, Peter, "Group Congruency Patterns and Leadership Characteristics." Personnel Psychology, XXI (Autumn 1968), 335-44.


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FIRST TEN STEPS FROM THE STEPWISE MULTIPLE REGRESSION ANALYSIS

Step Number 1—Reported Grade Point Average
F Level 11, 6491
Standard error of estimate = 69.9974
Coefficient of determination = 0.14626
Coefficient of multiple regression = 0.38243
Increase in coefficient of determination = 0.14626
Constant -167.2371

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Step Number 2—Dogmatism
F Level 6.2630
Standard error of estimate = 67.4363
Coefficient of determination = 0.21924
Coefficient of multiple regression = 0.46823
Increase in coefficient of determination = 0.07298
Constant -43.76868

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Step Number 5—Support

F Level 3.5988
Standard error of estimate = 63.0997
Coefficient of determination = 0.34703
Coefficient of multiple regression = 0.58910
Increase in coefficient of determination = 0.03672
Constant -75.44560

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Step Number 6—Biological Science

F Level 3.1876
Standard error of estimate = 62.0481
Coefficient of determination = 0.37848
Coefficient of multiple regression = 0.61521
Increase in coefficient of determination = 0.03145
Constant -105.3410

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Step Number 7—Impulsive

F Level 3.4879
Standard error of estimate = 60.8581
Coefficient of Determination = 0.41158
Coefficient of multiple regression = 0.64155
Increase in coefficient of determination = 0.03310
Constant -43.22168

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Step Number 8—Age

F Level 1.4073
Standard error of estimate = 60.6592
Coefficient of determination = 0.42485
Coefficient of multiple regression = 0.65181
Increase in coefficient of determination = 0.01327
Constant -122.5696

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Step Number 9—Machiavellianism

F Level  1.7858
Standard error of estimate  = 60.2722
Coefficient of determination  = 0.44148
Coefficient of multiple regression  = 0.66444
Increase in coefficient of determination  = 0.01662

Constant  -252.3017

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Step Number 10—Independence

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F Level 1.2522

Standard error of estimate = 60.1459
Coefficient of determination = 0.45308
Coefficient of multiple regression = 0.67312
Increase in coefficient of determination = 0.01161

Constant -224.4618

Source: Computer Program from Western Michigan University Computer Center Library Program, #1.3.2, Stepwise Regression.
LIST OF POTENTIAL PREDICTOR VARIABLES STUDIED*

A. **N.A. Scale**
   (1) Need achievement
B. **Mach V**
   (2) Machiavellianism
C. **Ship Destination Test**
   (3) Logical reasoning
D. **Wonderlic**
   (4) Intelligence
E. **Rokeach Dogmatism Scale**
   (5) Dogmatism
F. **Survey of Interpersonal Values (SIV)**
   (6) Support
   (7) Conformity
   (8) Recognition
   (9) Independence
   (10) Benevolence
   (11) Leadership
G. **Thurstone Temperament**
   (12) Active
   (13) Vigorous
   (14) Impulsive
   (15) Dominant
   (16) Stability
   (17) Sociable
   (18) Reflective
H. **Thurstone Interest**
   (19) Physical science
   (20) Biological science
   (21) Computational science
   (22) Business
   (23) Executive
   (24) Persuasive
   (25) Linguistic
   (26) Humanitarian
   (27) Artistic
   (28) Musical
I. **Demographic Variables**
   (29) Age
   (30) Grade point average

*Variable identification numbers in statistical procedures.*

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