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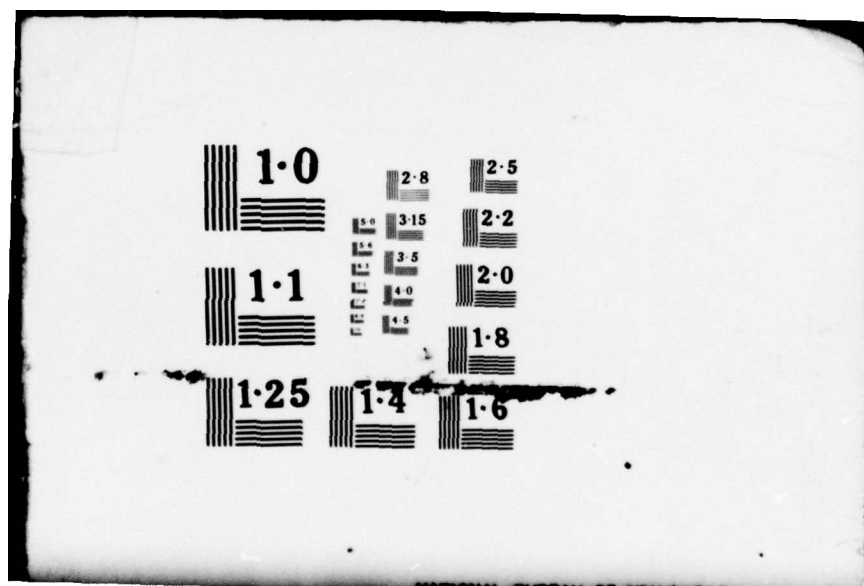
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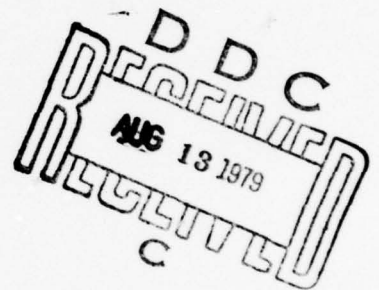
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AN ANALYSIS OF LEADERSHIP EFFECTIVENESS
IN THE NAVAL SURFACE COMMUNITY

by

Bradley J. Kaplan

June 1979

Thesis Advisor:

John Senger

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79 08 10 043

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) An Analysis of Leadership Effectiveness in the Naval Surface Community		5. TYPE OF REPORT & PERIOD COVERED Master's Thesis; June 1979
7. AUTHOR(s) Bradley J. Kaplan		6. PERFORMING ORG. REPORT NUMBER
9. PERFORMING ORGANIZATION NAME AND ADDRESS Naval Postgraduate School Monterey, California 93940		8. CONTRACT OR GRANT NUMBER(s)
11. CONTROLLING OFFICE NAME AND ADDRESS Naval Postgraduate School Monterey, California 93940		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) Naval Postgraduate School Monterey, California 93940		12. REPORT DATE June 1979
		13. NUMBER OF PAGES 81
		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This study attempts to provide empirical data which will show how and to what extent specific styles of leadership may maximize the performance and retention of units within the Navy. The study focuses upon a sample of twenty comparable destroyers and frigates within the Pacific Fleet. Leadership-style data were collected from the first and second officers in command of these units (CO and XO) by means of Fleishman's Leadership Opinion		

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→ The results of this study indicate that the CO either tends to perform both the task-related and socio-emotional functions, or the CO and XO appear to divide these functions, with the CO performing the socio-emotional function, and the XO performing the task-related function. The results also indicate that the leadership styles of the CO and XO appear to exert the most influence upon overall mission readiness and retention, while unit training readiness appears to be unrelated to the leadership style of either the CO or XO. More specifically, the task-related emphasis of both the CO and XO was found to have a significant positive correlation with overall unit readiness. Further analysis indicated that the CO's task-related emphasis has a significant positive correlation with unit personnel readiness, while the task-related emphasis of the XO has a significant positive correlation with both unit supply and equipment readiness. Finally, the socio-emotional emphasis of the CO, and to a lesser extent the XO, was found to have a significant positive correlation with unit retention. These results suggest that units are likely to be most effective with respect to performance and retention when the first and second in command are high in both the socio-emotional and task-related dimensions.

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6 An Analysis of Leadership Effectiveness
in the Naval Surface Community

by

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Lieutenant, United States Navy
B.A., University of New Mexico, 1974

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

12 82 p

from the

9 Master's
thesis

NAVAL POSTGRADUATE SCHOOL

11 June, 1979

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ABSTRACT

This study attempts to provide empirical data which will show how and to what extent specific styles of leadership may maximize the performance and retention of units within the Navy. The study focuses upon a sample of twenty comparable destroyers and frigates within the Pacific Fleet. Leadership-style data were collected from the first and second officers in command of these units (CO and XO) by means of Fleishman's Leadership Opinion Questionnaire (LOQ), a self administering inventory which measures two important dimensions of leadership behavior: consideration, relating to the leader's degree of socio-emotional emphasis; and structure, relating to the leader's degree of task-related emphasis. These leadership-style data were compared with six measures of unit effectiveness: overall mission readiness (OVL), personnel readiness (PER), supply readiness (SUP), equipment readiness (EQP), training readiness (TNG), and retention (RET). These measures were collected for a six month period in which the CO and XO of each unit had functioned as a "dual leadership" team.

The results of this study indicate that the CO either tends to perform both the task-related and socio-emotional functions, or the CO and XO appear to divide these functions, with the CO performing the socio-emotional function, and the XO performing the task-related function. The results also indicate that the leadership styles of the CO and XO appear

to exert the most influence upon overall mission readiness and retention, while unit training readiness appears to be unrelated to the leadership style of either the CO or XO. More specifically, the task-related emphasis of both the CO and XO was found to have a significant positive correlation with overall unit readiness. Further analysis indicated that the CO's task-related emphasis has a significant positive correlation with unit personnel readiness, while the task-related emphasis of the XO has a significant positive correlation with both unit supply and equipment readiness. Finally, the socio-emotional emphasis of the CO, and to a lesser extent the XO, was found to have a significant positive correlation with unit retention. These results suggest that units are likely to be most effective with respect to performance and retention when the first and second in command are high in both the socio-emotional and task-related dimensions.

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I. INTRODUCTION

"When men lose trust and confidence in those who lead, order disintegrates into chaos, and purposeful ships into uncontrollable derelicts."

The Wall Street Journal, 14 May 1952

As long as there have been leaders, man has attempted to identify and describe the characteristics which differentiate the leader from his followers. Although early studies of leadership may be found in Plato's Republic and Confucius' Analects, the first empirical studies of leadership were not published until the beginning of the twentieth century (Fiedler, 1967). Throughout this century, behavioral scientists and researchers have attempted to define leadership, identify leadership functions, and determine the characteristics of effective leadership. Leadership has been studied in relationship to the physical and psychological traits of the leader, the situation and environment, and the psychological characteristics of the leader's followers. The growing importance of the study of leadership was aptly expressed by Stouffer in 1949:

"There are few practical problems facing social science more important than the study of leadership."

In view of this importance, it is ironic that we probably know more about the landscape of the moon, or of the contours of the deepest depths of the oceans, than we know about the dynamics of leadership.

For the United States Armed Forces in general, and more specifically, for the Department of the Navy, the study of

leadership has emerged as of critical importance. The Navy's involvement in the study of leadership may be traced to August of 1946, when Congress authorized the creation of the Office of Naval Research (ONR). Many prominent behavioral scientists and researchers have made significant contributions to the study of leadership while operating under grants from this office. Among these, we find research by Lewin (1947), Hemphill, Stogdill, and Shartle (1948), Campbell (1956), Fleishman (1957), and Fiedler (1967).

Unfortunately, the Navy has been singularly unsuccessful in utilizing this vast wealth of leadership research towards the development of a standardized, Navy-wide program of leadership training. In view of this lack of training, it is not surprising that the serious racial incidents aboard the aircraft carriers Constellation and Kittyhawk in 1970 were found to be directly attributable to ineffective leadership.¹ In the chaotic aftermath of these incidents, the Navy eventually developed the Leadership and Management Training (LMT) and the Leadership and Management Development (LMD) programs. These programs were designed to improve the effectiveness of leadership throughout the Navy by exposing officers and petty officers to contemporary theories and concepts of leadership effectiveness.

¹Report by the Special Subcommittee on Disciplinary Problems in the U.S. Navy of the Committee on Armed Services, 1973.

In spite of these training programs, leadership remains the most critical and time-sensitive problem facing the Navy. As the Soviet Navy continues to grow in scope and power, spiraling costs and budget cutbacks continue to reduce the quality and quantity of our Naval forces. As our manpower resources have steadily grown more scarce, attrition and desertion rates within the Navy have increased at an alarming rate, while no appreciable gains have been made in retention. If we are to effectively manage these dwindling resources, we must improve leadership within all levels of the Navy. The Chief of Naval Operations recently emphasized this need for improved leadership effectiveness within the Navy:

"The margin of superiority at sea our Navy can achieve over any potential future enemy may well be founded in the demonstrated leadership and management competence of our officers, petty officers, and civilians...Contemporary problems involving retention, crisis management, disciplinary rates, attrition, and working conditions...can be closely correlated to individual and organizational leadership and management problems."
Holloway, 1978

The ability of our leaders to meet this challenge is largely dependent upon the effectiveness of leadership training programs such as LMT and LMD.

The purpose of this study is to attempt to improve the quality and effectiveness of leadership throughout the Navy by providing empirical data showing how and to what extent specific styles of leadership may maximize both unit performance and personnel retention. The study focuses upon a sample of twenty comparable naval surface combatant units

led by a "dual leadership team" consisting of a commanding officer (CO) and executive officer (XO). A leadership style inventory was mailed to both the CO and XO of each of these units. This inventory provided a measure of two important dimensions of leader behavior: the degree of task-related and socio-emotional orientation. These leadership data were then compared with six measures of unit effectiveness: overall mission readiness (OVL), personnel readiness (PER), supply readiness (SUP), equipment readiness (EQP), training readiness (TNG) and retention (RET). The procedures used in this study will be described in greater detail in Chapter Three of this paper. Before describing these procedures, however, it is necessary to briefly review contemporary leadership research which relates to this study.

II. REVIEW OF THE LITERATURE

Stogdill (1974) has compiled an exhaustive review of leadership theories and concepts. This chapter, which draws extensively from Stogdill's work, provides a brief overview of contemporary leadership research as it relates to this study.

A. DEFINITIONS AND CONCEPTS OF LEADERSHIP

As a start, what is meant by the term leadership? A review of the literature reveals hundreds of definitions of leadership. Stogdill (1974) has organized these definitions into twelve perspectives of leadership: as a focus of group processes, as personality and its effects, as the art of inducing compliance, as the exercise of influence, as an act or behavior, as a form of persuasion, as a power relation, as an instrument of goal achievement, as the effect of interaction, as a differentiated role, as the initiation of structure, and as a measure of effectiveness. A representative definition for each of these perspectives is provided in Table 2-1. While these definitions somewhat limit our perspective of leadership, they are by no means all inclusive; for leadership embraces each of these perspectives as well as others.

TABLE 2-1

DEFINITIONS OF LEADERSHIP

1. Leadership as a focus of group process:
"The leader serves as a primary agent for the determination of group structure, group atmosphere, group goals, group ideology, and group activities."
Krech and Crutchfield, 1948
2. Leadership as personality and its effects:
"A social process involving a number of people in mental contact in which one person assumes dominance over the others."
Bogardus, 1934
3. Leadership as the art of inducing compliance:
"The ability, based on the personal qualities of the leader, to elicit the followers' response in a broad range of matters."
Etzioni, 1965
4. Leadership as the exercise of influence:
"Attempts at interpersonal influence, directed through the communications process, towards the attainment of some goal or goals."
Fleishman, 1974
5. Leadership as an act or behavior:
"The particular acts in which the leader engages in the course of directing and coordinating the work of his group members."
Fiedler, 1967
6. Leadership as a form of persuasion:
"The activity of persuading people to cooperate in the achievement of a common objective."
Koontz and O'Donnell, 1955

7. Leadership as a power relation:
"When the goal of one member, A, is that of changing another, B, or when B's change in behavior will reward A or reinforce A's behavior, A's effort to obtain the goal is leadership."
Bass, 1960
8. Leadership as an instrument of goal achievement:
"The human factor which binds a group together and motivates it towards its goals."
K. Davis, 1962
9. Leadership as the effect of interaction:
"A process of mutual stimulation, which, by the successful interplay of individual differences, controls human energy in the pursuit of a common cause."
Figors, 1935
10. Leadership as a differentiated role:
"A role within the scheme of relations...defined by reciprocal expectations between the leader and the other members."
Sherif and Sherif, 1956
11. Leadership as the initiation of structure:
"The initiation and maintenance of structure in expectation and interaction."
Stogdill, 1959
12. Leadership as a measure of effectiveness:
"The contribution of a given individual's group effectiveness, mediated through the direct influence of others rather than himself."
Campbell, 1956

B. CONTEMPORARY THEORIES OF LEADERSHIP

Over the past three decades, leadership has been extensively analyzed from many different perspectives. A review of the literature suggests that these studies tend to fall within one of four theoretical approaches to leadership:

- 1.) Trait theories - early 1900's to the present.
- 2.) Behavioral theories - late 1940's to the present.
- 3.) Situational theories - late 1950's to the present.
- 4.) Dual leadership theories - early 1960's to the present.

1. Trait Theories

The trait theories of the early 1940's appear to have evolved from the "great man" theories of leadership (Borgotta, Couch, and Bales, 1954) which sought to account for the emergence of leadership. These trait theories attempt to identify the physical and psychological attributes which differentiate leaders from followers. These attributes include the leader's physical characteristics, social background, intelligence and ability, personality, and task and socially related characteristics. Stogdill (1974) reviewed 163 studies of leadership dating from 1948 to 1970. Traits which were found to have a significant positive correlation with leadership in ten or more of the studies are summarized in Table 2-2. The results of Stogdill's analysis suggest that interpersonal skills, dominance, self confidence, and intelligence are attributes which frequently characterize the effective leader.

Despite these findings, the trait approach has been largely unsatisfactory. Stogdill (1974) points out that the trait approach has been of little value in leadership selection

TABLE 2-2

LEADERSHIP TRAITS 1948-1970 (163 STUDIES)

Trait	Number of studies in which Trait was found to be Significant
Sociability, interpersonal skills	35
Ascendance, dominance	31
Self confidence	28
Intelligence	25
Activity, energy	24
Achievement drive, desire to excell	21
Social status	19
Drive for responsibility	17
Administrative abilities	16
Fluency of speech	15
Emotional balance, control	14
Education	14
Independence, non-conformity	13
Task orientation	13
Originality, creativity	13
Knowledge	12
Agressiveness, assertiveness	12
Adjustment, normality	11
Enterprise, initiative	10

Source: Stogdill, 1974

because many traits appear to differentiate leaders from followers, the traits demanded in a leader vary from one situation to the next, and because the trait approach fails to consider the interaction between the leader and his followers. Moreover, there appears to be little agreement among behavioral researchers as to which leadership traits are predominant. Gibb (1954) points out that the many studies of leadership traits have failed to find any consistent pattern which characterizes the leader. Nevertheless, Gibb does concede that the lack of consistent correlation between leaders and leadership traits does not necessarily indicate that none exists. As of yet, however, this correlation has not been established.

2. Behavioral Theories

By the late 1940's, the emphasis of leadership research had begun to shift from the study of leadership traits to the study of leadership behavior, or style. These behavioral theories attempt to establish a relationship between the leader's effectiveness and his behavior patterns. These patterns have been found to be relatively consistent and enduring over time. In a study of twenty Naval officers, Stogdill, Scott, and Jaynes (1956) found a significant tendency for patterns of leadership behavior to be transferred from one position to another. Borgotta (1964), Borg and Tupes (1958), and Blake, Mouton, and Fruchter (1954), found considerable consistency of behavior in the same leader performing in different groups with varying tasks.

Over the past three decades, the majority of leadership research has been devoted to identifying and clarifying the critical dimensions of leadership behavior. A summary of the major studies in leadership behavior is provided in Tables 2-3 through 2-5. Although hundreds of dimensions have been identified, factor analytic studies (Halpin and Winer, 1957; Stogdill, 1974) indicate that two critical dimensions consistently characterize leadership behavior. The first dimension is composed of democratic, permissive, follower-oriented, participative, and considerate patterns of behavior which appear to relate to the leader's socio-emotional orientation. The second dimension consists of autocratic, restrictive, socially distant, directive, and structured patterns of behavior which appear to relate to the leader's task orientation. Senger (1971) suggests that these task and socio-emotional orientations are related to two important personality variables: the need for achievement and the need for affiliation.

As can be seen in Table 2-6, a significant number of leadership studies have identified two critical dimensions of leader behavior. Although early researchers believed that task and socio-emotional patterns of behavior were mutually exclusive leadership styles, more contemporary research has shown that the leader can be high or low in both dimensions (Hersey and Blanchard, 1972). Many early researchers theorized that the leader will be most effective when he exhibits a high degree of both task-related and

TABLE 2-3

LEADERSHIP DIMENSIONS - OHIO STATE STUDIES

<u>Year</u>	<u>Researchers</u>	<u>Dimensions</u>
1948	Stogdill and Shartle	Personnel considerations, communication, negotiation, evaluation, inspection, coordination, scheduling, technical, supervision, research, planning, public relations.
1950	Hemphill and Coons	Fraternization, communication, evaluation, integration, organization, domination, initiation, production emphasis, representation.
1951	Hemphill, Seigel, and Westie	Consideration, structure.
1956	Stogdill, Scott, and Jaynes	Writing, consulting, coordination, scheduling, supervising, planning.
1957	Hemphill and Coons	Maintenance of membership character, group integration facilitation behavior, objective attainment behavior.
	Halpin and Winer	Consideration, structure.
1959	Stogdill	Consideration, persuasiveness, influence, integration, conflict resolution, tolerance of uncertainty and freedom, role retention, initiating structure, production emphasis, conceptual skill, representation.
1960	Halpin and Croft	Consideration, aloofness, thrust, production emphasis.

TABLE 2-4

LEADERSHIP DIMENSIONS-UNIVERSITY OF MICHIGAN STUDIES

<u>Year</u>	<u>Researchers</u>	<u>Dimensions</u>
1950	Katz	Employee orientation, production orientation.
1951	Katz and Kahn	Employee orientation, group relationships, closeness of supervision, differentiation of supervision.
1958	Kahn	Provide direct need satisfaction, Modify employee goals, enable goal achievement, structure the path to goal attainment.
1960	Kahn	Employee oriented, goal setting, planning, mission oriented.
	Cartwright and Zander	Group maintenance functions, goal achievement.
1961	Likert	Job centered, employee centered.
1966	Bowers and Seashore	Support, interaction facilitation, work facilitation, goal emphasis.

TABLE 2-5

LEADERSHIP DIMENSIONS - BEHAVIORAL LITERATURE

<u>Year</u>	<u>Researchers</u>	<u>Dimensions</u>
1955	Schutz	Power orientation, personnel orientation.
1957	Fleishman	Consideration, structure.
1958	Bales	Task specialization, social specialization
1961	Flanagan	Administrative management, technical, supervising, planning, organizational responsibility, personal responsibility.
1962	Krech, Cruchfield, and Ballachey	Task specialization, maintenance specialization.
1964	Fiedler	Task orientation, relationship orientation
	Blake and Mouton	Concern for people, concern for production
1965	Etzioni	Instrumental leadership, expressive leadership.
1966	Katz and Kahn	Interpretation of structure, utilizing formal structure, supervision, introduction of structural change, policy making, conceptual ability.
1969	Hersey and Blanchard	Democratic, persuasive, laissez faire, task directed.
1971	Filley and House	Authoritarian behavior, supportive behavior.
	House	Instrumental, support, participative, and achievement orientation behavior.

- 1971 Jacobs Interpersonal skills, communication, bargaining, timing, work facilitation, individual ethics.
- 1972 Hersey and Blanchard Task Behavior, relationship behavior.

TABLE 2-6

BI-DIMENSIONAL THEORIES OF LEADER BEHAVIOR

<u>Year</u>	<u>Researchers</u>	<u>Dimensions</u>
1950	Katz	Production orientation, employee orientation.
1954	Halpin	Structure and consideration.
1955	Schutz	Power orientation, personnel orientation.
1958	Bales	Task specialization, social specialization.
1961	Likert	Job centered, employee centered.
1962	Krech, Crutchfield, and Ballachey	Task specialization, maintenance specialization.
1964	Blake and Mouton	Concern for production, concern for people.
1965	Etzioni	Instrumental leadership, expressive leadership.
1967	Fiedler	Task orientation, relationship orientation.
1972	Hersey and Blanchard	Task behavior, relationship behavior.

socio-emotional behavior (Fleishman, 1957; Blake and Mouton, 1964), however more recent studies have indicated that there appears to be no single all-purpose leadership style which will be effective in all situations (Fiedler, 1967; Hersey and Blanchard, 1972).

3. Situational Theories

In an attempt to develop more comprehensive perspectives of leadership effectiveness, more recent research has begun to focus upon situational factors, as well as leadership behavior. These situational factors include leader and follower needs, motives, and expectations, group structure and tasks, and organizational characteristics. A summary of major situational studies of leadership from the late 1950's to the present is provided in Table 2-7.

Much of this situational research has focused upon the needs and motives of the leaders followers. Expanding upon earlier research by Maslow (1954) and Herzberg (1959), McGregor (1960) developed two theories of organizational leadership. Theory X, based upon traditional management and military concepts, assumes that people are passive and resistant to organizational needs, and postulates that highly structured and directive behavior patterns will be the most effective leadership style. Theory Y on the other hand, is based upon the assumption that people are motivated to work and desire responsibility, and postulates that participative and democratic patterns of behavior will be the most effective leadership style. Argyris (1961) and Likert (1961) have

TABLE 2-7

SITUATIONAL APPROACHES TO LEADERSHIP

<u>Year</u>	<u>Researchers</u>	<u>Situational Factors</u>
1954	Maslow	Leader and follower needs.
1959	Herzberg	Follower needs and motivation.
	Stogdill	Follower expectations.
	French and Raven	Leader power.
1960	Bass	Follower expectations.
	McGregor	Follower needs and motives.
	Vroom	Leader and follower perceptions.
1961	Bennis	Organizational characteristics and processes.
	Likert	Follower expectations and values.
	Argyris	Follower needs and organization processes.
	Halpin and Croft	Group structure and size.
1964	Blau	Leader status.
1965	Porter and Lawler	Organizational structure.
1967	Fiedler	Leader position power, task structure.
1970	Evans	Follower perceptions.
1971	House	Follower needs and motivation.

developed leadership theories which suggest that the leader will be most effective when he develops and maintains subordinate creativity and cooperation by allowing his followers to participate in the decision making process and in the direction of group activity.

Another group of situational theories focuses upon the interaction between the leader and his subordinates. Stogdill's Expectancy-Reinforcement theory (1959) suggests that the leader's effectiveness is contingent upon the degree to which he initiates and maintains structure in follower interaction and expectation. Fiedler's Least Preferred Co-worker (LPC) theory (1964) suggests that three factors in interacting groups influence leader effectiveness: position power, task structure, and leader/follower interpersonal relations. Fiedler postulates that leaders who exhibit a high degree of socio-emotional orientation (high LPC) will obtain more effective group performance in situations which impose moderate demands, and that leaders who exhibit a high degree of task orientation (low LPC) will obtain more effective group performance in situations which impose either high or low demands. Evans' Path-Goal theory (1970) and House's Motivational theory (1971) suggest that the leader will be effective to the extent to which he can clarify his followers' perceptions of the awards available to them, and in turn, structure the path to the attainment of these rewards.

Finally, several situational studies have focused upon the power associated with the leader's position. Blau

(1964) points out that the leader receives satisfaction from his position of status, and in return, the leader's followers receive satisfaction from affiliation with a person of high status. French and Raven (1959) identified five types of leadership power: reward power, associated with the leader's ability to provide or withhold rewards to his followers, coercive power, associated with the leader's ability to punish his followers, legitimate power, associated with the authority delegated to the leader, referent power, associated with the leader's "charisma," and expert power, associated with the leader's knowledge and expertise.

4. Dual Leadership Theories

The trait, behavioral, and situational approaches analyze leadership effectiveness in relationship to the attributes, leadership style, and situational factors relating to a single leader within the group. Dual leadership theories, which emerged from research by Bales (1958), Etzioni (1965), and Burke (1967), attempt to establish a relationship between group effectiveness and the behavior of two leaders who have collective line authority over the group's members. Senger (1971) suggests that the practice of dual leadership emerged as a consequence of the dichotomous demands which are imposed upon the leader. Task-related demands appear to require that the leader pursue organizational goals at the expense of subordinate needs for satisfaction and group cohesion. Conversely, socio-emotional demands appear to require that the leader emphasize subordinate satisfaction and

group cohesion at the expense of organizational goals. Occasionally, an individual possesses the capabilities to assume both leadership functions: (The "great man" leader) however, more frequently, these dichotomous demands appear to be resolved by dividing these functions between two members of a unit, with one member performing the task-related function and the other performing the socio-emotional function.

Dual leadership has been found to an increasing extent in both public and private sectors (Schonberger, 1974). The Navy and the Army appear to have adopted this concept of dual leadership to varying extents. Within the Army, dual leadership is reflected in the relationship between the platoon commander, who generally performs the socio-emotional function, and the platoon sergeant, who generally performs the task related function (Etzioni, 1965). Within the Navy, anecdotal evidence suggests that the commanding officer generally performs the socio-emotional function, and the executive officer generally assumes the task-related function. In an unpublished study of Naval Officers who had served in 312 separate commands during their careers, Senger (1971) found that in 187 (60 percent) of the commands the task-related and socio-emotional functions were divided between the commanding and executive officers. Within these 187 commands so divided, the commanding officer assumed the socio-emotional, and the executive officer the task-related function, in 112 (37 percent) of the commands, and in the remaining 75 (23 percent) of the commands, the roles were

reversed. In the 125 commands in which these functions were not divided, the two officers both assumed the socio-emotional role in 29 (9 percent) of the commands, and the commanding officer assumed both roles in 59 (19 percent) of the commands.

Etzioni (1965) suggests that task oriented groups will be most effective when the group contains both task-related and socio-emotional leaders who interact in mutual support. Etzioni indicates that when the socio-emotional leader is missing, member satisfaction and work-group cohesion will be low. Conversely, when the task-related leader is missing, group productivity will be low. Finally, in groups where the task-related and socio-emotional leaders are in conflict, both group productivity and member satisfaction will be reduced.

C. LEADERSHIP EFFECTIVENESS STUDIES

Leadership effectiveness has been studied from many different perspectives. Stogdill (1974) and Bass (1966) view leadership effectiveness in relationship to group output, member satisfaction, and group cohesion. Fiedler (1967) views leadership effectiveness in relationship to group productivity, although he points out that group output is not entirely a function of the leader's skill, as unfavorable circumstances can create an "error variance" which may reduce the relationship between the leader's behavior and task-group performance. Other behavioral research has measured leadership effectiveness in relationship to subordinate, peer group, or supervisor ratings (Halpin, 1954; Campbell, 1956; Fiedler, 1965).

A great many leadership studies have measured leadership effectiveness in relationship to the leader's task-related and socio-emotional patterns of behavior. Industrial studies by Fleishman (1957) indicated that absenteeism, turnover, and grievances are negatively correlated with leader consideration, and positively correlated with leader structure. Research in a variety of situations indicates that leaders are more effective when they exhibit a high degree of both socio-emotional and task-related behavior. House, Filley, and Kerr (1971) found that subordinate satisfaction correlated positively with both leader consideration and structure. Fleishman and Simmons (1970) found that leaders high in both consideration and structure were the most effective, while those leaders low in both of these dimensions were the least effective. Several studies within the military have indicated that groups are more cohesive when the leader is high in both task-related and socio-emotional dimensions. In a study of air crew commanders, Halpin (1954) found subordinate satisfaction to be positively correlated with both leader consideration and structure.

Stogdill (1974) reviewed 174 studies which measured leader effectiveness in relationship to the leader's task-related and socio-emotional patterns of behavior and group productivity, satisfaction, and cohesion. The results of this review, which are summarized in Table 2-8, suggest that while both task and socially related leadership styles are likely to increase group productivity and cohesion, task

TABLE 2-8

SUMMARY OF STUDIES OF LEADERSHIP EFFECTIVENESS

<u>Dimensions</u>	<u>Direction of Correlation</u>		
	<u>Positive</u>	<u>Zero</u>	<u>Negative</u>
Productivity			
Task-related behavior	47	26	7
Socio-emotional behavior	47	32	14
Satisfaction			
Task-related behavior	14	8	11
Socio-emotional behavior	48	9	7
Cohesion			
Task related behavior	9	4	3
Socio-emotional behavior	20	5	6

Source: Stogdill, 1974

orientation is the more important behavior with respect to group productivity, while social orientation is the more important behavior with respect to group cohesion. Finally, socio-emotional patterns of behavior appear likely to increase subordinate satisfaction, while task-related patterns of behavior appear likely to decrease subordinate satisfaction.

Over the past three decades, leadership has been studied from many perspectives. The trait approach focuses upon the emergence of the leader in relationship to his physical and psychological attributes. The behavioral approach focuses upon leadership effectiveness in relationship to a broad range of situational factors, including leader style and position power, group structure, and follower needs and expectations. Finally, the dual leadership approach focuses upon leadership effectiveness in relationship to the leadership styles of two or more individuals who have collective line authority over a single group of subordinates.

In spite of this vast wealth of research, we find few significant studies of leadership within the military services. Within the Navy, Campbell's (1956) study of the leadership effectiveness of CO's and XO's in a submarine squadron appears to be the only major study of officer leadership. In view of the early date of this research, it would appear that the study of officer leadership within the Navy has been a relatively neglected area.

Contemporary research suggests that leader behavior may be analyzed in relationship to two dimensions: a task-related

and socio-emotional dimension. Moreover, recent research has indicated that groups are often led by two leaders; with one leader performing the socio-emotional function, and the other leader performing the task-related function. Anecdotal evidence within the Navy indicates that the CO generally performs the socio-emotional function, while the XO generally performs the task-related function. Based upon these findings, the following hypotheses were developed regarding the leadership style, unit performance, and retention data collected in this study:

- 1) Hypothesis number one:
CO's and XO's will differ significantly in leadership styles, with the CO tending to perform the socio-emotional function, and the XO the task-related function.

Hypothesis 1.1:

CO's will tend to be higher in the socio-emotional dimension (CS) than XO's (XS).

Hypothesis 1.2:

XO's will tend to be higher in the task-related dimension (XT) than CO's (CT).

- 2) Hypothesis number two:
The task-related dimension will have a significant correlation with unit performance, while the socio-emotional dimension will have a significant correlation with unit retention.

Hypothesis 2.1:

CT will have a significant positive correlation with overall (OVL), personnel (PER), Supply (SUP), equipment (EQP) and training (TNG) readiness.

Hypothesis 2.2:

XT will have a significant positive correlation with OVL, PER, SUP, EQP, and TNG.

Hypothesis 2.3:

CS will have a significant positive correlation with retention (RET).

Hypothesis 2.4:

XS will have a significant positive correlation with RET.

- 3) Hypothesis number three
With respect to unit performance and retention, the best possible combination of leadership styles will be when the CO and XO are high in both task-related and socio-emotional dimensions.

III. METHODOLOGY

This chapter provides an overview of the study, describes the characteristics of the sample used, the methods of data collection, and the procedures for the statistical analysis of data collected.

A. STUDY OVERVIEW

The objectives of this study were to determine the predominant leadership styles of the first and second officers in command of naval units and to assess the relationship between these styles and unit performance and retention. This study utilizes a "static correlation" design, which attempts to discover over comparable groups any correlations between the behavior of a given individual within the group (e.g., the leader) and the behavior of the group as a whole. This research design is particularly appropriate when there is assumed comparability between the groups being studied, and when the research is intended as an initial "sifting procedure," in which important relationships between leader behavior and group effectiveness are to be isolated, with further research to be applied to these relationships in order to determine causality.

The Navy is composed of many populations or communities. These communities include shore commands, aviation commands, surface combatant, amphibious, and auxiliary commands, and subsurface commands. This study focuses upon only one of

these populations - Naval surface combatants, a community which represents approximately 20 percent of the Navy's force manning level (Polmar, 1978).

Numerous methods were available for collecting leadership style and unit performance data for this study. Leadership style may be assessed by a wide variety of leadership inventories which may be completed by the leader himself, or by the leader's peers, superiors, or subordinates. Among these leadership inventories we find the Leader Behavior Description Questionnaire (Hemphill, Seigle, and Westie; 1951), the Leadership Opinion Questionnaire (Fleishman, 1957), the Managerial Grid (Blake and Mouton, 1964), the Least Preferred Co-worker Scale (Fiedler, 1967) and the Leader Effectiveness and Adaptability Description (Hersey and Blanchard, 1972). Although research has shown that each of these inventories is a relatively accurate indicator of leadership style, Fleishman's Leadership Opinion Questionnaire (LOQ) was chosen for this study, primarily because of its established reliability, brevity, and simplicity.

Finally, many indicators were available for assessing unit performance. These indicators include Naval Force Status Reports, refresher and team training scores, medical and non-judicial punishment records, various readiness inspections, weapons firing exercises, ship qualification trials, squadron efficiency awards, and retention statistics. This study used Naval Force Status Reports (NAVFORSTATE) as a measure of unit performance, and retention statistics as a measure of crew member satisfaction and morale. These

measures were selected because they are relatively objective, well suited for quantitative analysis, and readily attainable.

Data collection in this study was supported by the PERS 62 Division of the Navy Manpower and Personnel Command (NMPC) and the PERS 6-1 Division of Commander, Naval Surface Forces, Pacific (COMNAVSURFPAC). Leadership style data were obtained by mailing two copies of Fleishman's Leadership Opinion Questionnaire to the first and second officers in command of units within the Surface Force community. NAVFORSTAT performance data were provided by the Fleet Operations Readiness and Navy Command Support Center (OP-64). Retention data were collected from Commander in Chief Pacific Fleet (CINCPACFLT) quarterly retention reports. Both NAVFORSTAT and retention data were selected for a six month period in which the first and second officers in command of each unit had functioned as a "dual leadership" team for a minimum of six months (September, 1978 to February, 1979).

B. SAMPLE CHARACTERISTICS

1. Naval Units

The initial sample in this study was composed of fifty frigates (FF) and destroyers (DD) homeported at Naval Stations in San Diego and Pearl Harbor. This sample represents approximately 28 percent of the 179 surface combatant units in the Navy, and approximately 37 percent of the 138 frigates and destroyers in the Navy (Polmar, 1978). The operational characteristics of units within the sample are depicted in Table 3-1. As can be seen from this table, these

TABLE 3-1

SAMPLE CHARACTERISTICS BY SHIP TYPE

Class	Knox (FF)	Adams (DDG)	Forest Sherman (DD)
Displacement	4100 Tons	4500 Tons	4050 Tons
Length	438 Feet	437 Feet	418 Feet
Speed	27+ Knots	32 Knots	33 Knots
Officers	17	24	17
Enlisted	260	330	275
Missiles	BPDMS/Harpoon	Tartar/Standard	-
Guns	5"/54	5"/54	8"/55, or 5"/54, 3"/50
ASW Weapons	Asroc, SVTT	Asroc, SVTT	Asroc, SVTT
No. in Study	10	8	2

Data Source: Polmar, 1978

units are comparable in size, armament, operational characteristics, and complement. Of these fifty units, only twenty were eventually used in the study.

2. Dual Leadership Teams

Each of the units within the sample are led by a "dual leadership" team consisting of a commander (CO) and Lieutenant Commander (XO). The leadership roles and functions of the CO and XO are clearly delineated in Navy directives. The CO is tasked by these directives with the "responsibility for the safety, well being, and efficiency of his entire command...he shall exert every effort to maintain his command in a state of maximum readiness for war or...for the accomplishment of assigned missions" (Navy Regulations, 1974). The XO is "primarily responsible, under the CO, for the organization, performance of duty, and good order and discipline of the entire command...as such, all orders issued by the XO will have the same effect as though issued by the CO, and shall be obeyed accordingly by all members of the command" (Standard Organization and Regulation Manual of the Navy, 1974).

C. DATA COLLECTION

1. Performance Data

Performance data for units within the sample were based upon NAVFORSTAT reports and CINCPACFLT Quarterly Retention reports. The NAVFORSTAT reporting system allows unit commanding officers to provide both operational and administrative commanders with estimates of unit readiness

in various mission areas (OPNAVINST C3501.66A). These estimates, or readiness ratings, are submitted at periodic intervals, and whenever unit readiness in a specific warfare area changes significantly. These ratings are scaled from one, corresponding to complete mission readiness, to four, corresponding to complete mission degradation. NAVFORSTAT readiness ratings were obtained for each unit within the sample for a six month period. These ratings were weighted in accordance with the length of time each unit had been at a particular readiness level; and based upon these weighted values, a single readiness mean was computed. This readiness mean was then rescaled from forty, corresponding to complete mission readiness, to ten, corresponding to complete mission degradation. Weighted means were computed in five readiness areas:

- 1) Overall readiness (OVL): an estimate of overall unit readiness reflecting readiness in various mission areas including mobility, anti-air warfare, anti-submarine warfare, surface warfare, and command and control.
- 2) Personnel readiness (PER): an estimate of unit manning readiness based upon a comparison of present manning level with wartime (M + 12) allowance.
- 3) Supply readiness (SUP): an estimate of unit supply readiness based upon a comparison of supplies on hand with unit allowance.
- 4) Equipment readiness (EQP): an estimate of unit equipment readiness of mission essential equipment with mission requirements.
- 5) Training readiness (TNG): an estimate of unit training readiness based upon a comparison of completed training with type-commander training requirements.

Retention data for each unit within the sample were obtained from CINCPACFLT Quarterly retention reports. A

composite measure of unit retention was computed by consolidating first term, second term, and career enlisted retention statistics for a six month period. These data were then rescaled from 0, corresponding to 0% retention, to 99, corresponding to 99% retention.

2. Leadership Style Data

Leadership style data were obtained through the use of Fleishman's LOQ, a self administering leadership inventory. The LOQ consists of forty likert scaled questions which measure two dimensions of leadership behavior: consideration and structure. Consideration reflects the leader's degree of socio-emotional emphasis. A high score is indicative of close personal relationships between the leader and his subordinates, while a low score is indicative of more distant, impersonal relationships. Structure reflects the leader's degree of task-related emphasis. A high score indicates that the leader plays an active role in coordinating and directing the activities of his subordinates, while a low score indicates that the leader plays a less active role in supervising group activities.

Each of the questions in the LOQ describe specific aspects of leadership behavior. Twenty of the LOQ's questions measure the respondent's degree of socio-emotional emphasis, while the remaining twenty measure the respondent's degree of task-related emphasis. Alternatives for each of the questions are scaled from 0 to 4. For each question, the respondent is asked to select an alternative which best

reflects the degree to which he feels that he should exhibit a specific aspect of leadership behavior. As there are 20 questions in each dimension, the maximum possible score is 80, however, scores generally range from 30 to 70. Research in a wide variety of studies has indicated that these dimensions are independent, that is, the leader may be high in both dimensions, low in both dimensions, or high in one dimension and low in the other (Fleishman, 1969).

Findings in over twenty years of research have indicated that the LOQ is well suited for a study of this type. First of all, research has shown that the LOQ ranges in internal consistency reliability from .62 to .89, and in test-retest reliability from .67 to .80. Moreover, the halo and social desirability tendencies, common biases in inventories of this type, has been found to be minimal. Finally, research has shown that LOQ scores are not related to respondent personality, verbal ability, or intelligence (Fleishman, 1969).

In this study, it was necessary to modify the LOQ in order to more accurately assess the actual behavior which CO's and XO's were utilizing in leading their officers and crew. The respondents were therefore asked to select an alternative for each question which best reflected the degree to which they actually exhibited a specific aspect of leadership behavior, rather than the degree to which they felt they should exhibit this behavior.

D. STATISTICAL ANALYSIS

Statistical analysis of LOQ, performance, and retention data was accomplished with the aid of the statistical package for the social sciences (SPSS). Hypothesis 1 was tested by means of students' t-test. This test showed if the observed differences in the means for CO and XO leadership styles were due solely to sampling error, or to population differences, as well. The hypotheses (H1.1 and H1.2) to be tested correspond to the alternative (H1) forms of the following statistical hypotheses:

H 1.1

$$H_0: CT \geq XT$$

$$H_1: CT < XT$$

H 1.2

$$H_0: CS \leq XS$$

$$H_1: CS > XS$$

Mean values for CT, CS, XT, and XS were determined, and statistics were computed from these means and their corresponding standard deviations. Based upon the statistic for each pair of sample means, H_0 was rejected if the lower-tailed probability for H_0 was less than .05.

Hypotheses 2 and 3 were tested by means of three members of the closely inter-related family of multi-variate statistical techniques: canonical correlation, multiple regression, and bivariate correlation.

Canonical correlation, a statistical technique similar in many respects to both multiple regression and factor analysis, derives a linear combination for two sets of variables in such a way as to maximize the correlation between the two linear combinations. These pairs of linear

combinations are termed canonical variates, and the square of the amount of correlation between each pair of canonical variates is termed the eigenvalue. This value represents the amount of variance in one canonical variate which is accounted for by the other canonical variate. In this study, CT, CS, XT, and XS formed one set of input variables, and OVL, PER, SUP, EQP, TNG, and RET formed the other set. The relationship between these sets of variables is expressed by the formula:

$$\alpha_1^C \text{OVL} + \alpha_2^C \text{PER} + \alpha_3^C \text{SUP} + \alpha_4^C \text{EQP} + \alpha_5^C \text{TNG} + \alpha_6^C \text{RET} \\ = \beta_1^P \text{CS} + \beta_2^P \text{CT} + \beta_3^P \text{XT} + \beta_4^P \text{XS}$$

where:

α_N = weighting for NAVFORSTAT and retention variables
(N=1,2,...)

β_N = weighting for LOQ variables (N=1,2,...)

C_X = criterion variables (X=OVL, PER, ...)

P_X = predictor variables (X=CT, CS...)

The relationship between CT, CS, and, XT, XS was analyzed by forming two sets of input variables as follows:

$$\alpha_1^C \text{XT} + \alpha_2^C \text{XS} = \beta_1^P \text{CT} + \beta_2^P \text{CS}$$

where:

α_N = weighting for XT and XS (N=1,2)

β_N = weighting for CT and CS (N=1,2)

= criterion variable (X=XT, XS)

= predictor variable (X=CT, CS)

Multiple regression analysis derives a linear relationship between a single criterion variable and two or more

predictor variables. Multiple regression provides five values of importance to the researcher. The first value, multiple R, indicates the degree of correlation between the criterion variable and the linear combination of predictor variables. The second value, B, indicates the appropriate coefficient for each of the predictor variables in the linear regression equation. The third value, β , has the same role as B when all the measurements are standardized. Both B and β are proportional to the correlation between the criterion variable and each of the predictor variables, with all other criterion variables partialled out (held constant). The fourth value, C, is the intercept constant in the regression equation for unstandardized measurements. The final value, F, is a ratio which allows the statistical significance of the multiple R, and B or β values to be determined. The following relationships were analyzed by means of multiple regression:

- 1.) $OVL = \beta_1 CT + \beta_2 CS + \beta_3 XT + \beta_4 XS + C$
- 2.) $PER = \beta_1 CT + \beta_2 CS + \beta_3 XT + \beta_4 XS + C$
- 3.) $SUP = \beta_1 CT + \beta_2 CS + \beta_3 XT + \beta_4 XS + C$
- 4.) $EQP = \beta_1 CT + \beta_2 CS + \beta_3 XT + \beta_4 XS + C$
- 5.) $TNG = \beta_1 CT + \beta_2 CS + \beta_3 XT + \beta_4 XS + C$
- 6.) $RET = \beta_1 CT + \beta_2 CS + \beta_3 XT + \beta_4 XS + C$
- 7.) $XT = \beta_1 CT + \beta_2 CS + C$
- 8.) $XS = \beta_1 CT + \beta_2 CS + C$

where:

= weightings for predictor variables (N=1,2...)

= constant.

Finally, bivariate correlation provides a measure of the extent of the linear relationship between a single predictor and a single criterion variable. In this study, a matrix of correlations for all possible combinations of leadership style, unit performance, and retention was computed. These correlations were then individually tested for statistical significance.

IV. DESCRIPTION OF FINDINGS

This chapter describes the results of the statistical analysis of LOQ, NAVFORSTAT, and retention data collected in the study. An LOQ was mailed to both the CO and XO of fifty combatant surface units. In thirty-four of these units, both the CO and XO completed and returned an LOQ. Of these thirty-four units, only twenty of the CO's and XO's had functioned as a dual-leadership team for six months or longer. These leadership-style data were then compared with NAVFORSTAT and retention data for each of the twenty units. An overview of the data for these twenty units is provided in Table 4-1.

A. LEADERSHIP STYLES

As a start, the means for CT, CS, XT, and XS were compared with normative LOQ data (Table 4-2). This comparison showed that the mean for CS (54.9) falls in the 60th percentile of the normative population. The mean for CT (48.6) falls in the 40th percentile, while the mean for XS (50.7) falls in the 40th percentile. Finally, the mean for XT (47.1) falls in the 30th percentile. From this comparison it would appear that both the CO and XO are lower in the task-related dimension than civilian managers. The CO appears to be higher in the socio-emotional dimension than civilian managers, while the XO appears to be lower in this dimension than civilian managers.

TABLE 4-1

DATA OVERVIEW

Unit	CT	CS	XT	XS	OVL	PER	SUP	EQP	TNG	RET
1.	48	51	58	50	30	30	30	28	30	31
2.	39	55	42	49	27	30	30	27	27	40
3.	52	36	52	45	31	26	20	21	20	32
4.	53	52	37	58	20	30	16	23	30	40
5.	43	49	43	36	19	24	17	22	28	40
6.	37	52	53	49	22	28	30	27	30	41
7.	49	61	39	55	27	25	21	21	37	40
8.	47	54	54	54	24	28	40	20	20	45
9.	52	69	41	62	23	25	29	22	21	50
10.	47	56	40	53	26	30	27	26	30	40
11.	51	60	65	50	33	36	38	34	40	45
12.	59	55	46	45	32	40	30	27	40	36
13.	49	66	50	56	24	40	20	30	30	68
14.	44	60	41	58	24	26	33	24	30	52
15.	45	57	45	56	25	36	28	26	33	40
16.	46	50	43	53	16	20	14	22	30	33
17.	51	47	48	43	26	38	28	26	32	28
18.	60	54	48	51	31	34	30	29	32	59
19.	49	56	50	48	22	30	33	20	35	50
20.	50	57	47	42	22	30	21	20	20	31
Mean	48.6	54.9	47.1	50.7	25.2	30.3	26.8	24.8	29.8	42.1
Std Dev.	5.6	7.0	7.0	6.3	4.6	5.5	7.1	3.9	6.0	10.0

TABLE 4-2

LOQ ANALYSIS

Normative Data (N=3008)			
	% tile	Socio-emotional Score (Consideration)	Task-related Score (Structure)
Very high	99	72	68
	98	69	66
	97	68	64
	95	65	64
	90	62	60
High	85	60	58
	80	59	57
	75	58	55
	69	57	54
	60	55 - CS	52
Average	50	53	50
	40	51 -XS	49 - CT
	31	50	47 - XT
	25	48	45
	20	47	44
Low	15	46	42
	10	44	41
	5	42	38
	3	41	36
Very low	2	40	34
	1	38	31

Source: Fleishman, 1974

Although normative data were not available for Naval officers, Fleishman (1969) has summarized LOQ data for a sample of 274 Naval officer candidates. The mean for the socio-emotional dimension (consideration) for these officer candidates was 44.2, while the mean for the task-related dimension (structure) was 55.4. If we compare these means with the means for CT, CS, XT, and XS, in this study, we find an interesting trend in the mean values for these leadership dimensions at different periods in a Naval officer's career. At an early career period (officer candidate), we find the mean for the task-related dimension to be relatively high (75th percentile), while the mean for the socio-emotional dimension is relatively low (10th percentile). At a more senior period (X0), we find that the mean for the task-related dimension has decreased significantly (30th percentile), while the mean for the socio-emotional dimension has increased significantly (40th percentile). Finally, at a still later career period (C0), we find that the mean for the task-related dimension has remained approximately the same (40th percentile), while the mean for the socio-emotional dimension has continued to increase (60th percentile). Based upon these trends, we would predict that a sample of Naval officers at the next level of seniority would reflect an increasing mean for the socio-emotional dimension, and a relatively constant mean for the task-related dimension.

These differences may indicate that the leadership style of Naval officers tends to become more socially oriented, and less task oriented, as they become more senior. If we accept the premise that leadership style is relatively constant and enduring over time, the changes in the mean values for these leadership dimensions may be attributable to changes in the population of officers at each career period, rather than changes in leadership behavior. These changes in the population of officers at different career periods may well be largely attributable to the Navy's promotion and screening system. It appears that this system "filters out" those officers with a high task-related orientation and low socio-emotional orientation, while it promotes those officers with a high socio-emotional orientation and a medium task-related orientation. As a consequence, we find the mean for socio-emotional emphasis increasing over time, as individuals low in this dimension are "filtered out." Conversely, we find the mean for task-related emphasis decreasing as individuals high in this dimension are "filtered out."

One explanation for this finding is that the officer high in the socio-emotional dimension tends to establish closer interpersonal relations with his superiors than the task-directed, socially distant officer. As a result, there is a tendency for the socially oriented officer to be more highly regarded by his superiors than the socially distant officer. It appears logical to assume that the socially

oriented officer is likely to receive better fitness reports and opportunities for advancement because he is more highly regarded by his superiors than the socially-distant officer.

The relationship between CO and XO leadership styles was next analyzed by comparing the values for CS with XS and the values for CT with XT for each unit (Table 4-1). In 8 (40%) of the units, the CO was higher than the XO in both task-related and socio-emotional dimensions. In 6 (30%) of the units, the CO was higher in the socio-emotional dimension, while the XO was higher in the task-related dimension. In 2 (10%) of the units, the XO was higher in the socio-emotional dimension, while the CO was higher in the task-related dimension. In 3 (15%) of the units, both CO and XO were equal in the task-related dimension, with the CO higher in the socio-emotional dimension of 2 of these units (10%), and the XO higher in this dimension in the remaining unit (05%). Finally, both CO and XO were equal in the socio-emotional dimension, with the XO higher in the task-related dimension in 1 (05%) of the units.

Differences in the mean values for CS and XS and CT and XT were tested by means of Student's t-statistic (Table 4-3). This test showed that the mean for CS (54.5) was significantly higher than the mean for XS (50.7), and that the mean for CT (48.6) does not differ significantly from the mean for XT (47.1). These results partially support hypothesis number 1; that is, we may conclude in favor of hypothesis 1.1,

TABLE 4-3

t-TEST RESULTS

<u>Test no.</u>	<u>Variables</u>	<u>Mean</u>	<u>Std Dev</u>	<u>Difference</u>	<u>t-value</u>	<u>df</u>	<u>significance level</u>
1.	CT	48.6	5.6	1.5	.74	19	.47
	XT	47.1	7.0				
2.	CS	54.9	7.0	4.2	3.1	19	.005
	XS	50.7	6.3				

that CS is significantly greater than XS, while we cannot conclude in favor of hypothesis 1.2, that XT is significantly greater than CT.

With respect to the dual leadership theory, it would appear that the CO either performs both the socio-emotional and task-related functions (the "great man" leader), or the CO and XO divide these functions, with the CO generally performing the socio-emotional function, and the XO performing the task-related function.

The results of the canonical, multiple, and bivariate analyses are summarized in Table 4-4 through 4-6. Bivariate correlation (Table 4-6) results show that both XT and XS have a near zero correlation with CT (.06 and .04 respectively), and that XT has a zero correlation with CS. Nevertheless, we find a significant positive correlation between CS and XS (.59). Finally, we find that CT has a near-zero correlation with CS (.02), and although the correlation between XT and XS appears suspiciously far from zero (-.26), this value is not significant for a sample of this size. These latter findings appear to support Fleishman's claim that the LOQ dimensions are independent.

The results of the correlation analysis indicate that there is little relationship between the CO's task orientation and either the XO's task or social orientation. Moreover, there appears to be little relationship between the CO's social and the XO's task orientation. However, when the CO is high in the socio-emotional dimension, the XO is

TABLE 4-4

CANONICAL CORRELATION RESULTS

Analysis	Eigenvalue	Cancorr	Chi-square	D.F.	Significance				
1.	.61	.78	29.3	24	.21				
	Variables	CT	XT	XS	OVL	PER	SUP	EQP	TNG
	Weighting	.48	-.69	-.35	.54	.35	-.77	-.80	.16
	Eigenvalue	Cancorr	Chi-square	D.F.	Significance				RET
2.	.51	.71	18.9	12	.09				-.25
	Variables	CT	CS	OVL	PER	SUP	EQP	TNG	RET
	Weighting	.96	-.29	1.00	.55	-.59	-.82	.12	.13
Analysis	Eigenvalue	Cancorr	Chi-square	D.F.	Significance				
3.	.50	.70	14.4	12	.28				
	Variables	XT	XS	OVL	PER	SUP	EQP	TNG	RET
	Weighting	1.00	.53	.10	-.21	.65	.69	-.27	.11
Analysis	Eigenvalue	Cancorr	Chi-square	D.F.	Significance				
4.	.47	.69	17.1	8	.03				
	Variables	CT	CS	XT	XS	OVL	RET		
	Weighting	.59	.54	.59	.25	.66	.75		
Analysis	Eigenvalue	Cancorr	Chi-square	D.F.	Significance				
5.	.35	.59	7.1	4	.13				
	Variables	CT	CS	XT	XS				
	Weighting	.02	1.00	.00	1.00				

TABLE 4-5

MULTIPLE-REGRESSION RESULTS

Analysis	Multiple R	F	DF	Significance		
1.	.65	2.7	4/15	-		
Variables	OVL	CT	CS	XT	XS	
B weights and C		.36	-.15	.30	.22	-6.4
Beta weights		.44	-.02	.46	.03	
F		4.9	.01	5.0	.02	
Significance		.05	-	.01	-	
Analysis	Multiple R	F	DF	Significance		
2.	.59	2.0	4/15	-		
Variables	PER	CT	CS	XT	XS	
B weights and C		.38	.28	.24	-.20	-4.8
Beta weights		.39	.36	.31	-.23	
F		3.4	2.0	2.0	.77	
Significance		.05	-	-	-	
Analysis	Multiple R	F	DF	Significance		
3.	.63	2.5	4/15	-		
Variables	SUP	CT	CS	XT	XS	
B weights and C		-.67	.27	.61	.16	-21.7
Beta weights		-.05	.27	.60	.14	
F		.07	1.1	8.2	.30	
Significance		-	-	.01	-	
Analysis	Multiple R	F	DF	Significance		
4.						
Variables	EQP	CT	CS	XT	XS	
B weights and C		.39	.15	.28	.22	.41
Beta weights		.06	.26	.51	.4	
F		.07	.97	5.2	.02	
Significance		-	-	.01	-	

Analysis	Multiple R	F	DF	Significance		
5.	.32	.44	4/15	-		
Variables	TNG	CT	CS	XT	XS	
B weights and C		.20	.25	.88	-.15	9.41
Beta weights		.19	.29	.10	-.15	
F		.61	.92	.16	.25	
Significance		-	-	-	-	

Analysis	Multiple R	F	DF	Significance		
6.	.65	2.8	4/15	-		
Variables	RET	CT	CS	XT	XS	
B weights and C		.16	.74	.20	.32	-31.5
Beta weights		.09	.52	.14	.20	
F		.21	4.6	.45	.67	
Significance		-	.01	-	-	

Analysis	Multiple R	F	DF	Significance		
7.	.06	.04	2/17	-		
Variables	XT	CT	CS			
B weights and C		.50	.36	44.4		
Beta weights		.06	.04			
F		.06	.02			
Significance		-	-			

Analysis	Multiple R	F	DF	Significance		
8.	.59	4.53	2/17	.05		
Variables	XS	CT	CS			
B weights and C		.43	.65	22.0		
Beta weights		.00	.59			
F		.00	8.4			
Significance		-	.01			

TABLE 4-6

BIVARIATE CORRELATION RESULTS

	CT	CS	XT	XS	OVL	PER	SUP	EQP	TNG	RET
CT	1.0	.02	.05	.03	.46	.41	-.01	.09	.20	.11
CS	.02	1.0	-.16	.59	-.07	.18	.25	.21	.19	.62
XT	.05	-.16	1.0	-.26	.48	.33	.52	.46	.11	.01
XS	.02	.59	-.26	1.0	-.09	-.09	.14	.06	.00	.48
OVL	.46	-.07	.48	-.09	1.0	.53	.49	.56	.32	.01
PER	.41	.18	.33	-.09	.53	1.0	.32	.65	.46	.22
SUP	-.01	.25	.52	.14	.49	.32	1.0	.32	.16	.22
EQP	.09	.21	.46	.06	.56	.65	.32	1.0	.54	.28
TNG	.20	.19	.11	.00	.32	.46	.16	.54	1.0	.10
RET	.11	.62	.01	.48	.01	.22	.22	.28	.10	1.0

Significance testing:

N=20

Correlation	Significance
.00 - .37	-
.38 - .43	.05
.44 - .55	.025
.56 - .65	.005

also likely to be high in this dimension. Apparently, the XO's degree of task-related emphasis is largely a function of his own leadership style, and the demands of his position, rather than the leadership style of the CO. However, when the CO is high in the socio-emotional dimension, it appears that an environment is provided which encourages the XO to be high in this dimension as well.

B. UNIT PERFORMANCE AND RETENTION

Although no significant (.05) canonical correlations were found when all of the performance and retention variables were analyzed simultaneously, a significant correlation was found between CT, CS, XT, and XS and OVL and RET, when the remaining performance variables (PER, SUP, EQP, and TNG) were omitted from the canonical equation. This correlation indicates that approximately 47% of the variance in unit OVL and RET is accounted for by CT, CS, XT and XS. The relative weightings for these variables indicate that XT (.59) is the most significant predictor of OVL and RET, followed closely by CS (.54), and CT (.52). XS (.25) appears to be the least significant predictor of both OVL and RET. The finding of only one significant canonical correlation may be partially attributable to the fact that PER, SUP, EQP, and TNG account for a relatively small portion of the variance in the canonical equation while degrees of freedom are taken for these variables. As a consequence, the Chi-square test will tend to indicate that the canonical correlation is not significant when all performance variables are analyzed simultaneously.

When each of the performance and retention variables were regressed independently against the LOQ variables (Table 4-5); CT (.44) and XT (.46) were found to be significant predictors of OVL, CT (.39) was found to be a significant predictor of PER, XT (.60) was found to be a significant predictor of SUP, XT (.51) was found to be a significant predictor of EQP, and CS (.52) was found to be a significant predictor of RET. No significant predictors were found for the TNG variable. None of the multiple R's for these regression equations were found to be significant. Again, this finding may be attributable to the fact that only one or two of the predictor variables account for a significant portion of the variance in the dependent variable in each regression equation, so that with degrees of freedom taken for both significant and non-significant predictor variables, the F test will tend to indicate that the multiple R's are not significant.

The bivariate correlation analysis (Table 4-6) showed that CT (.46) and XT (.48) were significant predictors of OVL, CT (.41) was a significant predictor of PER, XT (.52) was a significant predictor of EQP, and that both CS (.62) and XS (.48) were significant predictors of RET. Again, no significant predictors were found for the TNG variable.

Significant correlations between leadership style and unit performance and retention are summarized in Table 4-7. These correlations consistently show that the task-related dimension is a significant predictor of unit performance,

TABLE 4-7

SUMMARY OF SIGNIFICANT RESULTS*

Analysis	Criterion Variables							Predictor Variables
	OVL	PER	SUP	EQP	TNG	RET		
Multiple-	XT(.46)	CT(.39)	XT(.60)	XT(.51)	-	CS(.52)		
Regression	CT(.44)	-	-	-	-	-		
Weights	-	-	-	-	-	-		
Bivariate-	XT(.48)	CT(.41)	XT(.52)	XT(.46)	-	CS(.62)		
Correlation	CT(.46)	-	-	-	-	-		
Coefficients	-	-	-	-	-	-		

* P .05

and that unit performance is relatively independent of the socio-emotional dimension. Conversely, these correlations show that the socio-emotional dimension is an important predictor of unit retention, and that unit retention is relatively independent of the task-related dimension. The task-related emphasis of the CO and XO appears to be of equal importance as a predictor of unit overall readiness. The task-related emphasis of the CO is an important predictor of unit personnel readiness, while the task-related emphasis of the XO is an important predictor of unit supply and equipment readiness. Although the socio-emotional emphasis of both the CO and XO is an important predictor of unit retention, it would appear that the CO is a significantly more important predictor of retention than the XO. Finally, unit training readiness appears to be unrelated to either the task-related or socio-emotional dimension.

These results appear to provide partial support for hypothesis 2, that the task-related dimension will be a significant predictor of unit performance and that the socio-emotional dimension will be a significant predictor of unit retention. Although CT is a significant predictor of OVL and PER, and XT is a significant predictor of OVL, SUP, and EQP, these two leadership dimensions are not significant predictors of all performance indicators as postulated in hypotheses 2.1 and 2.2. On the other hand, we do find that both CS and XS are significant predictors of RET, as postulated in hypotheses 2.3 and 2.4.

Continuing our analysis of the relationship between leadership style and unit performance and retention, we find higher correlations between leadership style and retention than leadership style and unit performance. This finding may indicate that while there are many situational factors which suppress the relationship between leadership and unit performance, there appear to be fewer situational factors which suppress the relationship between leadership and unit retention. This finding may also be partially attributable to the differences in NAVFORSTAT ratings and retention statistics as indicators. To some extent, NAVFORSTAT ratings are subject to bias by the unit commander. If these ratings are biased to reflect a greater degree of unit readiness than has actually been attained, it follows that the correlations between leadership style and unit performance may be reduced significantly. Retention statistics on the other hand, are highly objective and relatively bias-free. As a consequence, we may find higher correlations between unit retention and leadership style.

As significant correlations were found between leadership style and performance and retention variables, it would appear that these indicators are influenced by leadership effectiveness as measured by Fleishman's LOQ. If the NAVFORSTAT ratings are indeed being biased, they would appear to be consistently biased by all units. Of the five NAVFORSTAT readiness ratings selected, only TNG was found to be independent of leadership style. One possible

explanation for this finding is that training readiness is integrally related to qualification for squadron efficiency awards. In order to qualify for these awards, units may consistently report a higher degree of training readiness than has actually been attained. As a result, we may find that these consistently exaggerated training readiness ratings reflect a low correlation with leadership style.

The results of the correlation analysis show that the task-related emphasis of both the CO and XO are significantly related to overall unit readiness. This finding is logical when we consider that unit mission readiness is specified in Navy directives as the primary responsibility of both the CO and XO. The finding that the task-related emphasis of the CO is a significant predictor of unit personnel readiness, while the task-related emphasis of the XO is a significant predictor of supply and equipment readiness, is consistent with the "MR. inside - MR. outside" relationship common among civilian executives. The CO appears to utilize his position power to influence external agencies which will affect his unit's personnel manning level. The XO, on the other hand, appears to direct his effort towards operational and administrative aspects of supply and equipment which are internal to the command.

Based upon these findings, we may conclude in favor of hypothesis 3, that is, the most effective combination of leadership styles with respect to unit performance and retention appears to be when both the CO and XO are high

in both the task-related and socio-emotional dimensions. The next most effective combination of leadership styles appears to be when the CO is high in both dimensions, and the XO is high in the task-related dimension and moderately high in the socio-emotional dimension. The least effective combination appears to be when the CO and XO are low in both dimensions.

V. CONCLUSION

For thousands of years man has attempted to identify the attributes and behaviors which characterize effective leadership. The many definitions and concepts of leadership have created widespread diversity in the approaches to the study of leadership. Over the last three decades, leadership has been studied in relationship to the leaders' physical and psychological traits, in relationship to the leader's behavior, in relationship to the needs of the leader's followers, and in relationship to a wide range of situational factors. A significant part of this research has indicated that leadership behavior may be characterized by two dimensions: task and social orientation. A wide variety of studies have shown that the task dimension has a positive relationship with group productivity, while the social dimension has a positive relationship with subordinate satisfaction and cohesion. Despite this vast wealth of leadership research, we find relatively few studies of leader effectiveness within the Navy. In view of the many leadership problems which face the Navy today, this research would appear to be of considerable importance.

This study attempts to provide empirical data which will show how and to what extent specific styles of leadership may maximize both unit performance and retention. The study focuses upon a sample of twenty comparable destroyers and frigates within the Pacific Fleet. Leadership-style

data were collected from the CO and XO of these units by means of Fleishman's LOQ, a self administering leadership inventory which measures two dimensions of leader behavior: consideration and structure. These leadership-style data were compared with two measures of unit effectiveness: NAVFORSTAT readiness ratings and retention statistics. These data were collected over a six month period (September, 1978 to February, 1979) in which the CO and XO of each unit had functioned as a "dual leadership" team. Three hypotheses were developed regarding these data: (1) that the CO will tend to adopt the socio-emotional function, while the XO will tend to adopt the task-related function, (2) that the task-related dimension of both the CO and XO will have a significant positive relationship with unit performance, and that the socio-emotional dimension of both the CO and XO will have a significant positive relationship with unit retention, and (3) that unit performance and retention will be highest when the CO and XO are high in both the task-related and socio-emotional dimensions.

The results of this study partially support hypotheses one and two, and fully support hypothesis three. These results indicate that the CO either tends to perform both the task-related and socio-emotional functions (the "great man" leader), or the CO and XO divide these functions, with the CO generally performing the socio-emotional function, and the XO performing the task-related function (dual leadership). The results also indicate that the mean value

for the CO's socio-emotional dimension is significantly greater than the mean value for the XO's socio-emotional dimension, while the mean values for the task-related dimension do not differ significantly between the CO and XO. When these means are compared with normative LOQ data, we find that CO's appear to be higher in the socio-emotional dimension, and lower in the task-related dimension than civilian leaders, while XO's appear to be lower in both dimensions than civilian leaders.

When these means were compared with the mean LOQ scores for a sample of Navy officer candidates, an interesting trend appeared to emerge. As Naval officers advance in seniority, the mean for the task-related dimension appears to decrease to a point, and then level off, while the socio-emotional dimension appears to increase steadily. These results may indicate that Naval officers tend to become less task-directed and more socially oriented over time, or that the Navy's promotion system appears to "filter out" the task-oriented, socially distant officer.

Further analysis indicated that the leadership styles of the CO and XO appear to exert the most influence upon unit overall readiness and retention, while unit training readiness appears to be unrelated to the leadership style of either the CO or XO. The CO and XO appear to divide the task-related function in a manner consistent with the "MR. inside - MR. outside" relationship common in the civilian sector. We find that the task-related emphasis of both

the CO and XO is significantly related to overall unit readiness, a finding consistent with their responsibilities as delineated in Navy directives. Moreover, the CO appears to direct his task-related emphasis towards the maintenance of unit personnel readiness ("Mr. outside"), while the XO directs his task-related emphasis towards the maintenance of unit supply and equipment readiness ("Mr. inside"). Finally, we find that the socio-emotional emphasis of the CO, and to a lesser extent the XO, is positively related to unit retention. In view of the recent decision to include unit retention as a measure of effectiveness in commanding officers' fitness reports, this finding is particularly encouraging. These results suggest that the unit performance and retention are likely to be most effective when the CO and XO are high in both the task-related and socio-emotional dimensions.

This study has potential implications for the Navy in several respects. First of all, data relating to the effects of specific styles of leadership upon unit performance and retention may be utilized in leadership training programs such as LMT and LMD. A better understanding of the implications of leadership behavior may significantly improve leadership at all levels within the Navy. Moreover, these data have potential application in prospective commanding and executive officer schools. This training may well provide an opportunity for CO's and XO's to improve their units' performance and retention by adopting specific leadership

behaviors. In the future, an indication of an officer's task-related and socio-emotional orientation could be included in fitness report forms. This information would be extremely useful for selection and screening boards. Moreover, detailers could use this information to determine optimum combinations of prospective commanding and executive officers and to predict the probable outcomes of unit performance and retention given a specific combination of CO and XO leadership styles.

Although the results of this study are promising, the sample is relatively small. Additional research is needed to identify more specifically aspects of leader behavior which will improve unit performance and retention, and to establish causal relationships between leadership style and unit performance and retention. Furthermore, follow-on studies utilizing other measures of leadership style, such as Fiedler's LPC, as well as other measures of unit performance and crew-member satisfaction and cohesion, may reveal other important aspects of leadership effectiveness. Follow-on research is also needed to determine the relationships between leadership style and unit performance and retention within other communities in the Navy. Moreover, it would be of interest to compare and contrast the leadership styles of officers within different communities in the Navy. Finally, additional research regarding leadership within the the soviet military would be of great importance. One might suspect that the division of leadership within the soviet

military between an operational and political leader is in itself "dual leadership;" however, at the present time, there appear to be no empirical data which support this premise. An understanding of the leadership practices of our potential enemies may well prove as important as an understanding of our own leadership.

If the Navy is to remain a viable instrument of national defense, the study of leadership must be a dynamic, ongoing process. In closing, we would do well to bear in mind the words of Admiral Arleigh Burke (1959):

"No matter what the weapons of the future may be, no matter how they are employed in war or international diplomacy, man will still be the most important factor in Naval operations. The need for good leadership, therefore, is the constant factor, and in this lies the officer's greatest opportunity for service to his country and to the cause of freedom throughout the world."

APPENDIX A

FLEISHMAN'S LEADERSHIP OPINION QUESTIONNAIRE

1. Put the welfare of your unit above the welfare of any person in it.
2. Give in to your subordinates in discussion with them.
3. Encourage after-duty work by persons of your unit.
4. Try out your own new ideas in the unit.
5. Back up what persons under you do.
6. Criticize poor work.
7. Ask for more than the persons under you can accomplish.
8. Refuse to compromise a point.
9. Insist that persons under you follow to the letter those standard routines handed down to you.
10. Help persons under you with their personal problems.
11. Be slow to adopt new ideas.
12. Get the approval of persons under you on important matters before going ahead.
13. Resist changes in ways of doing things.
14. Assign persons under you to particular tasks.
15. Speak in a manner not to be questioned.
16. Stress importance of being ahead of other units.
17. Criticize a specific act rather than a particular member of your unit.
18. Let the persons under you do their work the way they think is best.
19. Do personal favors for persons under you.
20. Emphasize meeting of deadlines.
21. Insist that you be informed on decisions made by persons under you.

22. Offer new approaches to problems.
23. Treat all persons under you as your equals.
24. Be willing to make changes.
25. Talk about how much should be done.
26. Wait for persons in your unit to push new ideas.
27. Rule with an iron hand.
28. Reject suggestions for changes.
29. Change the duties of persons under you without first talking it over with them.
30. Decide in detail what shall be done and how it shall be done by the persons under you.
31. See to it that persons under you are working up to capacity.
32. Stand up for persons under you, even though it makes you unpopular with others.
33. Put suggestions made by persons in the unit into operation.
34. Refuse to explain your actions.
35. Ask for sacrifices from persons under you for the good of your entire unit.
36. Act without consulting persons under you.
37. "Needle" persons under you for greater effort.
38. Insist that everything be done your way.
39. Encourage slow-working persons in your unit to work harder.
40. Meet with the persons in your unit at certain regularly scheduled times.

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