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JOB TYPE AS AN INTERVENING VARIABLE IN THE
PREDICTION OF MANAGERIAL SUCCESS, USING
MEASURES OF COGNITIVE ABILITIES, PERSONALITY,
AND SELF-PERCEIVED LEADERSHIP STYLE

Research conducted in the Department
of Business and Industrial Studies,
University of Warwick.

by

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Thesis submitted to the University
of Warwick in fulfillment of the
requirements of the degree of
Doctor of Philosophy

July 1981

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ACKNOWLEDGEMENTS

It seems trite to say that this thesis could not have been done without the help of a number of people, but that is very much the case. The research was carried on on two sides of the Atlantic, and help was forthcoming everywhere I worked on it.

My most sincere and heartfelt thanks must go to my advisor, my conscience, my guide, and my friend, Tom Watson. If there is an ideal style for a thesis supervisor, then Tom exemplifies it, at least for me. He was a steady influence, and a calm, rational and sober force that was invaluable in helping me control my totally opposite traits. I doubt that I could have completed this with anyone else.

In Britain I got a great deal of help from David West.

In Canada, Joe Kelly at Concordia was, as always, a source of tremendous support and a reservoir of incredible knowledge. Robert Rosenfeld spent a great deal of time helping me search references and preparing my bibliography and also calmed me with his implacable confidence and competence.

The typing was done professionally by Sandy Pritchard, a veteran of a number of books and large projects, who was

able to advise me on format and pick out many of the unintelligible phrases that kept appearing in the text, and by her equally expert daughter, Sherri Rufh, who toiled through heat, sickness and health, and managed to care for her new-born baby at the same time.

I have never experienced stress at such a high level before, and my wife Lynn is certainly responsible for getting me through this alive, if not well. She, like Tom Watson has always expressed confidence in me, which leads me to believe they are both misguided.

A special debt of thanks is owed to Gunther Brink, the Chairman of the Management Department at Concordia University, in Montreal, who invited me there as a Visiting Professor to write my thesis and utilize the immense resources of the Montreal universities.

Thank you all very much.

And finally, I should like to dedicate this thesis to the memory of John Charnock M.Phil, Phd., valued colleague and friend who was a conscience to me, and a constant goad, pressing me on to completion. I, like anyone who knew him and worked with him, will miss him a lot.

ABSTRACT

This research is a predictive study of managerial success by specific job type in a single British company. Seventy-four managers, at the same level, in two specific jobs differentiated by degree of task structure, completed a battery of tests of cognitive abilities, personality, and self-perceived leadership style. Three years later their status was checked to determine if they had been promoted or not. Differences were examined in Successful managers between job types, in Unsuccessful managers between job types, and between Successful and Unsuccessful managers within job type, and for all managers as a whole regardless of job differences.

The basic hypothesis of the research, that a situational approach to the prediction of managerial success, differentiating managers by job type, would yield better results than predictions of managerial success without regard for job differences was supported. Significant differences in cognitive abilities, personality, and self-perceived leadership style were found between Successful managers in the two job functions, and classification of Successful and Unsuccessfuls by discriminant analysis was more accurate for managers within specific job types than for the total sample of managers without regard for job differences.

INTRODUCTION

THE FOCUS OF THE RESEARCH: AN OVERVIEW

This research takes a situational approach to the actuarial prediction of managerial success. It is based on arguments put forward in the literature (Ghiselli, 1963, 1966a, 1966b; Dunnette, 1967, 1971; Korman, 1968; Campbell, et.al., 1970; Braun & Knoche, 1978; Batlis & Green, 1979) that (a) tests of cognitive abilities, personality and leadership style have some predictive ability in the determination of managerial effectiveness and success, (b) that their demonstrated lack of sufficient strength to make consistently firm predictions may be attributed, in part, to global applications which fail to take into account situational differences due to function, level, size, company, etc., and (c) that there have been very few truly predictive, longitudinal studies where the assessment information was gathered prior to obtaining effectiveness and success ratings.

Surveys of the literature indicate linkages between:

- (1) managerial performance and cognitive abilities (Mann, 1959; Korman, 1968; Ghiselli, 1966b, 1973; Dunnette 1972, 1976),
- (2) managerial performance and personality variables (Stogdill, 1948, 1974; Mann, 1959; Guion & Gottier, 1965; Korman, 1968; Borman, 1974; Kerr & Schreisheim, 1974),
- (3) managerial performance and leadership style (Coch & French, 1948; Delbecq, 1965; Stogdill, 1974; Graen et.al., 1973; Wexley, Singh & Yukl, 1973; Hunt, et.al., 1975).

While the predictive ability of standardized tests of cognitive ability, personality, and leadership style, taken by themselves, is low (Guion & Gottier, 1965; Hedlund, 1965; Korman, 1966; Campbell, et.al., 1970), there is evidence which indicates that combination of variables, the use of composite scoring keys, and discriminant function analysis can increase the power of predictions made by actuarial methods (Bentz, 1962, 1967; Laurent, 1961, 1962). As Campbell, et.al. (1970) comment, on the basis of their survey of actuarial studies of managerial effectiveness:

"Taken together, these studies provide good evidence that a

fairly sizable portion (30 to 50 per cent) of the variance in general managerial effectiveness can be expressed in terms of personal qualities measured by self-response tests and inventories and combined by predetermined rules or statistical equations."

The research results of more than thirty studies or groups of studies of managerial success have been summarized by Dunnette (1967, 1971) and Campbell, et. al., (1970) and the findings vary considerably. The most successful attempts to predict managerial success have been those at Standard Oil of New Jersey (Laurent, 1961, 1962) and Sears Roebuck (Bentz, 1962, 1967). Both of these studies focussed on global characteristics of successful managers. Illustrative correlations obtained between predictor instruments and managerial groups in both of these studies are summarized in Tables 0-1 and 0-2. The Standard Oil figures are clearly the better of the two, but it should be noted that the two highest correlates are based on specially developed scoring keys, making comparison with standardized instruments difficult.

While Bentz argues for the existence of a cluster of psychological characteristics contributing to "a general executive competence that transcends the

	Sample A (N = 222)		Sample B (N = 221)	
	Overall success	Ranking	Overall success	Ranking
Special keys based on item analyses of Guilford-Zimmerman survey	.31	.24	.32	.22
Self Performance Report	.24	.07	.23	.04
Survey of management attitudes	.25	.08	.14	.09
Interview (career information)	.21	.21	.19	.06
Interview (human relations rating)	.19	.32	.19	.20
Management Judgment Test	.51	.16	.47	.17
Biographical survey keys	.63	.44	.50	.33

Table 0-1. Correlations between special scoring keys and stanine scores on the success and ranking for two groups of SONJ managers. (Source: Campbell, et.al. (1970), p.169)

	Median Biserial Correlation
ACE:	
Problem solving score	.14
Linguistic score	.21
Total score	.21
Guilford-Martin:	
General activity	.19
Masculinity	.21
Self-confidence	.25
Objectivity	.17
Tolerance	.20
Allport-Vernon:	
Economic	.15
Political	.28
Kuder:	
Persuasive	.21
Musical	.16

Table 0-2. Median biserial correlations obtained for 12 test variables shown to be consistently statistically significant for seven high success or high potential managerial groups in Sears, Roebuck & Co. (Source: Campbell, et.al. (1970), p.186)

boundaries of specialized or non-specialized assignments", the concurrent correlations shown for the Sears Roebuck studies hardly support the contention. The major drawback of all the studies surveyed, with the exception of that by Flanagan and Krug (1964) is that they make no attempt to differentiate between the cognitive abilities, personality characteristics, and leadership styles of successful managers in different types of jobs. While the direction of the literature on leadership style has swung strongly towards a contingency approach, the field of predictive studies has remained mired in an unfruitful search for general characteristics of managerial success. This research attempts to take a step towards the inclusion of situational variables in the analysis and prediction of success.

Support for a situational approach to the prediction of managerial success by taking into account differences in managerial jobs is provided by Campbell, et.al., (1970) and Dunnette (1967), and by the data from the studies completed by Flanagan and Krug (1964) and Braun and Knoche (1978).

A Brief Description of the Research

This is a predictive, actuarial study of managerial success, situationally based on two separate job functions in a single company. Seventy-four

middle managers in two different types of jobs (operations managers and service managers) were given a battery of tests measuring cognitive abilities, personality characteristics, and self-perceived leadership style. These data were kept confidential for a three year period, after which the status of each manager was checked to see if he or she had been promoted or not. Those individuals who had been promoted within the time period were deemed "successful", and those who had not been promoted were classed as "unsuccessful". The original test data were then examined to determine any differences between (a) successful versus unsuccessful managers without regard to job function, (b) successful versus unsuccessful managers within job function (i.e. differences between successful service managers and unsuccessful service managers, and between successful operations managers and unsuccessful operations managers), (c) successful managers between functions (i.e., differences between successful service managers and successful operations managers), and finally (d) unsuccessful managers between functions. These relationships are represented diagrammatically in Figure 0-1.

		<u>JOB FUNCTION</u>	
		Service Managers (N = 51) (Structured)	Operations Managers (N = 23) (Unstructured)
MANAGERIAL SUCCESS	Successful (N = 16)	(A) (n = 10)	(C) (n = 6)
	Unsuccessful (N = 58)	(B) (n = 41)	(D) (n = 17)

Figure 0-1. The total sample of managers (N = 74) broken down by Job Function (Service Managers and Operations Managers), and by Managerial Success (promoted or not promoted three years after being tested.)

Individual results have remained confidential. a brief summary report of the findings has been presented to the company but no data concerning any specific individual or group has been divulged. Therefore there has been little or no contamination of the criterion measure; no individual's promotion, or lack of same, has been influenced by knowledge of their status on the predictor variables.

A number of tests of difference have been applied to the subgroups within the sample, and discriminant function analysis has been utilized to identify the major differentiating variables among the whole set of predictor variables.

General Hypotheses

The first two hypotheses are that there is a significant difference in cognitive abilities, personality characteristics, and self-perceived leadership style

- (1) between successful and unsuccessful managers within function (i.e. between managers in quadrants (A) and (B), and between managers in quadrants (C) and (D) in Figure 0-1).
- (2) between successful managers in one function and successful managers in the other function (i.e. between

managers in quadrants (A) and (C) in Figure 0-1).

The third hypothesis is that,

- (3) there is no significant difference between unsuccessful managers in one function and unsuccessful managers in the other function (i.e. between managers in quadrants (B) and (D) in Figure 0-1).

And the final hypothesis, testing for increased power of predictions based on job function rather than global predictions, is that,

- (4) predictions of success within functional subgroups will be higher than the overall level of prediction of success for the sample as a whole.

Measurement of the Predictor, Moderator and Criterion Variables

The Predictor Variables. The sixteen predictor variable scores include:

- (1) Cognitive Ability

- (a) AH5 Group Test of High-Grade Intelligence
 - verbal numeric score
 - diagrammatic score
 - sum

(b) Watson Glaser Critical Thinking
Appraisal

(2) Self-perceived Leadership Style

Leadership Opinion Questionnaire (LOQ)

- Consideration score
- Initiating Structure score

(3) Personality Characteristics

Guilford-Zimmerman Temperament Survey

- ten factor scores:
 - G - General Activity
 - R - Restraint
 - A - Ascendance
 - S - Sociability
 - E - Emotional Stability
 - O - Objectivity
 - F - Friendliness
 - T - Thoughtfulness
 - P - Personal Relations
 - M - Masculinity

The Moderator Variable. The moderator variable, job function, is based on the degree of task structure inherent in the job as measured by Shaw's (1963) scale, used by Fiedler (1967). It is a four-item scale measuring the degree of (a) goal clarity, (b) goal path multiplicity, (c) decision verifiability, and (d) solution specificity inherent in a job. A low score

indicates a structured job. On the basis of the Shaw scale, the Service Manager's job is relatively structured (10.3) and the Operations Manager's job is relatively unstructured (13.6).

The Criterion Variable. The criterion variable in this study is promotion. Success is measured purely by whether an individual was promoted or not over the three year period. This is consonant with the goal of the organization studied, to determine those individuals likely to be promoted.

There is a great deal of debate in the literature about the choice of appropriate criterion measures. Weitz (1961) has discussed the problem of selecting criteria, as have a series of authors contributing to the Annual Review of Psychology (Wallace & Weitz, 1955; Katzell, 1957; Taylor & Nevis, 1961; Biesheuvel, 1965; Guion, 1967; Owens & Jewell, 1969; Bray & Moses, 1972). Smith (1976) defines a criterion as "a dependent or predicted measure for judging the effectiveness of persons, organizations, treatments, or predictors of behavior, results, and organizational effectiveness." She goes on to say that, "The first requirement of a criterion is that it be relevant to some important goal of the individual, the organization, or society".

It is often difficult to infer real goals from stated goals. In this case, the organization's goal

was to predict promotability. In discussions with the initiators of the study, the term "successful manager" was often used, and the argument was put forward that the ultimate measure of success in the organization was whether an individual got promoted. An underlying goal was certainly to identify "high flyers" -- those individuals on a fast promotional track. Whatever the full reasons, it was an organizational decision to focus purely on promotability. As a measure of success, this is a limited view, and it will be the subject of further discussion at the conclusion of the research. It is certainly a far less sophisticated measure than that used by Standard Oil (Laurent, 1961).

Summary Comments on the Design

Pervin (1970) makes the point that the assessment process has seven distinct aspects, and that variations in any of these may introduce inconsistencies in the resultant data. He defines these seven aspects of the process as:

- (1) the situation: the physical characteristics of the setting in which the assessment takes place,
- (2) the stimulus: the specific task required of the subject(s) and the perceived rationale for performing it, etc.,

- (3) the responses: the issue of reliability of instruments or procedures,
- (4) the scoring: problems of inter-scorer reliability,
- (5) interpretation of the data,
- (6) instructions given to the subject(s): consistency of the protocol,
- (7) the subjects themselves: homogeneity of the group, applicability of measures, etc.

The research design was considered with all of these factors in mind, and care was taken to ensure that as many sources of contamination as possible were controlled. The "situation" was controlled by having identical layouts in each of the testing centres, while instructions, rationale for the testing, and the administrative protocol were kept the same for all subjects, and scoring was done by trained psychologists within the organization. As to the subjects, all were of similar rank, in one of two identical jobs, with minimum service of five years with the organization, all males, and all volunteers. The measures given them have a long record of industrial use (commented on in more detail below), and if there were difficulties of interpretation of certain items, these were not evidenced in any noticeable form.

CHAPTER ONE

THE PREDICTION OF MANAGERIAL SUCCESS:
A SUMMARY OF THE LITERATURE

In spite of the great interest that behavioural science researchers and managers have shown in the prediction of managerial success, there is no clear, detailed account of the phenomena which form the basis for effective management. There have been a number of attempts at predicting managerial success, some of which have been more fruitful than others. However, there is active debate about both the causative factors, and about the concept of effectiveness itself. Neither the independent variables nor the dependent variables are clear (Campbell et.al., 1970; Smith, 1976). There is even some argument discussed in Chapter Two, that the question of causality has been misconceived and that it may in fact be the reverse of what has generally been assumed; such variables as personality and leadership style may be caused by, rather than be the cause of, managerial success (Korman, 1966).

The fields of research in leadership, personality and cognitive ability have all touched on the

issue of predicting performance, as discussed in Chapters Two and Three. However, these have not necessarily been their main thrusts, and often the applications of theory are less attractive to researchers than their development. It consequently appears reasonable to bring together the appropriate findings in each of these areas, and to focus them on the problem of predicting managerial performance. If, as Drucker (1980) maintains,

"Productivity of the human resource, and especially of knowledge workers, requires that people are assigned where the potential for results are, and not where their skill and knowledge cannot produce results no matter how well they work."

then a summary of what we know about managerial performance and an attempt to fuse that knowledge into a workable model that can be applied to the problem of allowing highly skilled individuals to best utilize their talents in an organizational context seems worthwhile.

This chapter reviews the literature concerned with the links between managerial performance and measures of cognitive abilities, personality, and leadership style, and then examines the studies done to date that have utilized some of this data in attempts to predict managerial effectiveness or success.

Cognitive Abilities and Performance

Carroll and Maxwell (1979) raise the issue of whether we should speak of cognitive ability, or cognitive abilities. The point they make is that there is some continuing debate over whether human cognitive capacities can be summarized by a single global concept of intelligence, or whether they are more fruitfully conceived as being multidimensional. The weight of current thinking and research favours a multidimensional view, but Thorndike (1975), commenting on the seventy-year life of the Binet intelligence test, points out that as much as 80% of the test variance can be explained by the first principal factor, and that IQ scores tend to be stable overall, whereas patterns of abilities may be unstable. In spite of this comment, however, there is data supporting the argument that a multifactorial model is more descriptive of the range of cognitive abilities. There are a number of tests which focus on general intelligence (the "g" factor) and others which are concerned with such things as immediate memory, substitution, arithmetic, spatial judgment, etc.

Opinions on the usefulness of intelligence measures as predictors of managerial success differ widely. Ghiselli (1953) reports findings that indicate the higher the level of management being examined,

the higher the correlation between intelligence and effectiveness. On the other hand, Korman (1968) argues that intelligence is a reasonable predictor of first-line supervisory effectiveness, but not of performance at higher managerial levels.

Stogdill (1974) points out that,

"... one of the most significant findings concerning the relationship of intelligence to leadership is that extreme discrepancies between the intelligence of potential leaders and that of their followers militate against the exercise of leadership. ... One of the difficulties in this connection seems to be concerned with communication."

The wider the difference in intelligence between leader and followers, the less likelihood of success for the leader. Ghiselli's (1963) findings support this argument. He states that, "the relationship between intelligence and managerial success is curvilinear with those individuals earning both low and very high scores being less likely to achieve success in management positions than those with scores at intermediate positions".

While the findings for intelligence as a characteristic of effective leaders are mixed, Stogdill (1974) found twenty-five studies that asserted a positive correlation. He also found uniformly positive studies supporting the hypothesis that superior judgment, decisiveness, knowledge, and fluency of speech are

characteristic of leadership effectiveness. Dunnette (1967) summarizes his findings after a review of eighteen predictive studies of managerial success by stating, among other things, "Intelligence seems uniformly to be important wherever it has been studied".

Reviews of the literature linking cognitive abilities to managerial performance have been made by Mann (1959), Korman (1968), Ghiselli (1966a, 1973) and by Dunnette (1972).

The Mann (1959) review included a number of non-managerial situations because the focus of the research surveyed was the relationship of personality and intelligence of the individual and his performance in a small group setting. Many of these studies were based on student groups, sports teams, etc. However, of the twenty-eight studies which examined the relationship between intelligence and leadership status, 88% showed a positive relationship. Mann found the correlation between intelligence and leadership to be significant at the .01 level, but the correlations themselves had a median r of about .25, and none exceeded .50. The data indicated that verbal intelligence was a better predictor of leadership than such non-verbal factors as numerical ability or memory. Mann concluded that,

"There would seem to be little doubt that higher intelligence

is associated with the attainment of leadership in small groups." (Mann, 1959)

Korman's (1968) review had the stated purpose to

"... review and critically evaluate the research literature pertaining to the usefulness of various procedures in the prediction of leadership behaviour in formal organizations in a selection context".

All the studies included were clearly managerial in nature. However, they ranged from first-line supervisory levels to top level management. He focused on the absolute level of correlations rather than statistical significance, on the grounds that there may not be a great deal of similarity between "statistical" significance and "practical" significance. He cited the ~~Dunnette~~ and Kirchner (1962) argument on this point, that in many cases, directionality may be as important as being able to control for type I error.

Korman's review summarized the results from nineteen studies of such groups as naval officers, manufacturing managers, insurance managers, civil service managers, supervisors, Marine corps officers, and MBA's, all of which attempted to predict effective leadership by the application of various tests of cognitive abilities. His conclusion concerning the use of verbal ability as a measure differed from that of Mann (1959). He found it useful as a predictor in

some cases, but not all, and argued that the underlying reason might be found in the fact that the types of individuals who are candidates for managerial positions have already been screened on this measure by nature of their training and experience. He concluded that,

"These results, we believe, do not mean that verbal and other abilities are not important in being a manager. Rather, what it does suggest is that the typical managerial applicant population is already highly pre-selected on abilities and is relatively homogeneous on these variables." (Korman, 1968).

Ghiselli (1973) reviewed the validity of aptitude tests in personnel selection, looking at 20 types of tests and 21 types of jobs. Results were summarized by the averages of the validity coefficients reported for each type of test for each type of job. Tests of intellectual abilities included those of intelligence, immediate memory, substitution, and arithmetic. Results for managerial occupations showed validity coefficients from .23 to .29. However, Ghiselli argued that these coefficients must be considered to be understatement of the predictive power of the tests involved because (a) the criteria used tended to be global in nature, covering all aspects of job performance, while a single test, measuring a restricted range of traits cannot possibly be highly related to

the wide spectrum of traits covered by the criterion measure, and (b) because measures of human performance invariably have some degree of unreliability, with reliabilities characteristically ranging from .60 to .80, and therefore there is a limit to the validity of the tests used to predict them.

Dunnette (1972) reviewed all the studies available on non-supervisory jobs related to the petroleum industry. His findings were similar to those of Ghiselli (1973), although the median validities were generally higher. Dunnette also concluded that his figures represented understatements of the true level of validities that would be found in a single study using specific performance criteria rather than a global criterion. An abstract of his results are summarized in Table 1-1 below.

While Carroll (Carroll & Maxwell, 1979) laments the fact that,

" ... by 1979 a number of thoroughly respectable, scientifically based batteries of multi-factorial ability tests ... had not been devised",

Dunnette (1976) calls for a situational perspective, matching tests of specific cognitive ability to individuals in specific types of jobs. He maintains that,

Aptitude Area	Operating and Processing	Maintenance	Clerical	Quality Control
General Intelligence	.32(80)	.20(111)	.17(14)	.24(8)
Numerical	.19(36)	.35(86)	.12(31)	.14(10)
Verbal	---	.29(16)	.22(8)	.16(4)

Table 1-1. Median validity coefficients for various aptitude areas for performance in four occupational areas relevant to petroleum refining.
(Source: Dunnette, 1972)

" ... several methods exist for justifying both rationally and empirically the usefulness of measures of human attributes in describing or predicting how effectively different persons may be expected to carry out various jobs and work functions."

Conclusion. The results summarized in these surveys show that the validities of measures of cognitive abilities as predictors of managerial performance vary from one occupational area to another. In other words, different types of cognitive abilities are related to performance in different types of jobs.

Personality and Performance

While there is considerable debate in the field as to what constitutes personality, and even whether there is such a thing as personality (Helson & Mitchell, 1978), there is a commonly held view of personality as an abstraction that connotes individuality, relatively stable characteristics, and adaptability. Chapter Three discusses the definitional difficulties associated with the concept of personality, and looks at how it can be measured. Studies of the relationship of personality variables to managerial and organizational performance tend to perceive personality differently, but there is some research that indicates

that there is a degree of overlap in the variables measured by different tests (Borgatta, 1962; Cattell & Gibbons, 1968), although it would be fallacious to assert a wide generality of structure for most of the well used personality inventories.

Mann's (1959) review represents an early baseline for the research on the relationships between personality and an individual's performance or status. It covered the available literature from 1900 to 1957, and found that the studies reviewed used over 500 different measures of personality, leading Mann to comment that, "the field of personality assessment is test rich and integration poor."

On the basis of a frequency analysis, and building on the analyses by French (1953), Cattell (1957), and Eysenck (1953), Mann identified seven personality variables which he used as the focus of his review. The variables were: (1) Intelligence, (2) Adjustment, (3) Extroversion-Introversion, (4) Dominance, (5) Masculinity-Femininity, (6) Conservatism and (7) Interpersonal sensitivity. Each of these variables was examined for its relationship with a variety of status and behavioural variables. The relationship with leadership is summarized in Table 1-2. The positive relationships of intelligence, adjustment and extroversion are highly significant. Dominance, masculinity,

Personality Factors	No. of Studies	No. of Results	Positive				Negative				Positive	% Sig. & in Dir. of Trends (k)
			Sig. (a)	N.S. (b)	Unt. (c)	Sig. (d)	Sig. (e)	N.S. (f)	Unt. (g)	Sig. (h)		
Adjustment	22	164	50	55	14	2	28	0	15	80 (149)	96 (52)	33 (150)
Extroversion	22	119	37	38	6	6	23	3	6	72 (113)	85 (43)	33 (113)
Dominance	12	39	15	9	3	6	4	0	2	73 (37)	71 (21)	42 (36)
Masculinity	9	70	11	37	0	1	19	0	2	71 (68)	92 (12)	16 (68)

Table 1-2. The relationship between personality factors and leadership. (Source: Mann, 1959)

and interpersonal sensitivity are also positively related to leadership.

As mentioned in the earlier comments on Mann's findings concerning intelligence and performance, many of the studies are based on student groups of one kind or another, so that while the directionality of the relationships is interesting, they cannot be seen as strong evidence of relationships between personality variables and managerial performance.

Guion and Gottier (1965) summarized the literature on the validity of personality measures in personnel selection covered by the Journal of Applied Psychology and Personnel Psychology over a twelve-year period. Their conclusion, based on examining studies of some 105 groups in different jobs, and using 15 of the most well known personality tests, was that personality measures had not been demonstrated to be useful as selection instruments. On analysis of the data, their most positive comment about personality testing was that, "personality measures have had predictive validity more often than can be accounted for by chance", but that "no case has been established for any generalized predictive validity of such instruments".

Korman (1968) collected the results of eleven studies which attempted to predict managerial behaviour by using objective personality inventories such as the Bernreuter Personality Inventory, the Guilford-Zimmerman Temperament Survey, the Edwards Personal Preference Schedule, etc. The results are summarized in Table 1-3 in order to show the variety of test instruments, and criterion measures. The results are disappointing. But what is aptly demonstrated by this collection of studies is that there is an almost random attempt to correlate one range of variables with another range of variables. There is no sense of design and underlying theory to the studies summarized. And there is no attempt to identify situational variables which might modify the relationships.

Stogdill (1974) examined 163 studies of leader characteristics in an attempt to discover traits that were correlated with some measure of leadership effectiveness. This review built on his classic 1948 review, and while he identified several new traits in the 1970 study -- adjustment, aggressiveness, independence, objectivity, resourcefulness, tolerance of stress -- there were a number of characteristics which showed positive relationships with leadership effectiveness in both the 1948 and 1970 reviews. These were alertness,

Investigators	Description of Sample & Study	N	Predictors	Criterion	Results
Comrey & High (1955)	Production Supervisors	214 to 227	Six Kuder Preference Record-Vocational Scales (KVPR)	Objective Performance Data	All r's insignificant with the exception of one which was opposite to the logical expectation
Mackinney & Wolins (1960)	Supervisors-3 overlapping samples	I. 66 II. 66 III. 45	a) Guilford-Zimmerman b) Strong Vocational interest Blank (SBIB)	I. Level, tenure and rankings II. Level, tenure and rankings III. Suggestion plan activity by supervisors and subordinates	Inconsistent random patterns of significant r's
Krauss (1964)	Supervisors-4 samples	23 to 73	KVPR	Level changes	Computational scale predicted significantly in 2 of the 4 samples; no other scale predicted.
Knauft (1949)	Bakery Shop Managers	33	Jurgensen Classification Inventory (empirical key)	Objective criterion & rating composite	r = .39*

Comments: Jurgensen Inventory was later withdrawn from market.

Investigators	Description of Sample & Study	N	Predictors	Criterion	Results
Williams & Harrell (1964)	Stanford MBA's- 2 samples- 1) self-employed and family business and 2) employed by large organization	I. 196 II. 116		I. Salary II. Administrative Level	I. Only M-F Scale was significant (r = +.19)*
Comments: Probably some restriction on prediction instruments.					
Robbins & King (1961)	Sales Managers 4 samples	100 to 538	a) KVPR b) Bernreuter Personality Inventory (BPI)	a) Position level changes b) Termination	a) Kuder predicted termination criteria significantly, but highest est r = .28. b) Bernreuter showed similar results against termination criteria with the highest r = .26. c) Position level changes were not predicted by either criterion.
Grant (1956)	Utility Co. Managers-4 samples	40 to 79	Edwards Personal Preference Schedule (EPPS) Guilford-Martin Inventory of factors (GAMIN)	Position level changes	No consistent pattern appeared across the 4 samples for either instrument

Investigators	Description of Sample & Study	N	Predictors	Criterion	Results
Phelan (1962)	Middle-level Managers	94	Allport Ascendance-Submission Test	Performance ratings	No significant relationship appeared.
Comments: Sample grouped from 18 separate companies.					
Dicken & Black(1965)	Manufacturing Managers Insurance Managers	I. 31 II. 26	SVIB MMPI SVIB MMPI	Objective & Rating Criterion Objective & Rating Criterion	Some indication that physical scientists interests predicted negatively, but the relationships were not strong. Some indication of business interest predicting negatively
Comments: No replication across samples.					
Laurent (1962)	Managers-2 samples	Over 200 in each sample	Guilford-Zimmerman Temperament Survey	Ratings	Highest r was +.23, with 5 of the other 19r's being .10 or greater.
Comments: Experimental keys only raised r to .24.					

Investigators	Description of Sample & Study	N	Predictors	Criterion	Results
La Gaipa (1960)	Naval Officers- 2 samples	Shore Sample, 229 Fleet Sample, 264	a) Cooperation b) Risk Scale	Test a) Ratings b) Critical Incidence Reports	Highest r was +.30, with no other r above +.12.

* Significant at .05 level

** Significant at .01 level

Table 1-3. Summary of Studies - Psychometric Prediction: Objective Personality and Interest Inventories. (Source: Korman 1968)

originality, personal integrity, and self-confidence.

While the list of characteristics appears, at first glance, to be impressive, further examination shows that the individual, or single relationships are weak. It appears that personality traits are only descriptive of leadership effectiveness when they are able to interact to form some type of successful profile. This supports the conclusions of other researchers that one-to-one relationships are not of much use in the prediction of success.

More recently, research concerning personality and performance has tended to look at more specific behaviours. For instance, Porter and Steers (1973) have focussed on personality characteristics of individuals who withdraw from organizations. They hypothesise that employees with high levels of emotional instability are more likely to withdraw from organizations than individuals with more moderate levels of these characteristics. Bernardin (1977) showed that turnover and absenteeism could be explained by scores on conscientiousness and anxiety, using Cattell's 16 PF. Rhode, Sorensen, and Lawler (1976) have shown that individuals with a high achievement need stay on the job longer, Greenberg (1977) has shown that they perform better on their jobs and respond to criticism more positively, and Hall (1976) has shown that high

achievement-oriented managers exhibit such traits as candor, openness, receptivity, the use of participation, and concern for people.

For all this continuing focus on personality main effects, there is still strong evidence that traits explain little of the variance in behaviour when compared to situational variables. Sarason, Smith, and Diener (1975) have reviewed studies which compare the effects of personality traits and situational variables as they affect behaviour and found the situation dominant in almost all cases.

The conclusion that research involving personality and its relationship to performance must include some consideration of situational variables is inescapable. ~~Trait theory, per se, is dead, but traits~~ as they are moderated by the situation hold promise for predicting managerial behaviour.

Leadership Style and Performance

The literature on leadership is enormous. Stogdill's (1974) handbook contained over 3,000 references. The Carbondale Symposia have resulted in five books, and both Mitchell (1979) and House and Baetz (1979) report continued high levels of interest and activity in research in leadership. The mood of the field varies from one of gloom to one of optimism (Hunt & Larson, 1977, 1979), but it continues to

reflect interest from both academics and managers.

The evidence for a link between leadership style and managerial performance is clearly made in the literature. There is certainly some debate over the nature of this link, with some researchers denying that leader style affects performance (Lowin, Hrapchak, & Kavanagh, 1969), and others arguing that leadership style is caused by subordinate performance (Herold, 1977), but the weight of studies argue for a causal relationship between leadership style and subordinate performance.

Leadership style has been shown to affect a number of performance indicators. Dansereau, Graen, and Haga (1975), and Graen and Ginsburg (1977) have demonstrated its effect on turnover. Delbecq (1965), Shaw and Blum (1966), Campion (1968) and Wexley, Singh and Yukl (1973) have linked leadership style to productivity. Maier (1970) has argued for its relationship to the quality and acceptance of decisions. Coch and French (1948) in a classic study, and Day and Hamblin (1964) in a more recent one have illustrated the effects of leadership style on acceptance of and adaptability to change. Graen, et. al. (1973) have pointed out the effects on motivation. Meyer (1975) has discussed the relationships of style and organizational structure, and Lieberman and O'Conner (1972)

have put forward evidence that leadership style affects profits.

There can be little argument concerning a relationship between leadership style and performance. The question for debate concerns the nature of that relationship.

Osborn and Hunt (1975) and Hunt and Osborn (1978) have adopted what is termed an interactionist approach to the study of the causes of leadership behaviour. They argue that leaders are affected by, and adapt their behaviour to, the environment. Empirical support for this hypothesis is provided by Hunt, et. al. (1975) and Salancik, et. al., (1976). This process has been taken a step farther by Graen and Cashman (1975), Graen (1976), Graen, et. al. (1977), and Hollander (1978) who argue that a manager and subordinate agree over time how to interact with one another. Leadership is therefore seen as both a process of exchange, and a process of development and change. Graen, et. al. (1977) have shown that this process takes place in situations where there are (a) high latitudes of acceptance, (b) mutual support, (c) involvement, and (d) positive feelings about the leader.

We can conclude from all this research that (a) leadership affects performance under some conditions

and not under others; it is clearly "situational", and (b) the causal relationship between leadership style and performance is two-way.

The Prediction of Managerial Success

The literature on the prediction of managerial effectiveness and success is split into two groups, one of which is concerned with "actuarial" means, and one of which focusses on "clinical" means. The differences in approach are discussed further in Chapter Three, but essentially a clinical approach implies the assessment center process, while an actuarial approach involves the use of psychometric testing. The following brief review of the research in predicting managerial success covers studies involving both of these approaches. Dunnette and Kirchner (1958) and Dunnette (1967) have argued for a combination of these approaches, using psychometric tests to identify sets of traits that bear positive relationships with success and specific situations, and then making clinical ratings based on these findings.

In reviewing the literature it appears that clinical studies have generally been more diagnostic and analytical than actuarial ones. The latter can be criticized on the basis that they are often implemented without clear underlying hypotheses. They have been largely exploratory in nature, looking for

relationships between performance criteria and long lists of assumed independent variables. However, as the following summary indicates, the results point to the possibility of further work with a situational perspective.

Actuarial Studies

Standard Oil of New Jersey. Probably the most thorough, well conceived, designed, and implemented study of this kind was the Early Identification of Management Potential (EIMP) study carried out in Standard Oil of New Jersey by Laurent (1961, 1962). The EIMP research is described in some detail because it illustrates a number of important points and serves as a model for many of the other studies done in the field. Its scope and success set it apart from much of the other research.

The two questions the research sought to answer were (1) how to measure managerial success, and (2) how to identify managers who have the potential to be successful, early in their careers. The design and methods employed in the EIMP program were based on the following underlying assumptions:

"There are significant individual differences between the most successful members of a group of managers.

Some of these differences can be measured.

A candidate for a management position will have a better chance of being successful if his individual characteristics and background are more like those of the most successful rather than the less successful.

These characteristics can be measured early in an employee's career."
(Laurent, 1968)

Analysis was performed on a sample of 443 managers, ranging from the Chairman of the Board to the second level of supervision. The average age was 48, and they had on average 21 years of service with the company. 56% had college degrees, and 36% had graduate degrees.

Managerial success was measured on the basis of three main criterion variables: position level, managerial effectiveness, and salary. Managerial effectiveness was reflected by a rating of the managers involved, by other managers, usually in higher levels in the organization. These criteria were combined to form an overall success index, independent of age and tenure.

The selection of a criterion measure is an issue of some concern for any predictive study (Smith, 1967, 1976). It can be argued that success is partly a function of being at the right place at the right time, and that the correlation between effective management practice, however that is defined, and success in terms of salary and promotion is doubtful. However,

if the objective of a study is to determine who is likely to succeed in a specific organization, as was the case in SONJ, it seems reasonable to assume that those individuals who possess characteristics and abilities similar to managers who have already demonstrated their success, are likely to be successful as well. Whether the individuals identified as "potential successfulls" will have the flexibility and adaptability to manage effectively in the face of changing conditions is also an important question. The SONJ assumption was that managers who had already achieved a degree of success had to embody these characteristics of flexibility and adaptability, and therefore the success index would be able to identify personal qualities leading to future success.

The predictors used in the study included three standardized tests, two of cognitive abilities -- The Miller Analogies Test and the Non-Verbal Reasoning Ability Test -- and one personality test -- the Guilford-Zimmerman Temperament Survey. Apart from these, employees also completed an individual history survey, a survey of management attitudes, a self-performance report, a management judgement test, a projective test based on TAT type pictures, and were interviewed by one of the researchers. Special scoring keys were developed as a result of item analysis, with

those items relating most strongly with the success index being included in the composite test score. The correlation between the composite test score and the overall success index was .70.

It should be noted that the special scoring keys developed for the programme demonstrated a much higher level of correlation with the success index than the standard test scores. The comparison is shown by tables 1-4 and 1-5. From an observer's point of view, it is unfortunate that the special keys were kept secret by SONJ because it is impossible to identify the specific personal qualities leading to success, however, the results are sufficiently encouraging to motivate other attempts.

	Sample A (N 222)		Sample B (N 221)	
	Overall Success	Ranking	Overall Success	Ranking
Miller Analogies Test	.18	.18	.17	.20
Nonverbal reasoning test	.20	.29	.08	.26
Guilford-Zimmerman Temperament Survey				
General Activity	.05	.07	.08	-.02
Restraint	.03	.04	.05	.08
Ascendance	-.08	.06	-.07	-.01
Sociability	-.07	.02	-.01	-.08
Emotional Stability	.14	.14	.13	.04
Objectivity	.08	.17	.17	.07
Friendliness	.04	.10	.11	-.01
Thoughtfulness	-.01	-.01	-.10	-.06
Personal Relations	.05	.14	.20	.11
Masculinity	.06	.23	.04	.16

Table 1-4. Correlations between standard tests and inventories and stanine scores on the success and ranking measures for two groups of SONJ managers.
(Source: Campbell, et. al. 1970, p. 168)

	Sample A (N 222)		Sample B (N 221)	
	Overall Success	Ranking	Overall Success	Ranking
Special keys based on item analyses of Guilford-Zimmerman survey	.31	.24	.32	.22
Self Performance Report	.24	.07	.23	.04
Survey of management attitudes	.25	.08	.14	.09
Interview (career information)	.21	.21	.19	.06
Interview (human rela- tions rating)	.19	.32	.19	.20
Management Judgment Test	.51	.16	.47	.17
Biographical survey keys	.63	.44	.50	.33

Table 1-5. Correlations between special scoring keys and stanine scores on the success and ranking measures for two groups of SONJ managers. (Source: Campbell, et. al., 1970, p.169)

The basic issue in this type of research is whether the data is able to discriminate between successful managers and unsuccessful managers. Figure 1-1 shows the predictive ability of test scores related to the overall success index.

In interpreting this expectancy chart, it should be borne in mind that without tests the odds of being in the superior group are 33 in 100 since the superior group is defined as being the top third. In fact, as the results show, an individual with a weighted test score in the top 20% has 76 chances in 100 of being in

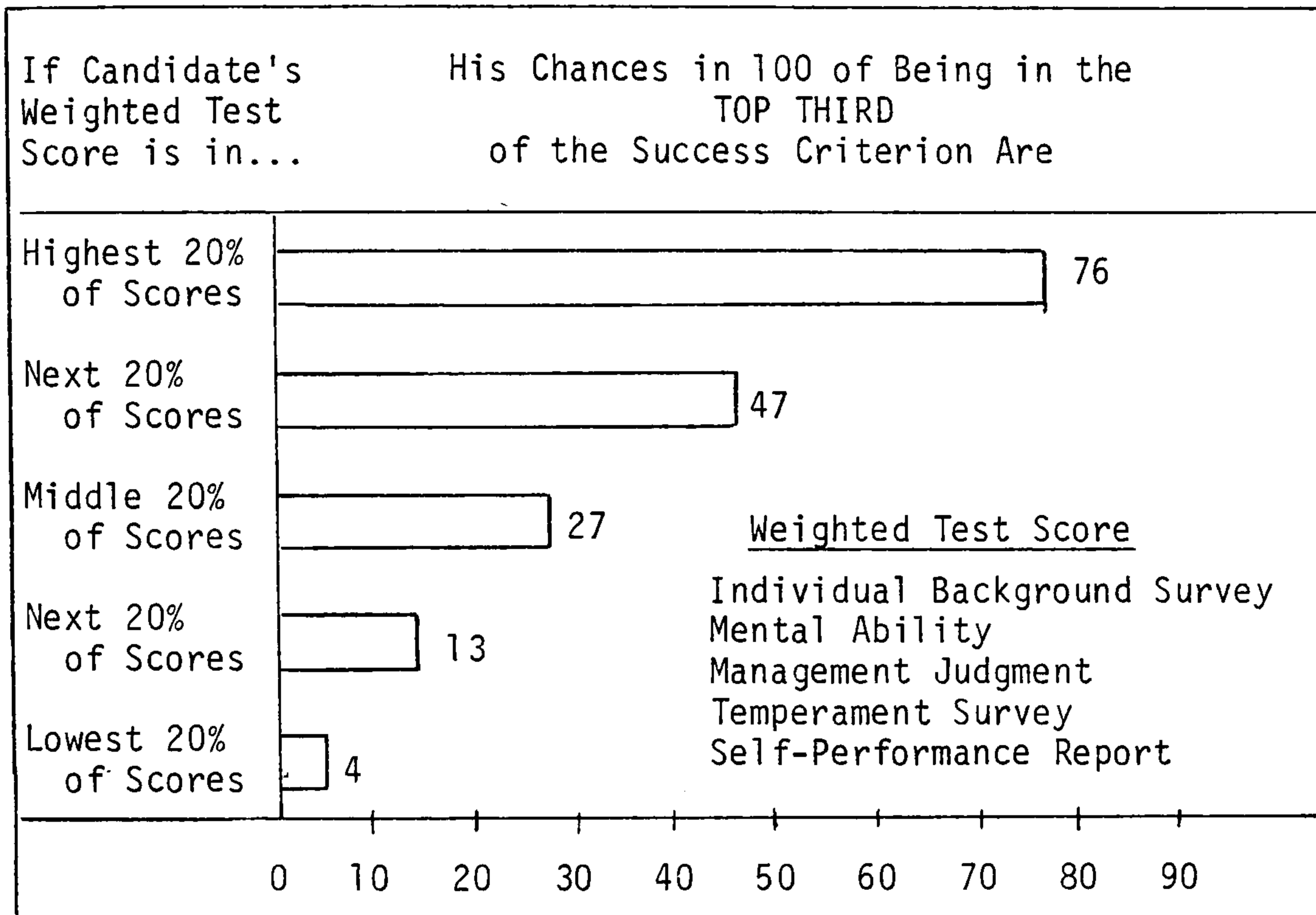


Figure 1-1 - Expectancy Chart: Predicting Top Third of Success Criterion by the Weighted Test Score.
 (Source: Laurent 1961, p.23)

the superior group; those in the next 20% have 47 chances in 100, and so on. In other words, the test results were able to improve the prediction of success.

The SONJ study is unique in having been able to attain such high levels of predictive accuracy ($r = .70$). However, it should be noted that the study was not predictive (Cronbach, 1960) in the sense that individuals are (a) tested at one point in time, with results being kept confidential, and (b) at some subsequent point in time, the test scores are related to a criterion variable. Rather, it utilized a concurrent validity paradigm, where predictor and criterion measures were collected at the same time. It is possible, therefore, that some of the data may be biased by relationships between scores and achieved success; i.e. scores of individuals who have already achieved some success may be descriptive of success rather than predictive of it. This is not a major criticism, because a number of steps were taken to correct the index for such contaminating factors as age and job tenure, and later studies in associated companies were fully predictive and still showed high correlations.

An interesting feature of the SONJ studies is that they were able to achieve such high correlations with a global measure of success and without attempting to examine possible differences in managerial jobs.

Subsequent studies, as illustrated in the rest of this review, have been unable to duplicate these results. One possible reason for the success at SONJ is put forward by Campbell, et. al. (1970) who argue that the company has a consistent policy of rotating managers from job to job, location to location, function to function, and from one associated company to another. Thus the training provided for managers in SONJ is of a much more general nature than is found in most organizations. Since the model in most organizations is one of functional specialty, it is understandable that global measures have not been as successful elsewhere.

Sears, Roebuck studies. A second major set of actuarial studies related to the prediction of managerial effectiveness were conducted in Sears, Roebuck (Bentz, 1962, 1967). The research began when the firm enlisted the aid of L.L. Thurstone during the 1940's, in the development of a battery of tests intended to identify characteristics of general executive competence. Over time, the focus of the studies centred on the prediction of managerial success.

The Sears Executive Battery of Psychology Tests includes the following instruments:

American Council on Education Test (ACE)
Problem-solving score
Linguistic score
Total score

Guilford-Martin Inventories

S - Sociability
 T - Reflectiveness
 D - Optimism
 C - Emotional control
 R - Serious vs. carefree
 G - General activity
 A - Social leadership
 M - Masculinity
 I - Self-confidence
 N - Composure
 O - Objectiveness
 Ag - Agreeableness
 Co - Tolerance

Allport-Vernon Survey of Values

Analytical
 Economic
 Aesthetic
 Social
 Political
 Religious

Kuder Preference Record

Mechanical interest
 Computational interest
 Scientific interest
 Persuasive interest
 Artistic interest
 Literary interest
 Musical interest
 Social Service interest
 Clerical interest

The Sears studies were purely psychometric in nature. Each person tested had the opportunity to have an interview with a company psychologist to discuss his test results, but was never allowed to see the written report which contained a plot of the test results and an accompanying interpretation of the scores. It is important to stress that the written reports were based solely on the test results. It is an underlying assumption of the Sears research that

there is a cluster of psychological characteristics which is descriptive of, and contributes to general executive success, regardless of job function.

Predictive research was done at two levels in the organization. First, test data was used to predict the success of lower-level personnel. An original sample of 2,000 salespeople and first-line supervisors was drawn, and after five years, each individual's progress was checked. Test results proved to be able to effectively differentiate between salespeople who were promoted and those who left, or remained at the same level. Discriminant function analysis was able to predict eventual job progress for salespeople with 71% accuracy. The comparison between promoted and non-promoted groups is shown in Table 1-6.

Mean Promoted Group	Mean Non-Promoted Group	Difference between Means	Std. Dev. of D.F.	Std. Dev. Diff.	Signif. of the Difference
3.9893	3.3875	.6018	.541	.0346	17.39*

* Significant at the .001 level

Table 1-6. Comparison on mean discriminant function or composite scores for promoted and non-promoted groups. (Source: Bentz, 1967, p.169)

In studying the differences between "outright executive failures" and executives whose work had been rated as outstanding, Bentz discovered that intellectual

ability was the strongest predictor of success. Other scores also aided in the prediction of success, however. Results at executive levels were generally significant, with multiple correlations reported around the .75 level, and rarely falling below .40. The scores on the ACE cognitive ability test were all significantly different at the .01 level when comparing success and failure groups, and the Guilford-Martin personality factors which showed significance at this level were: Sociability (S), Depression (D), General Activity (G), Social Leadership (A), Dominance (M), Inferiority (I), and Objectivity (O). The Allport-Vernon Scale of Values showed only one factor which was able to discriminate significantly at the .01 level, and that was Political Values. Similarly, the Kuder Preference Record only showed significance for the factor Persuasive Interest.

Like the Standard Oil results, these are impressive levels of prediction. What makes the Sears studies interesting from the point of view of the present research is that they are based purely on psychometric testing, and were completely predictive in the sense that scores were collected five years before the criterion measures were taken and related to the predictor variables. The criterion was generally job success or failure, but some of the studies

also used measures of employee morale.

University of Minnesota Studies. A large-scale set of studies conducted by Mahoney, et. al. (Mahoney, Jerdee, & Nash, 1960; Mahoney, Jerdee, & Carroll, 1963; Mahoney, Sorensen, Jerdee, & Nash, 1963) examined 452 managers from 13 different firms engaged in manufacturing, public utilities, agricultural products, wholesaling, and finance and insurance. The managers were predominantly middle-level, and represented a variety of functional areas.

The predictor variables consisted of a battery of tests, composed of the Wonderlic Personnel Test (general intelligence), the Empathy Test, the Strong Vocational Interest Blank, the California Psychological Inventory (personality), and a biographical questionnaire. The criterion variable was managerial effectiveness, measured in each instance by a panel of top company officials ranking subjects on management competence.

The results are not impressive. Of the 98 predictor variables tested, only 18 proved to be significant at the .1 level. Using a cutting score which produced the best possible results in terms of predicting more and less effective managers, the data was only able to predict correctly 66% of the time. However, on the basis of the findings, Mahoney,

Sorensen, Jerdee, and Nash (1963) concluded that an effective manager tends

"to have interests that are similar to other men in the business field and tends not to have interests similar to men in agriculture and skilled trades. On the average he tends to be more intelligent and more dominant than less effective managers. His biographical background shows that he has had more educational training and was more active in sports and hobbies as a young man. Also, his wife has had more educational training and worked less after marriage."

These conclusions are not particularly helpful in identifying successful managers. They are very general and reflect the low levels of significance of the majority of the predictor variables used in the Minnesota studies. A major problem with these studies is that they aggregated managers from all functions and from 13 different firms. If they indicate anything it is that there are few, if any, global characteristics of effective managers. The comparison between these results and those of the SONJ and Sears researches seems to point towards predictors of success being company specific, and perhaps function specific.

Other Studies. A number of other studies have concerned themselves with predicting managerial success. Some are of little interest to us here because they either focus on limited relationships, or use non-

standardized measurement instruments. A set of studies that falls into the latter category is the American Chamber of Commerce studies (Kirkpatrick, 1960, 1961, 1966) which used an 11-page biographical questionnaire to predict job effectiveness for Chamber of Commerce members. The interesting element in the studies is that Kirkpatrick used a critical incident technique to develop a checklist of effective executive behaviours that were used as the criterion measure. However, the generality of the results is highly limited, and the interpretation of biographical data is difficult. Do certain background experiences imply certain characteristics and behaviours that are likely to manifest themselves on the job? Are the biographical items predictive of success, or descriptive of it? For instance, do such factors as participating actively in community affairs and seeing one's family life as highly satisfying, precede success, or follow it?

A large-scale study conducted at AT&T by Bray (1962) related college success with career success. The results showed that of bright students from highly rated colleges who had been active participants in campus activities, 67% were in the top third of their salary classification, while students who had graduated from lesser-rated colleges, and who had not been active in campus affairs had only a .20 probability of being

in the top salary classification.

Other studies which have focussed on education as a predictor of career success are Selover (1962), Williams and Harrell (1964), Holland and Richards (1965), Harell (1967). Of these, only Harrell (1967) looked at personality factors, as he studied the business careers of Stanford MBA graduates. Ascendance (A) on the Guilford-Zimmerman Temperament Survey correlated positively with success. It was a significant predictor of success at the .01 level.

The Minneapolis Gas Co. study, reported in Campbell, et. al. (1970) showed a mean correlation between a variety of cognitive ability measures and supervisory and administrative salaries, of .46. Personality factors which showed correlations above .20 for the same group were the Guilford-Zimmerman factors (G) General Activity (.22), and (M) Masculinity (.28). Interestingly enough, cognitive measures showed a lower correlation for a sample of top executives (mean $r = .41$), and only the Thurston Temperament factor Reflectiveness showed a positive correlation (.36). The data given are very scanty and are not reported in publicly accessible sources.

Meyer (1963, 1965a, 1965b) initiated a program to identify promotable managers in the Jewel Tea Company, using psychometric instruments and biographical

reports. Promoted managers were found to have scored higher on general intelligence and on personality dimensions concerned with sociability, openness, confidence and flexibility. However there are some real shortcomings which tend to blur the results. To begin with, the ratings and testing were done concurrently, and it appears as though ratings were influential in subsequent promotion. Also, the subsample sizes were small in some cases and therefore hard to extrapolate.

Albright (1966) conducted a predictive study of effectiveness among field sales managers in the American Oil Company. Criterion measures were global performance ratings made by superiors, and salary growth rate. Low to moderate predictive relationships (.15 to .35) were found for intelligence, verbal skill, and personality traits of flexibility and agreeableness.

Studies by Brenner (1963a, 1963b), and Tenopyr (1960, 1961a, 1961b, 1961c, 1962, 1963, 1965), cited by Campbell et. al. (1970) showed no useful results. Brenner examined biographical reports as predictors of success and got low levels of results, and also related intelligence measures with success. In the latter case, he obtained negative correlations (Brenner, 1963a). Both studies have serious design faults, and do not exhibit any strong reversals of

the findings of the rest of the literature. Tenopyr's studies of supervisory effectiveness in North American Aviation showed low levels of results, with the exception of intelligence which was a reasonable predictor for some specific job categories.

Flanagan and Krug's (1964) study is unfortunately characterized by small sub samples, and utilizes an ungainly test battery taking about twelve hours to complete. However, it approaches the problem of predicting managerial effectiveness by specific function. Flanagan and Krug administered the SCORES battery of tests to 60 engineers in the Lockheed Corporation. They were subdivided into four groups, matched as to age, education and company experience, and differing on two criterion dimensions of position (supervisory vs. nonsupervisory, and high promotion rate vs. low promotion rate). High promotion rate managers scored significantly higher on supervision (S), organisation (O), salesmanship (S), and research (R). There were also clear differences between those engineers in management positions and those in nonsupervisory jobs. The researchers were able to assign individuals to the four subgroups, on the basis of their SCORES profiles, with 65% accuracy. This study points the way towards a greater emphasis on functional differences in the prediction of managerial success.

Tests which differentiate between functional area aptitudes may prove useful in pinpointing specific predictors of success.

The final study examined is that of Braun and Knoche (1978). It is a recent example of a predictive study using psychometric testing methods. It examined test results to see if they discriminated between effective and less-effective managers, and also investigated the stability of rating assessments over time. A subsidiary of the ANZ banking group underwent a programme of psychological testing aimed at assessing the management potential of a number of personnel, just prior to its being merged with ANZ. As a result of the merger, it was agreed that the assessments were to remain confidential, and three and seven years later, consultants were allowed access to the firm to relate the test scores to criterion measures in the form of the bank's assessment ratings of the individuals involved. No original test scores were available to the bank management. Tests employed in the original battery included measures of cognitive abilities, personality characteristics, and interests.

The results showed a clear relationship between the predictor variables and the criterion measures both three and seven years later, but an interesting finding was that, comparing the two sets of criterion

ratings, it appeared that the bank's management placed greater emphasis on personality characteristics over time, and they became stronger discriminating variables. In other words, as the level of managers increases, there would seem to be more importance given to general factors such as personality traits, rather than specific skills or cognitive abilities, in assessing effectiveness.

Clinical Studies

The term "clinical study" implies a non-psychometric approach to performance assessment and prediction. One of the problems in commenting on such studies is that they tend to employ different methods, rules and procedures, making generalization of results difficult. Clinical methods imply judgement on the part of the assessor. It is argued by proponents of a clinical approach that the scales on typical inventories are unlikely to measure the critical behavioural aspects of an individual. The clinician feels that the specific situation needs to be taken into account, and that configurations of data from a variety of sources need to be examined and interpreted. The approach is essentially an individual one. It is certainly more subjective than actuarial assessment and it requires a great deal of skill on the part of the assessor.

One of the most common forms of clinical study is the assessment centre. Finkle (1976) reports that assessment centres have been used in more than 1,000 organizations. The assessment centre method has been described by Bray (1964a, 1964b), and major studies include those by Albrecht, Glaser and Marks (1964), Bray and Grant (1966), and Bray, Campbell, and Grant (1973). Validity studies of assessment centres have been made by Austen (1969), Donaldson (1969), Jaffee, Bender, and Calvert (1970), Bentz (1971), and Byham (1971). Studies focussing on the identification of leaders through the assessment centre process include Laurent (1962), Bray and Grant (1966), Byham (1970), Dodd and Kraut (1970), and Ginsburg and Silverman (1972).

A study which reported positive results, and which was careful to keep assessments from contaminating the research data was conducted by Albrecht, Glaser, and Marks (1964). The subjects were 31 district marketing managers who completed personal history forms, intelligence tests, the Watson-Glaser Critical Thinking Appraisal, a sentence completion test and a human relations test. They also underwent a two-hour interview. The subjects were ranked, on the basis of this data, according to their predicted effectiveness in three areas of the job, (1) fore-

casting and budgetting, (2) sales performance, (3) interpersonal relationships, and finally, on a global measure, (4) overall effectiveness. These predictions were checked against assessments made one year later by a group of superiors and peers of each manager, and the clinical predictions were correlated with the rankings. Correlations with the four predictions were: (1) forecasting and budgetting, .49, (2) sales performance, .58, (3) interpersonal relationships .43, and (4) overall effectiveness .46.

Correlations were also made with results from the test data, and in all cases these latter correlations were lower than those with the clinically based predictions. This study does not pit pure clinical assessment against pure psychometric assessment. The clinical judgements were made on the basis of the test scores as well as the other data. It does, however, illustrate the power of combining these two processes. Given some test data, and some individual clinical information, predictions of success appear to be higher than by pure psychometric methods.

The Western Reserve studies of Campbell and his associates described in a series of seven articles in a single volume of Personnel Psychology (Campbell, 1962; Campbell, Otis, Liske, & Prien, 1962; Hogue, Otis & Prien, 1962; Huse, 1962; Otis, Campbell, &

Prien, 1962; Prien, 1962; Prien & Liske, 1962) take a similar approach, combining the data from psychometric tests with clinical judgements. The studies were based in different companies, and treated managers and managerial candidates at different levels. In effect, the Western Reserve psychologists acted as consultants, aiding companies to assess candidates. The assessment procedure included the completion of standardized tests such as the ACE Intelligence test, and the Guilford-Zimmerman Temperament Survey, interest inventories such as the Kuder Preference Record, and projective tests such as the Thematic Apperception Test. The candidate was also interviewed by two psychologists. A report was then written utilizing all the data on the tests and interviews. Separate ratings were made on the basis of (1) the objective tests, (2) the projective tests, (3) the written report, and (4) all the information. All ratings were made on eight dimensions of cognitive ability, leadership, and personality characteristics (intellectual capacity, leadership, social skills, persuasiveness, creativeness, planning, motivation and energy, and overall effectiveness).

At least six months later, a global rating of overall effectiveness was obtained from the managers of the individuals who had been assessed, and these

global ratings were correlated with the eight predictor assessments. The data is summarized in Table 1-7. Correlations with projective measures are lowest, and correlations with objective tests are highest. This is a strong argument for the utility of psychometric testing for predictive purposes. It tends to support the arguments put forward by Meehl (1954), and Dunnette (1967), that statistical methods of assessment are valid.

<u>Rating Dimension</u>	<u>Projective Tests</u>	<u>Objective Tests</u>	<u>All Info.</u>	<u>Report Only</u>
Social Skills	.18	.24	.13	.13
Persuasiveness	.33	.22	.22	.24
Leadership	.26	.15	.44	.28
Intellectual Capacity	.13	.35	.32	.32
Creativeness	.17	.34	.41	.23
Planning	.18	.35	.21	.29
Motivation and Energy	.03	.29	.17	.07
Overall Effectiveness	.21	.28	.28	.11
Median Correlation	.18	.29	.25	.24

Table 1-7. Correlations between Projective Test data, Objective Test data, Written Reports, and All data Combined, and Managerial Effectiveness Ratings.
(Source: Huse, 1962)

In a study that combined clinical and actuarial methods of assessment and prediction, Dunnette and Kirchner (1958) interpreted the profiles of 26 managers in the 3M company based on a battery of intelligence,

personality and interest scales and separated them into two groups of "favourables" and "unfavourables" based on the degree to which they exhibited intelligence, broad interests, and "strong" personalities. They achieved a correlation of .61 on their ratings of favourables and unfavourables with a global effectiveness score developed within the company for each individual. This study provides support for a combination of actuarial and clinical methods in predicting managerial effectiveness.

Conclusion

There is a continuing debate as to the relative effectiveness of actuarial and clinical methods of prediction and assessment. It would be difficult to come down on one side or the other with any sense of finality. What the literature appears to indicate is that both methods can be effective, supporting Cronbach's (1960) contention that it is the situation which determines when one or the other should be used.

What is clear is that actuarial methods have a positive track record. It is not as impressive as it might be, but that seems to stem from the fact that most of the studies done have not taken a situational perspective. It appears to be worthwhile to continue to investigate the use of actuarial prediction. If it can be made to work at an acceptable level, the

advantages are significant. Replication of objective testing results is much easier than it is for clinical procedures, and the costs of assessing large numbers of people are considerably lower.

CHAPTER TWO

LEADERSHIP: AN OVERVIEW

The topic of leadership continues to be of interest to managers and researchers. Hunt and Larson (1979), drawing conclusions about the direction of current research in the field, were able to refer to sixty recent studies. In the opinion of some, this continued heavy emphasis on leadership is unwarranted, and as Kelly (1974) remarks, it is a manifestation of a "perceptual astigmatism" which allows for the persistence of the belief that leadership is the critical factor affecting organizational outcomes. However, as the following summary of research indicates, there have been, and continue to be, changes in the conception and definition of leadership, and in the focus of the research.

Definition of Leadership

As McCormick and Ilgen (1980) remark, "leadership is an illusive concept because it often is used

to mean very different things". The plethora of definitions of leadership are, if not elegant, at least clear, testimony to the fact that it is an evolving concept. There are, however, almost as many definitions of leadership as there are writers on the subject.

Stogdill (1974) has classified definitions of leadership into ten types, depending on their focus:

- (1) leadership as a focus of group processes
- (2) leadership as personality and its effects
- (3) leadership as the art of inducing compliance
- (4) leadership as the exercise of influence
- (5) leadership as act or behaviour
- (6) leadership as a form of persuasion
- (7) leadership as an instrument of goal achievement
- (8) leadership as an effect of interaction
- (9) leadership as a differentiated role
- (10) leadership as the initiation of structure.

Most definitions are framed in terms of people, influence and goals. Leadership is generally seen as having to do with the inducement of people to achieve predetermined goals. The following is a sample of definitions over the last thirty years:

"Leadership is the exercise of authority and the making of decisions."
(Dubin, 1951)

"The leader is the person who creates

the most effective change in group performance." (Cattell, 1951)

Leadership is "the human factor which binds a group together and motivates it toward goals". (Davis, 1962)

Leadership behaviour is ... "the particular acts in which a leader engages in the course of directing and coordinating the work of his group members. This may involve such acts as structuring the work relations, praising or criticizing group members, and showing consideration for their welfare and feelings". (Fiedler, 1967)

"... subordinates are motivated by leader behaviour to the extent that this behaviour influences expectancies, e.g. goal paths and valences, e.g., goal attractiveness." (House & Mitchell, 1974)

"Leadership is defined as the initiation and maintenance of structure in expectation and interaction." (Stogdill, 1974)

(Leadership is) "In a simple sense, the ability to influence others; in fact a complex social skill requiring flexibility and adaptability to varying circumstances." (Kelly, 1980)

Clearly, the definition of leadership depends on the context, or focus, within which it is conceptualized. Most theorists make this point. Depending on whether one wants to take a trait, an interactional, a decision-making, a contingency, or a motivational approach to the concept, definitions can vary relatively widely.

Leadership and Management

A frequent issue in the leadership debate

concerns the differentiation between "leadership" and "management". Dubin (1979) argues that though the terms are used as synonyms, there may be a great deal of difference between an organization being managed or led. Dubin is of the opinion that "effective organizations can be managed and supervised and not led". The assumption here is that "management" involves a systematized, mechanistic, and ritualistic form of behaviour, while "leading" is concerned with personality, vision, creativity, and charisma. The argument seems contrived. While there are certainly aspects of managerial or supervisory jobs that are relatively systematized and structured, if we accept the basic ideas reflected in most of the definitions of leadership, that managers have to influence people (both subordinates and others) to accept and achieve certain goals, then "managing" and "leading" can be viewed as overlapping concepts. Management can be thought of as leadership in a formally structured organizational setting.

While we talk about leadership in this study, all the "leaders" referred to in the study sample are in fact middle managers in a large corporation, with six or more reporting subordinates. Leadership is used here as being synonymous with management.

Leadership Style

Kelly (1980) defines leadership style as "the stamp of the leader's personality on relationships with followers in group interactions, particularly in terms of role expectancies". This definition, incorporating the concepts of personality and role demands, differentiates between style and behaviour. Style is a wider concept. Managers do not change their style by altering a few behaviours. Style is described as a unique configuration of attitudes, traits and elemental behaviours.

Fiedler (1967) makes the distinction between leadership behaviour and leadership style:

Leadership behaviour refers to "the particular acts in which a leader engages in the course of directing and coordinating the work of his group members. This may involve such acts as structuring the work relations, praising or criticizing group members, and showing consideration for their welfare and feelings".

Leadership Style refers to "the underlying need structure of the individual which motivates his behaviour in various leadership situations. Leadership style thus refers to the consistency of goals or needs over different situations".

There is a perceptual element to style. Subordinates do not observe their superiors' behaviours objectively and separately from other aspects of personality, role, attitudes and beliefs. Their

perceptions are also affected by their own personalities (Heller, 1971; Evans, 1974). Clearly, leadership style, as perceived by subordinates, is a composite of a number of factors, only one of which is behaviour. There is some kind of interactive effect that assembles and integrates cues and produces a composite perception of a "style". Research by Ilgen and Fujii (1976) shows that subordinates' descriptions of leadership style tend to differ both from independent observers' descriptions, or from self-descriptions by the leaders themselves.

For the purposes of this research, a proposed definition of leadership style, consistent with Kelly's and Fiedler's definitions, and with the measurement instrument used (the Leadership Opinion Questionnaire), which is a measure of self-perceived style, is:

The relatively enduring pattern of response exhibited over a range of organizational settings.

APPROACHES TO THE STUDY OF LEADERSHIP

Leadership theory at the beginning of the century was dominated by what might be termed the "Great Man Theory", which held that certain qualities were inherent in certain people, and that these qualities ensured that their owners became leaders. The

importance of leadership was exemplified by the sentiments expressed by Emerson, "An institution is the lengthened shadow of one man", "There is properly no history; only biography", and Carlyle, "The history of the world is but the biography of great men".

This concept dominated the research and writing on leadership until the '30's. Examples of studies which attempted to analyze and list the characteristics of successful individuals are: Carlson and Harrell (1942), Davis (1930), Peck (1931), Sorokin (1927), and Taussig and Joslyn (1932). They considered politicians, businessmen, and leaders of social movements, but other studies looked at the characteristics of such groups as high school seniors (Reynolds, 1944), adolescent boys (Schuler, 1935), and gang members (Thrasher, 1927).

The Trait Approach

Prior to the 1930's, leadership was seen as something an individual "had" rather than "learned". Studies focussed on the characteristics of "natural" or "born" leaders. The extreme position of the trait approach is that specific characteristics, acting singly, determine leadership effectiveness. Those who subscribe to this view would tend to believe that leaders are born rather than made, and that leadership style is therefore deeply and firmly rooted in the personality, a product to some degree of genetic

inheritance. Leaders simply manifest "leadership qualities", which, much like the characteristics of abandoned or disguised royalty in children's fairy tales, they find difficult, if not impossible, to suppress.

A more empirical approach to trait study was demonstrated by the landmark study of Terman (1904). He hypothesized that leadership was an evolutionary concept, with "stages" of leadership varying in sophistication from animals, to primitive people, to children, etc. While this hypothesis was not formally tested, Terman did study the characteristics of leaders among a large group of school children. Terman listed forty-five "leadership qualities" which resulted from his study. These included such things as: "good looks; lively; jolly, strange; courage; activity; an only child; wit; smoked; uses slang; musical ability". Terman's study also suggested a number of other factors involved with leadership, such as the leader's function in achieving the followers' goals, and the link between a specific type of leader and a specific group task or purpose. However, it was basically taken as a springboard for a psychological approach to trait analysis which continued largely unabated until 1948.

Interest in the trait approach to leadership waned sharply after Stogdill's (1948) classic review

of the trait studies to date. He summarized the findings from 124 studies of personal factors associated with leadership, and identified twenty-nine factors which appeared in three or more separate studies.

The types of studies which were included in the review were:

- observation of behaviour in group situations
- choice of associates (voting)
- nomination or rating by qualified observers
- selection (and rating or testing) of persons occupying positions of leadership
- analysis of biographical and case history data.

The review, therefore, represented data from a number of approaches to the study of leadership and gave a fair picture of the trait view.

Stogdill concluded that general traits were not effective predictors of leadership. He suggested, however, that clusters of traits were likely to vary with the requirements of different situations, and that, if the situation were taken into account, there might be some validity to trait analysis. Unfortunately, he concluded his 1948 review with the following remark:

"The qualities, characteristics, and skills required in a leader are determined to a large extent by the demands of the situation

in which he is to function as a leader."

and the chase was on for the new Grail, "the situation".

The Situationist Approach

The situationist approach, at its extreme, denied the influence of individual differences and focussed solely on the requirements for specific behaviour inherent in different environments. It attributed all variance in style to situational determinants. Leadership was seen as reactive; the ultimate skill of a manager was therefore flexibility to adjust to the demands of varied settings. The view of early theorists like Bogardus (1918) and Hocking (1924) that leadership is purely a function of group needs and demands, is still seen today. Reddin (1970), a strong situationist, defines the leader as "a person seen by others as being primarily responsible for achieving group objectives".

Trait and Situation

Stogdill (1974) completed a second review of leadership trait research, encompassing the period from 1948 to 1970, which led him to conclusions that have tended to modify the extreme trait and situationist positions. After examining 163 studies of leader characteristics between the period of 1948 and 1970, Stogdill concluded that:

"The characteristics, considered singly, hold little diagnostic or predictive significance."

However, he goes on to remark that in combination, there are a number of characteristics which appear to interact to differentiate (1) leaders from followers, (2) effective from ineffective leaders, and (3) higher level from lower level leaders. These characteristics include the following:

- a strong drive for responsibility and task completion,
- vigor and persistence in pursuit of goals,
- venturesomeness and originality in problem solving,
- drive to exercise initiative in social situations,
- self-confidence and sense of personal identity,
- willingness to accept consequences of decision and action,
- readiness to absorb interpersonal stress,
- willingness to tolerate frustration and delay,
- ability to influence other persons' behaviour,
- capacity to structure social interaction systems to the purpose at hand. (Stogdill, 1974)

Clearly, personality does have a bearing on leadership effectiveness. But so do situational variables. The relationship between personality and situation is not made clear by Stogdill, but it would appear that they interact in some fashion to determine success in leadership positions.

The Group Approach

Leadership can be defined as the ability to influence the behaviour of people in a group. If this position is taken, then any member of a group can adopt a leadership role. This is the underlying basis for the group approach to leadership. Gibb (1954) and Hollander (1964) developed the idea that the leader was a part of an interrelated set of roles which comprised the group, and that his role as leader was to aid the group in its achievement of a commonly agreed upon goal. This line of thinking has led to the group dynamics movement which has explored the workings of "leaderless" groups, and the relationships between formal leadership and informal leadership. The types of leadership which emerge in these situations are dependent on the task, the group itself, and the situation.

The group approach is the domain of social psychologists. While the T-group movement has grown, developed, and splintered into a number of variants,

this basic approach to leadership has rather tenuous ties to the realities of managerial leadership in formal organizations. There is a great deal of knowledge about how informal leaders emerge, how groups function, and how unstructured situations are dealt with, but until very recently, this branch of inquiry has not come to grips with the realities of power differentials and formal authority relationships. However, it was the concept of the leader interacting with other members of a group that provided the impetus for the two major research efforts at Ohio State University and the University of Michigan.

Effective Leader Behaviour

As it became clear that no stable and situationally invariant personality characteristics could distinguish between effective and ineffective leaders, attention turned to focussing on behaviour patterns of leaders. The underlying assumption was that if ineffective and effective leaders could not be differentiated on the basis of personal characteristics, perhaps they could be identified by certain behaviour patterns which they exhibited. This approach was taken by research at both Michigan and Ohio State.

The Ohio State Studies. The Ohio State studies (Stogdill, Shartle, et.al., 1956; Stogdill, & Coons, 1957; etc.) identified four factors, derived

from factor analysis of questionnaire responses that appeared to represent almost all the accountable common variance in leadership behaviour. The first two factors, Consideration, and Initiating Structure, accounted for 83% of the variance, while the second pair, Production Emphasis, and Social Sensitivity, accounted for the remaining 17% (Fleishman, et.al., 1955). Consideration encompasses behaviour that is "indicative of friendship, mutual trust, respect, and warmth", while Initiating Structure includes behaviour where "the supervisor organizes and defines group activities and his relation to the group (Halpin & Winer, 1957).

The second two factors, which tend to have been forgotten in the subsequent research, concerned behaviour in which the leader was motivation oriented (Production Emphasis), and where behaviour showed the leader's sensitivity to social relationships (Social Sensitivity). Because of the seeming overlap of these two factors with Initiating Structure and Consideration, and the fact that they accounted for such a small percentage of the variance in leadership behaviour, they were dropped from the main thrust of the research of Ohio State.

Two major measures of Initiating Structure and Consideration were developed: (1) the Leader Behaviour Description Questionnaire (LBDQ), (Hemphill & Coons,

1957; Halpin & Winer, 1957; Fleishman, 1957a), and (2) the Leadership Opinion Questionnaire (LOQ), (Fleishman, 1957b). The LBDQ is used in situations where subordinates are asked to describe the behaviour of their superiors, and the LOQ where supervisors are asked to describe how they think they should behave to be most effective.

Fleishman (1969) makes the claim for the LOQ, that, "an important feature of this questionnaire is that the scores on each scale are independent of one another", and he supports this with correlation coefficients between Consideration and Initiating Structure scores from 17 sample groups. This independence of the two variables means that managers can exhibit any combination of Consideration or Structure. They may be high on both, low on both, or high on one and low on the other. However, studies examining the description of leader behaviour in terms of subordinate perceptions of Structure and Consideration have indicated that the two variables are not perceived as being independent. Lowin, Hrapchak and Kavanagh (1969) showed that subordinate perceptions of their supervisor's behaviour varied depending on the degree of Initiating Structure exhibited, and perceived. Consideration scores varied with the level of perceived Initiating Structure. Hosking and Morley (1979) showed similar results. When Consideration was high,

decreasing Initiating Structure increased the level of perceived Consideration, and increasing Consideration resulted in an increase in the perceived level of Structure.

The initial hope of the research leading to Consideration and Initiating Structure was that an examination of leader behaviours would lead to the discovery of a pattern of effective leadership. Using such effectiveness criteria as turnover rate, grievance levels, and technical competence, Korman (1966) reviewed all of the available literature and was unable to show any strong correlations between leadership behaviour and effectiveness. Thus the stage was set for the incorporation of situational variables into the study of leadership effectiveness; the so-called contingency approach.

The Michigan Studies. At about the same time as the Ohio State studies were being conducted, a second major research effort was taking place at the University of Michigan. The goals were essentially the same: to find a pattern of leadership behaviour that resulted in effective outcomes. The focus was on finding the differences between effective and ineffective leader behaviour, and the studies were approached with little or no preconceived notions about leadership.

Early studies by Katz, Maccoby and Morse (1950), and Katz, Maccoby, Guring and Floor (1951) illustrate the methodology of the Michigan studies. A number of work groups were identified in the organizations under study, half of which were high, and half of which were low in productivity, according to company records. The high and low producing groups were matched by size and type of work, and differences in supervisory behaviour were measured. The results indicated that the high production supervisors tended to be more employee-oriented, exercised general rather than close supervision over their subordinates, and differentiated their roles from those of their subordinates.

The Michigan studies have been summarized by Likert (1961, 1967). The conclusions drawn from the research were that: effective leaders tend to be more employee-centered, and supportive, and tend to increase their subordinates' feeling of self-worth and esteem; the more effective leaders also tend to use the group in decision-making processes more than a one-to-one method; and more effective supervisors tend to set high performance goals for their work groups.

While these appear on the surface to be patterns of effective leader behaviour, further consideration shows that there is a relatively wide range of actual behaviours that can result in subordinate

self-esteem, in group-based decision-making, or the setting of high performance goals. The specific behaviours can be quite different, and yet achieve the same sorts of results. Therefore, while the Michigan studies provided some general principles of leadership, they fall short of prescribing specific actions in concrete daily situations.

A second major criticism levelled at the Michigan studies is that they are based on the assumption that employee-centered and task-centered behaviour are continuous variables. A manager must therefore choose between one or the other as a basic behavioural and attitudinal stance. This is quite different from the findings of Ohio State that Structure and Consideration are essentially independent. The weight of opinion seems to have fallen on the side of a degree of independence between the two variables.

Situational Approaches

The inadequacies of the Ohio and Michigan studies in terms of being able to determine the traits or behaviours characteristic of effective leadership have led to the belief that the problem is more complex than simply looking for specific behaviours that lead to productivity, and that much depends on the situation in which specific behaviour is exhibited. Gibb (1969) and Palmer (1974) have suggested that,

- (1) certain leadership traits or behaviours may be effective in some situations and not in others,
- (2) different leaders, with different traits, may be effective in the same situation, and
- (3) the emphasis in the research into personality traits of leaders must be combined with a situational analysis encompassing followers and other situational variables.

The focus of the various situational approaches to leadership has been either one, or a combination of, (a) an empirical examination of traits and behaviours which are effective in specific situations, or (b) theoretical models capable of dealing with different traits and behaviours and different situations. The leading example of the first type of research is Fiedler (1967) who has conducted studies for the past twenty-five years examining the relationships between style, situation and effectiveness.

Fiedler's Contingency Model. The contingency model of leadership effectiveness was inductively developed by Fiedler as a result of findings from fifteen years of research on interacting groups (Fiedler, 1964, 1967). The underlying hypothesis of the

contingency model is that performance of interacting groups is dependent on the interaction of leadership style and situational favourableness.

Leadership style is measured by an instrument known as the Least Preferred Co-Worker scale (LPC) which asks the respondent to think of the person with whom he can work least well, of all the co-workers he has ever had, and then to describe that person by rating him or her on an eight point set of bipolar adjectives, such as supportive-hostile, friendly-unfriendly, pleasant-unpleasant, cooperative-uncooperative, etc. The LPC is a component of an earlier measure called the Assumed Similarity Between Opposites (ASO). The score on the LPC is obtained by totalling scores for each item, with a high score indicating favourable description and a low score an unfavourable description of the least preferred co-worker.

Interpretation of the LPC score is a matter for some considerable debate, as a critique of the model will demonstrate. But Fiedler interprets it as a reflection of task or relationships orientation. A low LPC score is indicative of high task orientation, while a high LPC score indicates relationships orientation, on the basic assumption that highly task-oriented individuals derive their major satisfaction from task accomplishments and therefore tend to look upon others who do not share the same values with

disdain, while relationships-oriented individuals tend to be able to separate work performance and personality and are therefore more willing to be tolerant of divergent attitudes and behaviours in others.

The second variable in the model, situational favourableness, is defined as the degree to which the situation itself provides the leader with potential power and influence over the group's behaviour (Fiedler, 1967). The three component dimensions of this variable are: task structure, leader-member relations, and position power. Task structure refers to the degree to which the task is structured, or programmed, and is measured by a four-dimensional scale developed by Shaw (1963) which measures goal clarity, decision variability, solution specificity, and goal path multiplicity. Leader-member relations are defined as the evaluations of each of the parties' reactions towards one another (measured by leader ratings of the group atmosphere, group member ratings of the group atmosphere, and sociometric ratings of the degree to which the leader is chosen by group members). Position power is defined as the extent to which the leader has reward, coercive, and position power over group members.

Each of the situational dimensions -- leader-member relations, task structure, and position power -- is split into two levels (good-poor, high-low,

strong-weak) to create eight situational types that vary in favourableness. These "octants" are summarized in Table 2-1 below, which also summarizes the relationship between leaders' LPC scores and group effectiveness measures for each of the octants, based on a number of studies. The criterion measure of the model, leadership effectiveness, is defined in terms of group performance on its major assigned task.

Situational Classification

Octant	Leader-member relation	Task structure	Position power	Median rho	Number of correlations
I	good	high	strong	-.52	8
II	good	high	weak	-.58	3
III	good	low	strong	-.33	12
IV	good	low	weak	.47	10
V	poor	high	strong	.42	6
VI	poor	high	weak	----	0
VII	poor	low	strong	.05	12
VIII	poor	low	weak	-.43	12

Table 2-1. Median correlations between LPC scores and group effectiveness in the eight situational octants of studies used to develop the contingency model. (Source: Ashour, (1973a).

Fiedler's hypothesis that performance of interacting groups is dependent on the interaction of leadership style and situation favourableness is

supported by his research findings that show that when the situation is either highly favourable, or highly unfavourable for the leader, a task-centered style is most appropriate, but when the situation is only moderately favourable or moderately unfavourable, a relationships-centered style is most effective. As Vroom (1976) remarks, however, "Whenever a theory has been arrived at by inductive means, it is critical that it be validated by determining its ability to predict results other than those which entered into its formulation". It is here that the contingency theory gets into hot water. Graen, et.al. (1970) compared the results of the studies used for the development of the model with those used to test it, and found significant differences between the two sets of mean correlations for the different octants. Their conclusion was that the predictions made by the model were not supported by the evidential results. Fiedler (1971) separated field studies from laboratory studies and argued that while the latter did not fully support the model, the data from the former were in the predicted directions and therefore validated the model. (Ashour (1973a), however, examined the correlations presented by Fiedler and found that the field data on which Fiedler had claimed support for his model contained only one statistically significant correlation out of some 19 correlations presented. His strongly argued conclusion

was that "the empirical evidence does not provide conclusive support for the contingency model".

Ashour (1973a, and 1973b) evaluated the contingency model on the basis of its empirical validity, its methodological rigor, and its theoretical adequacy, and was highly critical on all dimensions. Schriesheim and Kerr (1977) discussed the adequacy of the theory on the basis of five criteria put forward by Filley, House, and Kerr (1976) --- internal consistency, external consistency, operational properties, generality, and parsimony --- and drew the following conclusion:

"The Contingency Theory of leadership is probably the most widely known of all situational leadership theories, and has done far more than any other to stimulate thought about the importance of situational moderators. Today, however, it is obvious that the theory suffers from several major shortcomings and problems which are sufficient to seriously impair its usefulness." (Schriesheim & Kerr, 1977)

Fiedler's contingency model, despite its obvious weaknesses and faults, represents a major step forward in leadership theory and research. Many writers have commented on the need for a situational approach and have urged research into the different conditions under which specific leadership styles are effective (e.g. O'Brien, 1969), but Fiedler is the first person to make an ambitious attempt to qualify just what is meant by "the situation" and to delineate specific situational

variables with which leadership style and performance can be correlated. Contingency theory has been the target of much debate, much criticism, and much acrimony. Fiedler has defended the theory valiantly (Fiedler, 1966, 1973, 1977), and studies by Hunt (1967), Hill (1969), and Mitchell (1969) have been used as arguments for its validation. However, in addition to the studies already cited in opposition to the model, Graen, Orris and Alvares (1971) failed to support the predicted interactions in a laboratory experiment designed to test the theory, and McMahon (1972), and Shiflett (1973, 1974) have also been critical. The battle, on a detailed level, appears to have been lost by Fiedler, but the contribution to the field remains great, attested to by the devotion of the 1973 Carbondale Symposium to contingency approaches to leadership (Hunt & Larson, 1974).

Other Branches of Situationally-Based

Leadership Style Theory

Leadership research still thrives. Several new approaches have been taken. House (1971, 1973), House and Dessler (1974) and House and Mitchell (1974) have developed the path-goal theory of leadership which examines the interaction of leader

behaviours and situational variables as it effects the motivations of subordinates. Vroom and Yetton (1973) have developed a model for choosing among various decision-making approaches, depending on situational variables. Pinder and Pinto (1974), and Bourgeois et al. (1975) have attempted to relate demographic variables to management styles. And, most recently, Schreisheim, Mowday and Stogdill (1979) have initiated work towards building and validating a new model relating leader behaviours and group variables as they affect group productivity and such criterion variables as absenteeism, satisfaction and turnover.

Path-Goal Theory of Leadership. The path-goal theory developed out of the fact that House's earlier research into Initiating Structure and Consideration generated some contradictory results. He found, for instance, that Initiating Structure for unskilled and semi-skilled workers caused dissatisfaction, while for high-level employees it brought about a reduction in role conflict and ambiguity. At the same time, he found that leaders who are high in Initiating Structure are rated highly by superiors and have more productive work groups, while leaders who are more Considerate, have more satisfied subordinates. By focussing on the impact leaders have on their subordinates' motivation, ability to perform effectively, and satisfaction, the

theory hypothesizes that "a leader's behavior is motivating or satisfying to the degree that the behaviour increases subordinate goal attainment and clarifies the paths to these goals" (House & Mitchell, 1974).

While the leader's function consists of clarifying the path to goal attainment for his or her subordinates, and increasing the payoffs for work-goal attainment, there are two contingency variables hypothesized by the path-goal theory. These are (1) the personal characteristics of the subordinates, and (2) the environmental pressures and demands with which subordinates must cope to accomplish the work goals and satisfy their needs. Figure 2-1 provides an overview of the path-goal theory. Leader behaviours are classified as either directive, supportive, achievement-oriented, or participative, while the two contingency factors which interact with these behaviours, subordinate characteristics and environmental factors, are each broken down into more specific variables. Subordinate characteristics are assessed on the degree to which subordinates perceive their ability, locus of control and authoritarianism, while environmental factors include the task, the formal authority system, and the primary work groups of the subordinates.

Path-goal theory represents an interesting direction for research, but it is still relatively undeveloped. Kelly (1980) comments that it has "stimulated

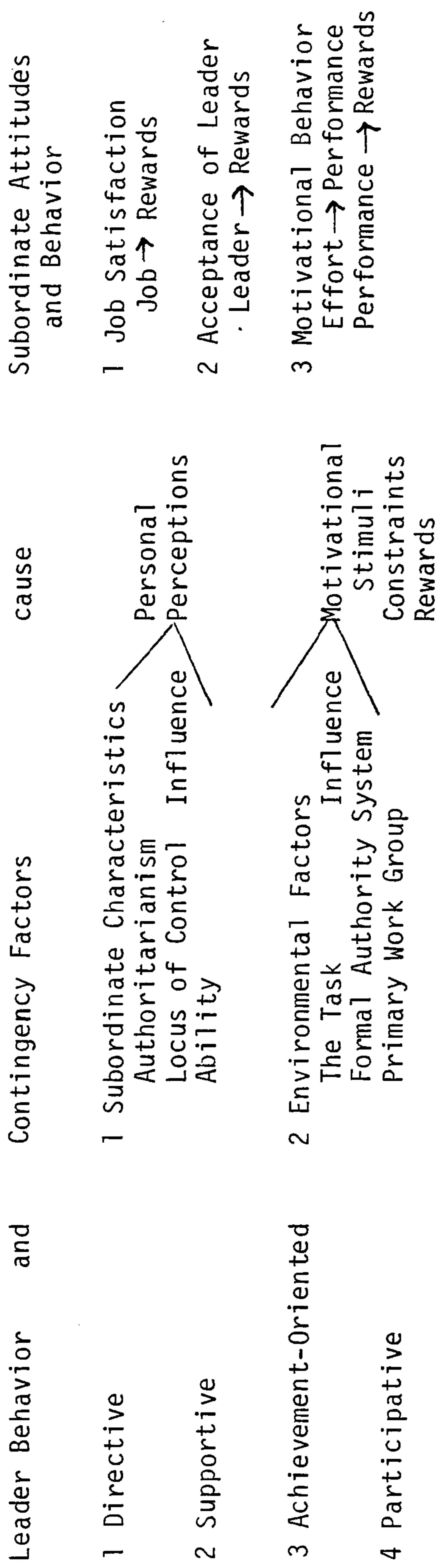


Figure 2-1. A summary of path-goal relationships hypothesized by House and Mitchell.

(Source: House, R.J., & Mitchell, T.R. "Path-goal theory of Leadership." Journal of Contemporary Business, 1974 (Autumn), 89.

much research, but more needs to be done to flesh out the model empirically". Schreisheim and Kerr (1977) make similar observations, calling for improvement of the operational properties of the theory, and a more detailed and comprehensive treatment of the variables and their interrelationships.

Vroom's Model of Leadership and Decision-Making. Vroom has developed a model of leadership with Yetton (Vroom & Yetton, 1973) which argues for varying degrees of participation in decision-making depending on the situation. The dependent variables in the model are task and goal achievement, and group satisfaction and commitment. Five methods for decision-making are enumerated, reflecting varying degrees of participation by subordinates (from the manager making the decision on the basis of information available to him at the time, to the manager sharing the problem with subordinates as a group and attempting to reach a consensus decision). The process of decision-making is then subjected to an analysis of the degree to which the quality of the decision, or the acceptance and commitment to it, is important, and the amount of time that can be allotted to making it.

There have been no long-term evaluations of the model, but it does raise the issue of contingencies for practising managers who are introduced to the process. As a model of leadership behaviour, it is limited by its focus on decision-making, although it does raise the issue of style more generally by looking at the appropriate degree of participation required in varying situations. Its major use, at the present time, appears to be in the area of management training and development. It has a "practical" basis in decision-making which makes it attractive to managers, and it is also able to raise the larger issue of style within that context.

The Demographic Approach. Bourgeois et. al.

(1975), and Pinder and Pinto (1974) have explored a new set of situational variables. Their focus has been on demographics such as sex, salary, and schooling, and the relationship between these variables and personality and style of managers. The Bourgeois study took place in the Canadian public service and attempted to isolate, through statistical sub-grouping, a number of management styles using an in-basket technique. These styles were then related to a number of demographic variables. Four management styles were identified, but of the twelve demographic variables tested, only five showed significant correlations with style (years employed, age, graduate degree specialization --

management versus non-management --, and nature of current work -- generalist versus specialist).

The concept of demographic variables being related to leadership effectiveness is an interesting one, and is hinted at by a number of other theorists in terms of findings concerning positional level, type of work, etc., but the approach taken by Bourgeois, et.al., lacks sophistication and is unlikely to yield much more than some rough correlations between poorly defined variables.

The Leader-Group Interaction Model. It is inappropriate to comment here in any depth about the model proposed by Schreisheim, Mowday and Stogdill (1977). It follows in the footsteps of Fiedler (1967) and Shutz (1958). In some ways it is reminiscent of the early days of trait and situationist theorizing where swings away from and back to each position occurred. This sort of model represents a reconceptualization of an old paradigm. It exhibits some fresh thinking, but it is doubtful if it could be classified as a major theoretical advance. Child and Hosking (1977) give the attempt somewhat short shrift. However, without such attempts at reconceptualization and reconstruction, the field would soon atrophy. In spite of the fact that the authors get rather sharply criticized for the shortcomings of the model, it is a healthy

sign to see continued attempts to advance the field. As Fiedler (1977) remarks at the beginning of his rebuttal of Schreisheim and Kerr's (1977) scathing review of the contingency model,

"How fortunate that bruises are so rarely fatal. Otherwise the death rate of psychologists, beating their breasts over the imminent demise of leadership theory would be truly alarming."

Leadership and Personality

Stogdill (1974) provides a solid base for the hypothesis that personality variables are related to success in organizational settings. Further support is given by Mann (1959) who remarks that, "an individual's leadership status in groups is a joint function of his personality and the particular group setting". An examination of Mann's results indicates that four of the personality characteristics examined in this research study are positively related to managerial effectiveness and success (Adjustment, Extroversion, Dominance, and Masculinity).

Many authors use the concepts of style and personality without clear differentiation (Vroom, 1959, 1960; Blake and Mouton, 1964; Hersey and Blanchard, 1969), and some suggest that leadership style is a result of personality and situational factors (Yukl, 1968). Support for this latter position is provided

by Tannenbaum and Allport (1956) who studied the interaction between personality and work setting. Tannenbaum (1957) concluded that personality changes occurred because of a tendency toward equilibrium with environmental conditions.

Webber (1966) drew the following conclusions from his doctoral research:

- (1) managers in similar positions tend to behave similarly;
- (2) on the average, position demands influence a manager's behaviour more than his personality does;
- (3) position, personality and behaviour patterns combine to form specific combinations leading to successful performance.

Leadership and Perception

It can be argued that it is not the situation which influences leadership style, but the perception of the situation. Lowin et.al. (1969), and Hosking and Morley (1979) have shown that perception of Consideration depend on levels of Initiating Structure built into situations, and vice-versa. Hollander (1971) has argued for the inclusion of perception as a situational element in leadership research.

There is a wide variety and number of studies dealing with perception as a variable in the leadership

process. Dansereau, Graen and Haga (1975) have pointed out that a number of studies comparing a superior's perception of his style, in terms of Consideration and Initiating Structure, with the consensus perception of subordinates of the superior's style, show almost no correlation. Justis (1975) has shown that when subordinates perceive themselves as being less dependent on the superior, his competence has a lower impact on performance; Murnighan and Leung (1976) have found that leader participation only leads to improved performance when subordinates perceive the task as being important; and O'Reilly and Roberts (1978) have indicated that leaders have less effect on subordinate satisfaction and performance when they are perceived to have low influence and subordinates have low mobility aspirations.

Since perception is interrelated with personality, both in terms of development and interactions with the environment, all contingency models have as an underlying assumption (often unstated) that both leader and follower behaviour are a function of interpersonal and situational perception. While the phenomenon is recognized, there has not been an exhaustive effort to integrate measures of perceptual acuity into leadership research.

Conclusion

While a contingency approach seems to have become a major thrust in leadership research, there have been some serious questions raised about the general methodology. Korman (1968) argues that contingency approaches are static, that is, they do not take into account that the environment may affect the person over time, and that these effects may vary according to the particular personality of the person. And he further argues that one has to be able to measure accurately beforehand, when the situation is changing or changed in order to be able to make the requisite style alterations. However, in Korman's view, the instruments are not available for such accurate measurement, and he would rather focus on style as much as possible before bringing in contingency factors.

There is still a large body of research focusing on a variety of situational variables and their relationship with leadership style and behaviour, as demonstrated by Mitchell's (1979) review of the recent Organizational Behaviour literature, and by the continuing focus on contingency approaches in the Carbondale Symposia (Hunt & Larson, 1974, 1977, 1979). But while there is a continuing stream of studies examining a host of situational variables, there remains the difficulty of measuring the interactive effect of all these

factors, both with each other and with leader performance. The problem is analagous to that faced in cancer research where the causative variables may be additive, multiplicative, partially interactive, active in certain situations and not in others, etc.

The ideal outcome of situationally based leadership research would be, as Vroom (1976) puts it, to have "a set of concepts which are capable of dealing with differences in situations and a parallel set of concepts capable of dealing with differences among leaders or their styles". This research does not have the scope or intention to attempt that. But rather, it takes a more pragmatic, short-term view, in attempting to provide a means whereby some organizations may be able to control for situational differences simply by controlling for job type. This approach has been used by Kehoe (1974) in a study of organizational climate.

CHAPTER THREE

PERSONALITY AND ASSESSMENT

Personality psychology is concerned with the search for reliable statements about either the personality or about the directly observed behaviour of one or more persons (Mischel, 1968). A basic problem that underlies personality theory and research, however, is that behavioural observations, or inferences made by different psychologists can be interpreted in a wide variety of ways, depending on the theory and constructs through which they are viewed. There is no single concept or definition of personality. In fact, Allport (1937) listed in excess of fifty definitions, and the list has no doubt grown considerably since then, as new models, tests, and theories have developed. As Helson and Mitchell (1978) remark in their review of the personality literature for the Annual Review of Psychology, "Within psychology, people are still arguing about whether there is such a thing as personality, or even referring to it as a myth now dispelled."

A basic argument in personality theory centers on whether individuals possess the same basic traits, but in differing degrees - the nomothetic approach - or whether every individual possesses a unique set of traits, applicable to him alone - the idiographic approach. A nomothetic approach permits the comparison of personality profiles of separate individuals, while an idiographic approach maintains that comparison of different individuals is impossible, since they have no common traits; each person is unique and can only be understood in terms of himself.

The essence of the two approaches is captured in quotations from Eysenck (1951) and Allport (1962), exponents of the two extremes. Eysenck, reflecting the nomothetic view, expresses the opinion that, "Science is not interested in the unique event, the unique belongs to history, not to science". Allport, on the other hand, remarks, "... I venture the opinion that all the infra-human vertebrates in the world differ less from one another in psychological functioning and in complexity of organization, than one human being".

Since one can debate the basic issue of whether people are fundamentally similar in makeup and can be compared on some basis with one another, or whether they are completely different and individualistic, the question of how to measure personality is also

debatable. Should we, at one extreme, assume that all people are different, and treat them as discrete cases, or should we assume some underlying basis of similarity and look for differences within certain parameters? This is a critical issue for researchers since the choice of a theory of personality in large measure dictates the measurement method, and vice-versa.

Approaches to the Measurement of Personality

There are a number of different approaches to the measurement of personality. By the same token, there are a number of different classification systems of these approaches. A useful classification is presented by Wing (1968), who groups personality measurement into three main types: (1) clinical observation, (2) experimental manipulation, and (3) statistical manipulation. Meehl (1954) has discussed the relative merits of a statistical versus a clinical approach to prediction, and on the basis of his summary of the available evidence has come down strongly in favour of statistical methods. Holt (1958) has disputed this conclusion.

Some of the main arguments for each of the clinical, experimental, and statistical approaches to personality measurement are briefly presented below, in order to put the choice made in this study into context.

The Clinical Approach. The main characteristic of the clinical approach to the measurement of personality is its focus on the individual. The clinical approach looks at the "whole" personality, rather than any particular set of traits and behaviours, and attempts to understand the individual within the context of his personal history and development. Its analysis is based on a thorough understanding of the individual, and this depth of understanding cannot be achieved by comparing an individual's traits with group norms or by viewing him at any specific instant in time.

The essence of the clinical viewpoint is expressed by Allport (1961),

"To say that 85 in 100 boys having such a background will become delinquent is not to say that Jimmy, who has this background, has 85 in 100 chances of being delinquent. ... Only a complete knowledge of Jimmy will enable us to predict for sure."

The clinical approach to personality measurement deals with the concepts of underlying motivations, adjustment mechanisms, defense mechanisms, the handling of conflicts, etc. It is concerned with certain hypothesized "internal" processes and structures. The wide number of different hypothesized processes and structures within the field of clinical theory make it very difficult to compare approaches.

The major problem, from a research point of

view, with using a clinical approach to personality measurement, is that the clinician's perceptions depend largely on his theoretical background and beliefs.

As Pervin (1970) remarks:

"An assessment technique which depends on the skill of the particular examiner has limited general utility, and is in particular difficulty where the qualities of exceptional examiners are hard to define and where few rules can be developed for formalizing their assessment and prediction procedures."

The Experimental Approach. An experimental approach to the measurement of personality is characterized by the following basic characteristics:

- the behaviour to be observed is stipulated in advance
- measurement is taken at a specific point in time
- it usually involves a number of subjects divided into groups, with each group being subjected to different environmental influences
- some of the research may be carried on with animals as subjects.

As the name implies, the experimental approach attempts to adopt the classical principles of scientific experimentation. There is a clear statement of hypotheses, in terms of the measurement conditions; the dependent variable is some selected form of behaviour;

the environmental conditions make up the independent variables; strict controls are imposed to limit the manipulation of only one or two independent variables at a time; personality constructs are seen as intervening variables.

The major problem, from a research point of view, of the experimental approach to personality measurement, is that the experimental conditions required preclude the possibility of "real life" studies. Many of the experimental or quasi-experimental studies, for instance, are performed with groups of students, or school children, etc., and take place in "laboratory" conditions which call their inferences to the managerial world into question (e.g. Maas, 1950, etc.).

The underlying problem of this type of measurement is that it tends to take too simplistic a view. It assumes that the relationships between independent and dependent variables are rather simple and uncluttered. As Cattell (1967) remarks,

"The univariate, laboratory method, with its isolation of the single process, has worked well in the older sciences, but where total organisms have to be studied, the theoretical possibility must be faced that one can sometimes hope to find a law only if the total organism is included in the observations and experiences - not just a bit of its behaviour."

The Statistical Approach. The statistical approach to the measurement of personality is characterized by the following:

- its focus is the personality "as a whole"
- it involves rigorous quantitative measurement
- it usually deals with a large number of subjects at a time
- it is concerned with normal rather than abnormal subjects (part of the handling of large numbers of subjects allows for entire "populations" to be included in the data gathering process)
- the role of the researcher is standardized, as in the experimental approach, during the measurement phase, and is interpretive, as in the clinical approach, during the analytical phase.

Its advantages are its ability to handle large numbers of variables simultaneously, and therefore its focus on the personality in toto, its applicability in the real life situation as opposed to a laboratory situation, and its emphasis on rigorous measurement.

Dunnette (1967) argues for a statistical approach to measurement in studies concerned with prediction of managerial effectiveness and success on the basis that,

- (a) it provides more information than a clinical approach, largely because it can collect more data faster, and over a wider range,
- (b) clinical judgments have been shown to add little to existing tests or objective judgments, and
- (c) statistical methods of information gathering and analysis are much more cost efficient than clinical assessment procedures.

However, Korman (1968) disagrees with Dunnette quite strongly. On the basis of his review of the prediction of managerial performance by a variety of test means, and by judgmental assessments, he concludes that "there is no basis for assuming any superiority of the 'actuarial' over the 'clinical' method at this time". Korman argues that psychometric prediction is more highly criterion oriented than judgmental assessment. In the case of the latter process, he feels that the judgmental predictors change the meaning of the criterion they are predicting and thus focus more on general levels of adequacy. This, of course, would be appropriate given the complex, changing and increasingly unstructured environment of higher management. This argument is supported by the findings of Braun and Knoche (1978).

Cronbach (1960) makes the point very clearly that clinical and statistical approaches are suited

to different purposes. Each, when used in the appropriate instance, will yield more useful data than the other, and, by the same token, each used inappropriately will provide information that is either worth little, or, at best is costly beyond its value.

On the basis of the above brief discussion it appears that a statistical approach fits the purpose of this research better than either a clinical or experimental approach. The requirements that data be gathered from an operating organization under real life conditions, and that a wide sample of managers be included in order to examine the relationship of personality with other variables, point strongly to a statistical measurement approach. The point must be made that it is the purpose and context of the re-
search which determines the approach, and not vice-versa.

As a brief summary of these basic approaches to the study of personality indicates, the idiographic assumption leads to a clinical type of analysis, and is a lengthy, time-consuming exercise whose results are, by definition, difficult, if not impossible, to generalize. With few exceptions, the field of personality research bases itself on the underlying nomothetic assumption that individuals possess the same basic traits, but in differing degrees.

DEFINITION OF PERSONALITY

As mentioned at the beginning of the chapter, a problem facing the researcher investigating personality is that there is no generally accepted definition of the concept. Personality may be defined in terms of a number of different viewpoints. For instance, it may be defined in terms of the biophysical operations of the human organism (Kretschmer, 1925; Sheldon, Stevens and Tucker, 1940); it may be defined in terms of the way in which people interact with each other (Sullivan, 1953), and how they interpret and play out their roles in any given situation (Perlman, 1968); it may be defined in terms of traits or characteristics of the individual which are directly observable in his behaviour (Watson, 1930; Skinner, 1953), or in terms of traits which are inferred from his behaviour (Cattell, 1946), etc.

Pervin (1970) differentiates between five basic types of personality theories. They are:

- psychodynamic theories - e.g. Freud
- phenomenological theories - e.g. Carl Rogers
- cognitive theories - e.g. George A. Kelly
- learning/behavioural approaches - e.g. Watson, Hull, Skinner
- trait/type, factor-analytic approaches - e.g. Cattell, Guilford, Eysenck.

The first three of these theoretical groupings - psychodynamic, phenomenological and cognitive theories - may be classified as "clinical" approaches to personality. That is, they emphasize the total individual, consistency in behaviour across different situations, and the study of small numbers of subjects in great depth. They use open-ended or unstructured tests and interviews as measurement or diagnostic instruments.

The learning/behavioural approach makes the basic assumption that all behaviour is learned. Its main focus is on observable behaviour. Its measurements are made under strict laboratory conditions, and its conclusions are often based on experimental situations involving the use of animals rather than humans.

The trait/type, factor-analytic approach is based on operational definitions of concepts, systematic testing of hypotheses, and statistical measurement. Its diagnostic tools are structured, objective tests which may be applied to large numbers of subjects simultaneously. It is based on the statistical device of factor analysis, which, it is claimed, reduces the subjectivity of the measures.

As the previous discussion of measurement methods points out, research designs which involve large numbers of subjects, and where access and

time available for testing are limited, are probably best handled through some type of statistical approach.

The Issue of Trait versus Type

Much has been made of the differentiation between traits and types in personality description by Eysenck (1970). The difference between the two concepts appears to center on the degree of generality each encompasses. Eysenck provides the following definitions:

"A trait may be defined as a covariant set of behavioural acts; it thus appears as an organizing principle which is deduced from the observed generality of human behaviour."

"A type is defined as a group of correlated traits, just as a trait was defined as a group of correlated behavioural acts or tendencies."
(Eysenck, 1970)

The relationship between the two concepts is shown in Figure 3-1. As Allport (1961) argues, if empirical investigation indicates that a number of traits are manifestations of a wider "organization" of personality, and a large number of people are found to possess this "organization", then these people can be said to constitute a type. The problem that arises with types, rather than traits, however, is that even if it is maintained that people do not fit neatly into certain types, or that type merely

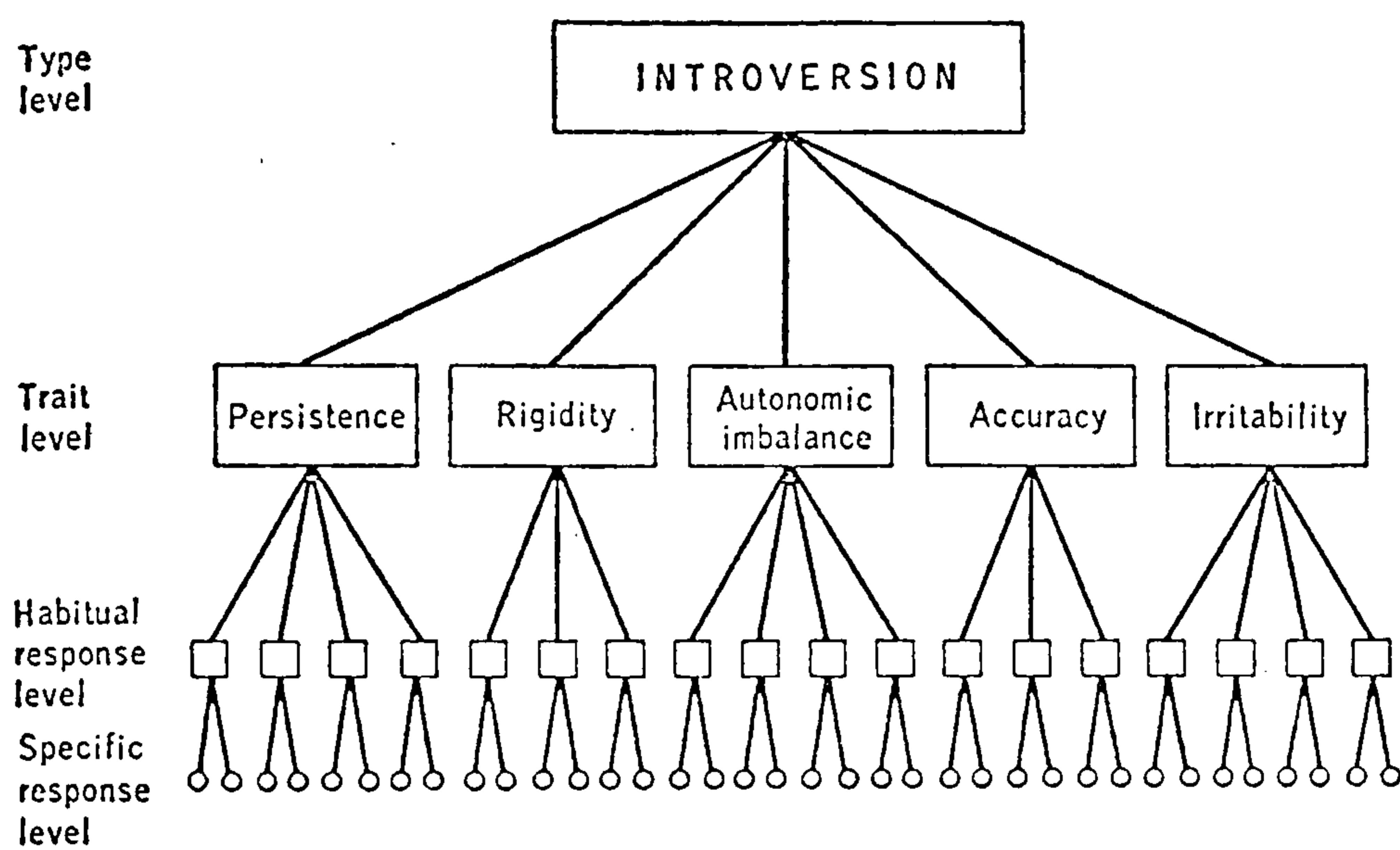


Figure 3-1. Diagrammatic representation of the relationship between type and traits.
 (Source: The Structure of Human Personality. H.J. Eysenck. London: Methuen, 1970).

denotes relative dominance of one set of characteristics, it is difficult to account for subtle differences with only a small number of categories.

As Eysenck (1970) remarks,

"The differences between the concepts of trait and type lies not in the continuity or lack of continuity of the hypothesized variable, nor in its form of distribution, but in the greater inclusiveness of the type concept."

However, generality and broad scope may not be ideal for certain types of research. There are indications that only certain aspects of personality are related to leadership effectiveness and therefore, in an exploratory study to examine these possible relationships, a broad spectrum analysis with instruments containing a relatively broad number of discrete traits would appear to make sense.

The literature as a whole is not concerned with the differentiation between trait and type. Traits appear to be more prevalent as the basis for much of the research in North America, while types appear more frequently in the British and European literature. This appears to be a function of the measurement instruments in vogue at any one time in any one place.

The question then is not which concept is correct; their interrelationship is freely acknowledged by proponents of either side. The issue is whether trait analysis or type analysis is considered most fruitful for the research at hand. There seems little doubt that the trait approach is the dominant one in personality research at the moment. Epstein (1977) has come strongly to the defense of trait measures, as has Block (1977). The major advantage of a trait approach to personality research appears to be that it allows for a wider range of more specific descriptive criteria. If it is suspected that only certain specific aspects of personality are related to a phenomenon, then there is a greater risk of blurring this relationship by using a limited number of personality types.

Definition

As Allport (1961) points out, there is no such thing as a correct or incorrect definition of personality. The concept can only be defined in ways that are useful for a given purpose (Hall & Lindzey, 1957). Pervin (1970) substantiates these points and argues that a definition of personality "generally does and should reflect the kinds of behaviour the investigator will pay attention to and the kinds of techniques he will use to study this behaviour".

Following are three definitions of personality which are consistent with the kinds of behaviour that are observed and studied in managerial populations, and with the measurement and analytical techniques that are utilized in management research. All of these definitions emphasize both

- (1) the basic consistency of personality, and
- (2) its responsiveness to situational influences.

Wright, et.al. (1970) define personality as,

"... those relatively stable and enduring aspects of the individual which distinguish him from other people and, at the same time, form the basis of our predictions concerning his future behaviour."

Operationally, this definition approaches a fit with the goals and design of the present study. It assumes stability and consistency of personality, and it refers to distinguishing characteristics which can be identified to form the basis of prediction for future behaviour.

Cattell (1967), the major current exponent of a trait approach to the study of personality, defines it as:

"... that which tells what a man will do when placed in a given situation. This statement can be formulated: $R = f(S.P.)$, which says that R , the nature and magnitude of a person's behavioural response, i.e., what he says, thinks, or does, is some function of the S , the stimulus situation

in which he is placed and of the P, the nature of his personality."

This definition specifically brings in the concept of situation or environment as an interacting variable with personality. While the personality itself may show basic consistency, Cattell argues for its responsiveness to situational influences.

Eysenck (1970) gives the following definition:

"Personality is the more or less stable and enduring organization of a person's character, temperament, intellect, and physique, which determine his unique adjustment to the environment."

Once again, both stability and responsiveness to situational influences are stressed.

The definition we will use for purposes of this research is Eysenck's. It defines personality as being relatively stable, yet able to change as it interacts with environmental stimuli. Interestingly, Eysenck's definition is close to Allport's (1937).

"Personality is the dynamic organization within an individual of those psychophysical systems that determine his unique adjustments to his environment".

While the two would argue about the degree of changeability inherent in personality, both see the concept as integrating their values, attitudes, needs, expectations and abilities to cope with their environments, and to give their lives meaning.

It is an underlying hypothesis, or assumption, of this research that managerial success is a product of a blend of somewhat fixed cognitive abilities, relatively stable and consistent personality characteristics, and more flexible and adaptive leader behaviour patterns, in interaction with specific sets of environmental conditions. Personality forms the base for successful behaviour, within situational bounds, while leadership style allows for some of the day-to-day flexibility required to handle different incidents and interactions. Therefore, we have adopted a view of personality that emphasizes relative stability, but not rigidity. The traits examined are assumed to be of a "more or less stable and enduring" character.

ASSESSING PERSONALITY

Although personality assessment has been carried out informally as long as recorded history can report, formal, quantitative study of the structure of personality and its measurement has only taken place within the last sixty to seventy years. Thirty years ago the field was well developed, as reported by Vernon (1953) in his landmark work providing a comprehensive summary of methods of personality assessment. The work in the area has continued unabated, as Jackson and Paunonen (1980) observe.

Vernon (1953) listed a number of methods, or approaches, to the assessment of personality, including the use of interviews, inferences from physical characteristics, non-verbal behaviour as a manifestation of personality, behaviour and cognitive tests, testing based on observation of actual behaviour, self-ratings and personality questionnaires, and projective techniques. All of these approaches, with the possible exception of physical types analysis (Kretschmer, 1925), are still being pursued.

As this variety of approaches indicates, the literature on personality assessment is tremendous, and it is far beyond the scope of this study to attempt to summarize it in any form. From earlier comments on the measurement of personality and the brief discussion of the strengths and weaknesses of clinical, experimental and statistical approaches, and the convergence on a definition of personality congruent with trait analysis, it can be seen that the main area of interest, in terms of personality assessment, as far as this research is concerned, centres on multi-scale objective testing. The emphasis on this method of assessment is based on the following strengths and characteristics of the approach.

- (1) It provides quantitative measures of personality variables.

While there are arguments as to whether

the scores generated by self-rated personality inventories are nominal or interval in character (Siegel, 1956), statistical methodology and computer technology have combined to make quantitative analysis of test results more meaningful.

- (2) It makes the management of large numbers of subjects and variables possible.

In order to make results more amenable to statistical analysis, very small samples need to be avoided, but once larger samples are employed, clinical methods become awkward and unmanageable.

- (3) It allows for standardization of scores on a number of variables, and therefore facilitates statistical analysis.
- (4) It permits research to be conducted in a "life" setting, as opposed to an experimental setting.

This study is an empirical examination of personality, behaviour, and performance of managers in an actual organizational setting. As a result, there are problems of access (managers are often unwilling to devote a lot of time to "research"), and of opportunity cost (the organization

wants a payoff that they perceive as clear and quantifiable, from the findings), among other things. Batteries of pencil-and-paper tests are relatively commonplace in organizational life, and it is often easier to persuade managers to take part in research in which data is gathered by these means than by more esoteric or time consuming methods.

- (5) It minimizes the effects of researcher bias during the data collection phase. Of course, bias is introduced by the choice of instruments and other factors, but in the actual data collection phase, the researcher is able to apply strict protocols that standardize the testing process and procedure.
- (6) It allows the researcher a wide selection of testing instruments, as illustrated by the length of listings in Buros' handbooks.
- (7) There is a more than adequate basis for the use of self-report instruments in the literature.

Test Construction

A further issue in the discussion of multi-scale personality tests is that of test construction. There

are several different bases for test design, each of which have different associated problems. Essentially, self-report tests are constructed on the basis of either a rational construct, empirical-criterion, or factor analytic approach (Edwards, 1959). A description of each of these methodologies will illustrate some of the factors on which test choice may be based.

In the rational-construct approach, the psychologist begins with a definition of a construct, and then elaborates on it in terms of various behaviours associated with it. For instance, the construct of anxiety might lead one to expect that subjects feeling anxiety would report being worried, tense, jittery, etc., and might exhibit certain physical behaviours. A test designed on the rational-construct principle would then question whether these feelings were being experienced by the subjects. Questions selected for the test would be those which appeared to fit the definition of the construct.

The problems associated with this type of construction, as Eysenck (1958) points out are:

- the subject may not know the truth about himself, and therefore may not be able to give a correct answer;
- it is based on the assumption that the subject will give an objectively true answer.

This may be impossible to such questions as "Do you frequently have headaches?", since the respondent may not be able to define what "frequently" means;

- responses may be faked for one reason or another.

The second approach to test design is what is termed the empirical-criterion approach which starts off without any underlying theory and relies purely on empirical procedures to select test items. The psychologist selects two populations who differ in some known respect and administers a set of test questions to all of them. Those questions in which certain responses correlate highly with one or the other of the known differences are taken to indicate the presence of that characteristic. As Eysenck (1958) says,

"We are now concerned, not at all with the interpretation of answers, but merely with the objective fact that a person puts a mark in one part of the paper rather than in another. ... Let us take the question 'Do you suffer from sleeplessness?'. It has been found that 32 per cent of neurotics answer this question in the affirmative, whereas only 13 per cent of normals answer it in the affirmative. Now, this is an objective fact."

An example of a test based on the empirical-criterion approach is the Minnesota Multiphasic Personality

Inventory - MMPI (Hathaway and McKinley, 1943).

The third approach, based on factor analysis, may begin with either items based on some theory, or may use a subject population about which some things are known; however, neither basis is necessary. The designer begins with a large assortment of test items which are administered to a large number of subjects. The items may or may not have been selected with some theoretical justification, or face validity. By pairing all items with one another, a correlation matrix is generated, and the relationship of every pair is determined by its correlation coefficient. The researcher is concerned with finding out which items subjects respond to in a similar way (i.e. which form a cluster on the basis of their intercorrelations). When strong relationships are found between responses on a group of items, a "factor" is identified. The basis of factor analysis is to discover clusters of items that are highly related to one another and only related slightly or not at all to other items outside the cluster.

The advantages of a factor-analytically based approach to test design centre around its objectivity in terms of allowing the correlation coefficients to determine factors, the rigor of the method, and its parsimony. There can be little argument about the parsimony introduced by factor analysis. Allport and

Odbert (1936) reported collecting some 18,000 words "designating distinctive forms of personal behaviour", i.e. traits. Cattell (1967) delights in the anecdote that psychologists, faced with this overwhelming number of trait words were, prior to factor-analysis, ready to set up a commission which would decide which traits were important and how they should be defined. Certainly, factor analysis has been able to reduce the number of variables required to describe and assess personality. Likewise, there is little argument that the technique is rigorous and well developed. The objectivity of factor analysis can be questioned, however. While the correlations occur wherever the data allow, there is a degree of subjectivity in deciding which clusters constitute a factor, and in the naming of the factors. Allport (1961) has commented on this difficulty, and studies comparing different factor-analytically based tests indicate that there is far from one-to-one overlap of the factors identified (Eysenck & Eysenck, 1969; Borgatta, 1962).

The major criticism levelled at factor-analytically based instruments is whether the factors have any psychological meaning (Eysenck, 1970). As he points out, appropriate data, purposefully collected to test a specific hypothesis will tend to result in fairly clearcut factors, but randomly collected data,

without a specific hypothesis as a baseline, is likely to result in factors that have no psychological meaning.

A second criticism concerns the amount of faith that can be put into the meaning and interpretation of a factor. Mischel (1968) has argued that the factors observed are often simply reflections of the social stereotypes and constructs of the analyst. Certainly one of the largest elements of subjectivity associated with factor analysis is concerned with the "naming" or interpretation of factors. Cattell (Cattell, Eber and Tatsuoka, 1970) has used trait labels which he hopes will avoid confusion over their meanings, but there are still shadings in his factors, and their interpretation has been thrown into sharp question by Eysenck and Eysenck (1969).

Two further criticisms centre on the assumptions behind factor analysis that (a) there is a linear relationship among the variables considered, and (b) that the factors combine additively rather than in some more complex fashion. In response to these criticisms, it has been argued that real curvilinear relationships among variables are rare, and that the additive model is adequate for prediction (Pervin, 1970; Cattell, 1959). These responses reflect the idea that the results of factor analysis as a technique are presently adequate, but that further developments would refine and improve the process.

Reliability and Validity

A discussion, however brief, of personality and assessment would not be complete without some mention of the concepts of reliability and validity and their applicability to test construction and test use. The American Psychological Association has produced a set of standards for psychological tests (1974) which include three types of reliability measures and three types of validity concepts, each of which will be summarized below.

Reliability refers to the consistency or stability of the measurements in question. A test is reliable if it measures something consistently and precisely. The three basic reliability measures, or coefficients, recognized by the APA are: (a) coefficient of stability, (b) coefficient of equivalence, and (c) coefficient of internal consistency.

The coefficient of stability is associated with the process of test-retest reliability measurement. In essence, the same measurement instrument is administered to the same sample of people at two different points in time, with the scores of the two administrations being correlated. The basic question being addressed is whether the instrument provides the same measures, or similar measures each time it is administered. Reliability coefficients of between .70 and

.90 are found in the best psychological tests, but some achievement tests show correlations of as low as .30 to .60 (Kelly, 1967).

The coefficient of equivalence is a measure of similarity of scores between two variations of the same instrument. The test is often referred to as either the equivalent forms, or the alternate forms test. If an instrument exists in two or more equivalent forms, then the problem of learning, or memory, affecting scores on a test-retest basis is overcome. Instruments with equivalent forms are most useful where before-and-after treatment testing is required and where the treatment may be of relatively short duration, as in some experimental studies.

The coefficient of internal consistency is a measure of whether various parts or items of a test measure the same thing. A method for measuring this is split-half testing whereby scores on one half the items of a test are compared with scores of the other half. By correcting statistically for difference in the number of items in the split-halves and the total test, an estimate is provided of the reliability of the full test. A second method involves an analysis of variance which estimates the average of the correlations between and among items on the test.

Validity refers to the degree to which a test

measures what it purports to measure. Guion (1975) defines validity as being "concerned with how relevant test scores are to something else". The "something else" is the criterion measure, i.e. what the test purports to measure. In fact, validity is more complex than this, and can be discussed under three major headings: (a) criterion-related validity, (b) construct validity, and (c) content validity.

Criterion-related validity refers to the relationship between test scores and some specified independent criterion. This relationship can either be of a predictive nature or can involve concurrent validation. In the former case, test scores are correlated with the criterion measure taken at some future date (e.g. personality scores as predictors of future success), while in the latter, the relationship between test scores and criterion measures are computed simultaneously to provide information as to whether the test does indeed measure what it purports to.

A second, and more complex type of validity measure is construct validity. Its relevance depends on how the designer or tester defines a construct, or whether, in fact, they agree to the notion that such assumed attributes of people underlie their overt behaviour (Cronbach & Meehl, 1955). Construct validity refers to the degree to which a test measures

the construct it is purported to measure. Campbell (1976) has raised some arguments about the concept of construct validity, and the debate resembles that concerning whether or not there are such things as personality traits.

The third type of validity, content validity, refers to the degree to which the items in a test represent what the test is purported to measure. There has been some debate over this concept as well, with the argument being put forward that in reality what is being done when samples of a test are judged as being representative of the total test, is concerned with test construction (Tenopyr, 1977; Guion, 1978). That a test can be "validated" by comparing parts of it with the whole is far from the concept of validity being concerned with relationship of scores to a criterion. The debate on reliability and validity concepts and measures continues, as evidenced by a six-page discussion in Jackson and Paunonen's (1980) article in the Annual Review of Psychology.

Conclusion

In summary, it appears as though the field of personality research and theory-building is alive and well, and still growing in a somewhat Topsy-like fashion. This presents a problem to the researcher

who wishes to explore the effects of personality variables on certain phenomena, since there is a wide choice of theoretical bases, tests, and assessment methods. Selection of theory, approach, and assessment method is based on the objectives of the study in question. In the case of the present research, the size of the sample, the limited access, the relative cost factors, and the basic direction of much of the literature in the field, have all pointed towards an actuarial approach to testing, using instruments validated in similar types of research. Given that the research is breaking new ground in the area of situational moderators, replication in one form or other is also an important issue. The use of standardized tests allows for easy replication, either partially or completely. Designs to test the hypotheses may vary one set of measures while maintaining the others constant, or may add or delete certain measures in the attempt to improve the level of prediction.

Personality appears to be a variable that affects success in organizations, particularly as managers attain higher levels. The research points towards cognitive abilities forming a floor on which management success is based, but not differentiating between success or lack of it after a certain level has been reached. Leadership style appears to be related

relatively strongly to situational factors, and would appear to become more important as functional specialties begin to dominate managerial jobs. Personality forms a stable, general base for behaviour and appears to correlate with success at more senior levels of the organizational hierarchy.

CHAPTER FOUR

THE RESEARCH: DESIGN AND MEASUREMENT

Over the years there have been a number of research studies which have attempted to predict managerial success by psychometric means. Much of this research has been summarized in Chapter One. The results of the studies to date have been discouraging; few clear factors have evidenced themselves as powerful overall predictors of managerial success. With the exception of the Standard Oil of New Jersey, and the Sears, Roebuck studies, predictive validities have been low, averaging between .20 and .30. In spite of this, however, Campbell et: al. (1970) reported that 40% of the companies they surveyed in an attempt to discover current practices in the field of management selection, promotion, and development, tested individuals as part of their assessment for promotion or transfer.

A number of arguments have been put forward as to why psychometric testing has not been able to predict managerial success at a higher level.

Discussion has centred on the appropriateness of the measurement instruments, (Ghiselli, 1973), the selection of criterion measures (Smith, 1976), the lack of a clear conception of the behaviours being assessed (Korman, 1968; Guion & Gottier, 1965), and the lack of a more specific, situational perspective (Dunnette, 1967, 1971). It would seem that much of the problem arises from the lack of specificity and focus of the research. Goals have been unclear, and studies have generally attempted to match wide-ranging measures of individual differences with global success criteria. Situational differences have not been examined as a means of narrowing the focus of research. Dunnette (1967) has commented, however, that,

"... better validities might be obtained by considering functions and levels separately if and when N 's are large enough to warrant doing so."

He goes on to remark that,

"No systematic studies that I am aware of have been made of the differential patterns of predictability and success dimensionality for different kinds of executive jobs."

This statement is as valid today as it was fourteen years ago, and it was on this basis that the present research was engaged.

Design of the Research

Given the current state of the research in the field, and the lack of any studies which have attempted to predict managerial success on the basis of specific job functions, the overall design of this present study was conceived,

- (a) to be predictive -- i.e. to measure independent and dependent variables separately, and at different times, with no feedback to the system of the scores of the predictor variables prior to assessment of the criterion measure,
- (b) as a corollary of (a), to be longitudinal, allowing three years between the time of the individual testing and the criterion assessment.
- (c) to be based purely on psychometric testing, because of the difficulties inherent in clinical assessment, such as contamination of the criterion variable, reliability, and because of an underlying goal to test the contention of Mischel (1973) and Dunnette (1967, 1971) that actuarial methods are

appropriate for predicting performance and

- (d) to be situational, particularly with regard to the differentiation between managerial functions.

Discussions with a number of companies resulted in the U.K. division of a large multi-national corporation agreeing to allow a research project fitting these criteria to be conducted with a group of its middle managers.

This study took place in a single large British company engaged in the manufacture and marketing of an industrial machine product. The sample consisted of 152 middle managers in a variety of functions and positions. Average tenure for the managers in the sample was in excess of seven years, average age was 34, and all subjects were male. Participation in the research was voluntary. All managers whose level and position were considered appropriate were invited to participate and were assured that the information would be held confidential. The covering letter stated,

"You are invited to participate in a testing programme which has been designed to establish managerial potential on an objective basis in addition to the normal methods of performance appraisal and rating." (Company document)

A number of testing locations were set up around the country, and strict protocols were established for

the administration of the test instruments. These protocols are shown in Appendix A. To ensure confidentiality, all subjects were assigned code numbers, and the corresponding list of names was held by one individual in the personnel department in a locked file. Contrary to the assertion in the test protocol that the results would be used in conjunction with normal assessment ratings to determine promotion, the data was not referred to by the company, and was instead turned over to this researcher on the understanding that,

- (a) all data would be kept confidential, including anything that could help to identify the company,
- (b) that the researcher would present a summary of findings to the company, and make a copy of the associated dissertation available to them, and
- (c) that any subsequent allied research be made available to the company.

The original sample contained managers from a variety of functions. However, some of the data was incomplete, some of the jobs represented very small N's, and, when the record of promotions was reviewed three years later, one functional grouping was dropped because there had been no change in the status of any of the

individuals involved. The final sample of 74 managers consisted of 51 Service Managers and 23 Operations Managers.

The Service Manager's job entailed the management of eight to ten service engineers and some 400 to 500 machines in the field. The servicing procedure was clearly laid out, with a series of technical manuals, and operational guidelines. The Service Manager was responsible for the work hours of his engineers, their response rate to customer calls, costs of parts and time, and general work load. His job entailed a reasonably large amount of statistical analysis and reporting.

The Operations Manager's job encompassed delivery scheduling, load planning, and overall coordination between sales and service. His job also involved overseeing the branch reporting system and ensuring that various segments of the information reports were completed appropriately and on time. The job involved the management of unpredictable crises, often in the form of coordinating the efforts of sales and service to meet client needs, or mediating disputes between the two functions. Both Service and Operations Managers were responsible to a Branch Manager.

Choice of Measurement Instruments

The choice of predictor instruments was based on the following criteria: they should (a) be standardized

tests, (b) have been used in similar types of managerial research, (c) have demonstrated reasonable validities, (d) fit the culture in which they were used, and (e) be short enough to combine in a battery of tests taking less than four hours to administer, and to be simply scored. The tests chosen were the AH5 Group Test of High Level Intelligence, and the Watson-Glaser Critical Thinking Appraisal (cognitive abilities), the Guilford-Zimmerman Temperament Survey (personality), and the Leadership Opinion Questionnaire (self-perceived leadership style).

Cognitive abilities have been measured by a wide variety of tests. Most of the research into the prediction of managerial success has been American, and therefore the tests used have been American in origin. While the AH5 has not been used in this type of research before, it is a British test, and has had wide use (Buros, 1959, 1965, 1972). As a pure intelligence test, it was decided to minimize cultural difficulties and to choose one of the AH4, AH5, AH6 series. While it can be argued that the AH4, which is a lower level test might have been more appropriate, it was reasoned that managers at the levels being tested might have generally higher IQ's, and therefore the AH5 was used. The test includes equal numbers of verbal and nonverbal items, with at least four different types of problems in each

part. It takes an hour to complete, and can be hand scored.

The Watson-Glaser Critical Thinking Appraisal is composed of five subtests of Inference, Recognition of Assumptions, Deduction, Interpretation, and Evaluation of Arguments. While it has generally been used in studies concerning student groups, it has also been used in a number of industrial studies, and as a testing device in personnel selection. The test takes 50 minutes to complete. Critical Thinking is defined by the test authors as,

"A composite of attitudes, knowledge and skills ... (which) includes: (1) attitudes of inquiry that involve an ability to recognize the existence of problems and an acceptance of the general need for evidence in support of what is purported to be true; (2) knowledge of the nature of valid inferences, abstractions, and generalizations in which the weight or accuracy of different kinds of evidence are logically determined; and (3) skills in employing and applying the above attitudes and knowledge."

(Watson & Glaser, 1964)

The Watson-Glaser has been used in three predictive managerial studies (Albrecht, Glaser & Marks, 1964; Jurgensen, 1966; Smith, 1976a). Correlations with effectiveness of .48 for supervisors and administrators and .41 for top level executives have been reported.

The personality measure selected was the Guilford-Zimmerman Temperament Survey. One of the decisions to

be made in the selection of a personality inventory concerns the trait/type argument discussed in Chapter Three. The major type inventory is the Eysenck Personality Inventory, which has been used mostly in British research. The most widely used factor-analytically based personality inventory in America is Cattell's 16PF. Objections can be raised to both in that a type approach limits the number of variables available for analysis, and the 16PF has been so widely used on both sides of the Atlantic that there is some resistance to it in many organizations.

The similarity between the 16PF of Cattell, Guilford's scales, and the Eysenck Personality Inventory has been investigated by Eysenck and Eysenck (1969). They compared the three sets of questionnaires on the basis of the primary factors postulated by each, and then on the basis of whether a factor analysis of the actual items in each questionnaire would result in the primary factors hypothesized by their authors. Basically, the Guilford scales appeared to stand the test of factor analysis of individual items better than the Cattell scale. The conclusion may be drawn, therefore, that there is a greater degree of similarity in the primary factors measured by Guilford and Eysenck than by Cattell and Eysenck. On this basis the Guilford scales were chosen for this research as representing

a more reliable, middle-of-the-road measurement device than either the Cattell 16PF, at the trait level, or the Eysenck EPI, at the type level.

The Guilford-Zimmerman Survey was used in the extensive research at Standard Oil of New Jersey, with validities of .32 and .31 on special keys. A related test, the Guilford-Martin Personality Inventory, was used in the Sears, Roebuck research where eight of the factors were significant as predictors in more than five of the studies. The Guilford-Zimmerman Survey was also used in research by Harrell (1962), Jurgensen (1966), in the Western Reserve Studies by Campbell and his associates (Campbell, 1962), and by Brousseau (1976).

Probably the most contentious choice of test instruments occurs in the area of leadership style. The debate over the merits of the various tests available has been furious and cutting. Much of the argument centres on the theoretical base adopted, with followers of Fiedler defending the Least Preferred Co-worker Scale (LPC), proponents of the Ohio State researches arguing for the measurement of Initiating Structure and Consideration by either the Leadership Opinion Questionnaire (LOQ), the Supervisory Behaviour Description Questionnaire (SBDQ), or the Leader Behaviour Description Questionnaire (LBDQ), and a third measure,

the University of Michigan four-factor scale, which exists in two forms, being proposed by yet another set of researchers following the early Bowers and Seashore (1966) study.

Kerr and Schreisheim (1974) and Schreisheim and Kerr (1967) have supported the use of Consideration and Initiating Structure as constructs of leader behaviour, but have criticised the Ohio State measurement tests on the basis of weaknesses in construct validity, content validity, and concurrent validity. The criticisms of Fiedler's LPC have been much sharper, as discussed in Chapter Two, and only the staunchest of his supporters appear to stand behind the measure. The Michigan scales have not demonstrated strong reliability on a test-retest basis, and the data on their concurrent and predictive validity is questionable.

The Leadership Opinion Questionnaire was selected for use in this research because it measures a manager's perception of himself as he feels he ought to behave in his job. The other instruments (with the exception of the LPC) measure subordinate perceptions of the manager. A measure of manager self-perception is congruent with the definition of leadership style adopted in Chapter Two,

The relatively enduring pattern of response exhibited over a range of organizational settings.

The LOQ has also been widely used in leadership research, has strong reliability coefficients (.62 for Consideration, and .80 for Structure for a sample of executives), and has well developed norms for a wide variety of managerial levels and jobs.

The Focus on Job Differences: The Moderator Variable

We are concerned here with predicting managerial success. While earlier research in traditional worker and work-related areas forms the underlying basis for this study, a managerial focus implies significant departures in methodology and approach. One of the major differences, and difficulties, associated with managerial performance studies is that of defining the job of the manager. As Campbell et. al (1970) remark,

"It is difficult to describe any job and discover what it calls for in employee behaviour, but unusually so for managerial jobs because they change so much from one setting to another."

Approaches to developing descriptions of managerial jobs have taken a number of forms, all with mixed results. These different approaches are summarized, and briefly commented on, in order to underline the basic problem associated with defining (a) a manager's job, and (b) managerial effectiveness. The concept of the manager's job is not the central focus of this research, but it is important to understand the complexity of the

definitional problem in order that some of the features of the research design of this study may be placed in context.

A number of different methods have been employed in attempting to define the essential features common to all managerial jobs. These can be categorized as: methods of direct observation and behaviour recording; behaviour sampling; the critical incident methodology; factor analytic studies.

Systematic observation of managerial behaviour has been carried out by Carlson (1951), Burns (1957), Dubin and Spray (1964), Horne and Lupton (1965), Stewart (1967), Lawler, Porter and Tannenbaum (1968), and Mintzberg (1973). Most of these studies are concerned with either how managers spend their time or with communication and interaction patterns. Conclusions are that executives work hard, read and contemplate little, are constantly interrupted, spend most of their time in face-to-face discussion, and at higher levels are involved more with individuals from outside the company, and with peers, than with internal vertical communications.

The technique of behaviour sampling, where momentary observations of activity are made at randomly selected times, rather than observing and recording all behaviour over a specified time period, has been employed

by Kelly (1964), who made 1300 observations, over a three-week period, of four foremen, to determine how they spent their time. Results complement findings at higher levels in that the foremen spent most of their time (50%) with subordinates, in contrast to higher level managers who tend to spend their time with peers and outsiders.

The critical incidents technique developed by Flanagan (1954) examines reports of specific behaviour (or "incidents") where managers were either particularly effective or particularly ineffective, to attempt to determine those specific behaviours which are critical to bringing about the difference in outcomes. Flanagan (1951), Williams (1956), and Kay (1959) have examined large numbers of incidents and developed long checklists of task behaviours regarded critical to success in a job. Unfortunately, the wording of the required behaviours is imprecise and somewhat subjective in interpretation (e.g. "stimulates pride in the immediate organization and the company"; "looking out for subordinates' welfare"; "initiates necessary plans and acts promptly"), reducing the general usefulness of the findings.

Factor-analytic studies have been conducted by Creager and Harding (1958), Fleishman (1953), Forehand and Guetzkow (1962), Grant (1955), Hemphill (1959, 1960), Peres (1962), Prien (1963), Rambo (1958), Stogdill et. al.

(1956), and others. The weakness of all these studies centres on the subjectivity involved in interpretations of statements and the consequent naming of factors. A number of these studies result in either two factors or two groups of factors roughly similar to the Ohio State Leadership Studies factors of Consideration and Initiating Structure.

From the point of view of the research conducted in this study, all of the work just mentioned can be criticised as largely focussing on a generalized view of what managers do and not providing a detailed examination of the differences between managerial jobs, functions, levels, etc. The above-mentioned studies address the first of two issues raised by Mintzberg (1973), but leave the second untouched.

"There has been some discussion in the literature on whether different managerial jobs are characterized by their essential similarities or by their differences. Surely, the ultimate answer must be that there are certain essential features common to all manager's (sic) jobs, and that there are also uniquenesses that distinguish every type of managerial job."

A major hypothesis of this research is that different managerial jobs require different behaviours. While there may well be basic similarities between all managerial jobs (such as the basic purposes and working roles proposed by Mintzberg), from the point of view

of testing managers to predict their future success, the research indicates that generalized predictions of success over a range of functions, levels, jobs, and organizations are not strong.

There is a need for a more specific stance which controls for such factors as organizational level, job function, job content, and organizational environment. The question is not so much what a manager does -- it has been seen that there is little agreement as to the specifics of behaviour -- as what factors make for success in different types of jobs, at different organizational levels, and in different companies. The search for the key to effective managerial behaviour is illogical. Managerial jobs vary so greatly from one to another that the chances of there being a unique set of characteristics and behaviours that will result in high level performance in all instances are minimal.

The moderator variable in this research is job function, as defined by degree of task structure. Since all managers in the study are in either one of two separate jobs, and at the same organizational level in the same company, differences due to level and environment are controlled for.

The measurement of task structure adopted is the scale developed by Shaw (1963) and used by Hunt (1966), and Fiedler (1967). Scores for the two jobs,

Service Manager and Operations Manager, were obtained by having each of the individuals in the sample complete the Shaw scale, rating their jobs, as they saw them, on goal clarity, goal path multiplicity, decision verifiability, and solution specificity. Sum scores were averaged to reach an overall rating for the two types of jobs (Service 10.3, and Operations 13.6).

There has been a fairly wide acceptance of, and investigation into, the relationship between task variables and leadership style. Much of the research in this area has been done in laboratory settings examining the workings of small-groups.

These studies were sparked off by hypotheses put forward by theorists on both sides of the Atlantic, Rice (1963) suggested that in an organization, subsystems which have different tasks also tend to show differences in "leader-follower patterns". Lorsch (1965) put forward a more specific hypothesis:

"In a highly structured unit, other things being equal, there would generally be more directive interpersonal norms than in a less highly structured unit."

Managerial jobs vary widely in terms of such things as the degree to which decisions are structured or unstructured, or how long a period elapses between goals being set and performance being reviewed (Jaques, 1956).

The differences in managerial job functions are not well measured using the tools of the organizational technology researchers. Hickson's (1969) scales of workflow rigidity, automaticity mode, automaticity range, interdependence of work-flow segments, and specificity of criteria of quality evaluation, which can be summed to form a "workflow integration" scale, fits an organizational analysis better than an individually-oriented one. Woodward's (1965) 10-point scale of technical complexity, which focusses on the degree of controllability and predictability of the production process, is restricted to the manufacturing industry, and is clearly concerned with an organizational rather than a managerial variable.

Task structure has been used by theorists such as Hunt (1966), Fiedler (1967), Reddin (1970), and House and Mitchell (1974) to differentiate between types of jobs, and to link leadership style to job demands. While it is far from the only method of differentiating jobs, it does have some basis in the leadership research, and represents a relatively easy method for organizations to view classes of jobs.

The Research Data

The research data consists of 16 scores on the four predictor measures:

Cognitive Abilities:

AH5 - Verbal

Diagrammatic

Sum score

Watson-Glaser - Sum score

Leadership style:

LOQ - Consideration

Initiating Structure

Personality:

Guilford-Zimmerman - 10 factors

- (G) General activity
- (R) Restraint
- (A) Ascendance
- (S) Sociability
- (E) Emotional stability
- (O) Objectivity
- (F) Friendliness
- (T) Thoughtfulness
- (P) Personal relations
- (M) Masculinity

There is one score on the task structure continuum for the moderator variable, leading to a differentiation between two job functions, Service Managers (10.3 on Shaw scale), and Operations Managers (13.6 on Shaw scale), and a single success criterion, promotion, which produces two status categories:

Successful Managers (promoted within three years),

Unsuccessful Managers (not promoted within three years),

These data are summarized statistically in Exhibit B.

CHAPTER 5

RESULTS AND ANALYSIS

Using job type as an intervening variable, this research attempts to predict managerial success on the basis of psychometric ratings of cognitive abilities, personality, and self-perceived leadership style. What differentiates this study from others done in the past is the use of job type as a situational variable, examining the prediction of success within two separate jobs, varying by degree of task structure. The data is organized by job function (Service managers and Operations managers), and by status (Successful and Unsuccessful). The job as a Service manager is relatively structured, scoring 10.3 on the Shaw scale, while the job of an Operations manager is relatively unstructured, being scored 13.6 on the Shaw scale. Success for an individual in the sample is defined as having been promoted within three years after the data were collected, while being Unsuccessful implies either having stayed in the same job or moved, but not having been promoted. A summary of the data is presented in Figure 5-1.

		<u>JOB FUNCTION</u>	
		Service Managers (N = 51) (Structured: Shaw Scale 10.3)	Operations Managers (N = 23) (Unstructured: Shaw Scale 13.6)
<u>STATUS</u>	Successful (N = 16)	(A) (n = 10)	(C) (n = 6)
	Unsuccessful (N = 58)	(B) (n = 41)	(D) (n = 17)

Figure 5-1. The total sample of managers (N = 74) broken down by Job Function (Service managers and Operations managers), and by Status (promoted or not promoted three years after being tested).

Hypotheses

The hypotheses are:

- (1) That there are significant differences in cognitive abilities, personality characteristics, and self-perceived leadership style between Successful and Unsuccessful managers within specific job function (i.e. between Successful Service managers and Unsuccessful Service managers -- quadrants (A) and (B) -- and between Successful Operations managers and Unsuccessful Operations managers -- quadrants (C) and (D)).
- (2) That there are significant differences in cognitive abilities, personality characteristics, and self-perceived leadership style between Successful managers in different job functions (i.e. between Successful Service managers and Successful Operations Managers -- quadrants (A) and (C)).
- (3) That there are no significant differences in cognitive abilities, personality characteristics, and self-perceived leadership style between Unsuccessful managers in different

job functions (i.e. between Unsuccessful managers and Unsuccessful Operations managers -- quadrants (B) and (D)).

- (4) That the level of prediction of Status within specific job functions will be higher than the level of prediction of Status for the sample as a whole.

Results

The data were subjected to a series of statistical treatments to test the hypotheses. To begin with, the variance in each of the sixteen predictor variables accounted for by job function and by status was measured using two-way analysis of variance. Then the differences predicted in the first three hypotheses were tested by a t-test analysis of differences of subsample means. And finally, the data was subjected to discriminant function analysis, using two different procedures, to discover which variables discriminated between success and the lack of it. Predictions of the status of all individuals in the sample were then made on the basis of the discriminant coefficients.

Hypothesis 1

Analysis of Variance. Two-way analysis of variance allows one to examine the simultaneous effects of two or more factors on a dependent variable. In the

case of this research, we are interested in the relationships between measures of cognitive abilities, personality characteristics and self-perceived leadership styles, and differences in job function and status. The results of a two-way analysis of variance of each of the sixteen predictor variables by job function and status are summarized in Appendix D.

Variance due to Status. Testing the null hypothesis of no differences in variance due to Status, values of F significant at the .05 level or better were found for the LOQ factor of Initiating Structure, and for the Guilford-Zimmerman personality factors G (General Activity), A (Ascendance), E (Emotional Stability), and F (Friendliness). These findings are summarized in Table 5-1.

<u>Variable</u>	<u>F value</u>	<u>Significance of F</u>	<u>Direction</u>
LOQ Structure	7.882	.006	+ Succ.
(G) General Activity	4.419	.039	+ Succ.
(A) Ascendance	7.313	.009	+ Succ.
(E) Emotional Stability	3.929	.051	+ Succ.
(F) Friendliness	4.992	.029	- Unsuc.

Table 5-1. Significant differences in variance in five predictor variables due to Status (Successful vs. Unsuccessful) (N = 74)

The right hand column in Table 5-1 indicates the directionality of the predictor variables. For instance, Successful managers are shown to score significantly higher on Initiating Structure than Unsuccessful managers. The figures indicate that there are significant differences between Successful and Unsuccessful managers on five dimensions -- one of leadership style, and four of personality characteristics. No significant differences in variance were found for any of the scores of cognitive abilities. Definitions and interpretations of the predictor variables and of Shaw's scale are presented in Appendix G.

These results indicate that for the sample being considered, Successful managers perceive themselves as being more structuring and directive in their leadership style, and as being more energetic and enthusiastic more persuasive and conspicuous, more composed and optimistic, than Unsuccessful managers. Unsuccessful managers tend to be more submissive. These results are similar to those obtained in the Sears, Roebuck research (Bentz, 1967), which identified significant positive differences for Successful managers against Unsuccessful managers for the Guilford-Martin factors (G) and (A), which are comparable to the corresponding Guilford-Zimmerman factors (G) and (A).

It should be noted that the significance for the

LOQ score on Consideration failed the confidence test at the .05 level, but it did show significance at .059. There is an indication, therefore, that not only do Successful managers tend to perceive themselves as exhibiting more structuring behaviour, but Unsuccessful managers tend to see themselves as being more considerate and subordinate-oriented. Overall, success in this company is related to a more directive style of management, while considerate behaviour is perceived by the company as being less effective.

Differences in Means. Results of t-tests of differences in means between each of the subsamples shown in the four quadrants in Figure 5-1, by Job Function and by Status, are shown in Appendix C. Examining the data pertinent to hypothesis 1 (Appendix C, Tables C-1 and C-2), there are significant differences in means between Successful and Unsuccessful Service managers for seven of the predictor variables. These variables are, Initiating Structure, G (General Activity), A (Ascendance), S (Sociability), E (Emotional Stability), F (Friendliness), and M (Masculinity). These data are summarized in Table 5-2.

What the figures in Table 5-2 indicate is that Successful Service managers tend to see themselves as more directive and structuring in their style of management, and that they tend to be more energetic and

<u>Variable</u>	<u>T-value</u>	<u>2-tail Probability</u>
IOQ Structure	- 3.23	.002
(G) General Activity	- 2.65	.011
(A) Ascendance	+ 2.63	.011
(S) Sociability	+ 2.51	.015
(E) Emotional Stability	+ 2.28	.030
(F) Friendliness	- 3.26	.003
(M) Masculinity	+ 2.54	.014

Table 5-2. Significant differences in means between Successful and Unsuccessful Service Managers for seven predictor variables. (N = 51)

enthusiastic, more persuasive and conspicuous, more outgoing, more composed and optimistic, more belligerent and dominant, and more hardboiled than Unsuccessful Service managers. On the other hand, as the data in Appendix C, Table C-2 indicate, Operations managers showed no significant differences in means on any of the sixteen predictor variables for Status.

These findings of differences within specific job function both support the results of the analysis of variance for the total sample of managers, and also argue for the prediction of success by job function. Successful Service managers exhibit a number of the characteristics of Successful managers in the company in general. They score higher in Initiating Structure,

and on the Guilford-Zimmerman factors G, A, and E, and lower on factor F. But the fact that there are no differences for Operating managers indicates that the criteria for success are in some manner different for Operations managers than for Service managers.

Discriminant Function Analysis. Discriminant function analysis takes a set of pre-selected hypothesized discriminating variables that measure characteristics thought to differentiate two or more groups, and weights and linearly combines them in such a fashion that the groups are forced to be as statistically distinct as possible. It then identifies the characteristics which contribute most to the differentiation between groups, and once such a set of variables is discovered, a set of classification functions are generated which permit the classification of new cases, or the testing of the classification of existing cases.

Summary statistics for both stepwise and direct method discriminant analyses of data are found in Appendix E. The data pertinent to hypothesis 1 are summarized in Tables E-1 and E-2, and Tables E-3 and E-4 in that appendix.

In many cases where there is a large number of possible discriminating variables, the full set of variables may contain excess information about group differences, or there may be certain variables which

do not contribute to the discrimination. In these cases, it is useful to use a stepwise procedure, selecting variables one at a time on the basis of the amount of discriminating power they possess. A stepwise discriminant analysis of the sixteen predictor variables, by status, within job function, resulted in the following lists of discriminating factors for Service managers and Operations managers (Table 5-3).

<u>Discriminating Variables, Status</u>	
<u>Service Managers</u>	<u>Operations Managers</u>
LOQ Structure	LOQ Structure
AH51 Verbal-Numeric Intelligence	(R) Restraint
(T) Thoughtfulness	(S) Sociability
(F) Friendliness	(A) Ascendance
(P) Personal Relations	(E) Emotional Stability
(M) Masculinity	(O) Objectivity
Signif. of Discrim. Function	Signif. of Discrim. Function
.0004	.0722

Table 5-3. Discriminating variables for Service Managers and Operations Managers, by Status, (stepwise discriminant analysis).

If the standardized canonical discriminant function coefficients of the variables in Table 5-2 are considered (Appendix E, Tables E-1, E-2), their contribution towards Success or lack of it can be

assessed.

Successful Service managers perceived themselves as having a more directive, structured management style, and they tend to be more tolerant, intelligent, and hardboiled than Unsuccessful Service managers. The latter tend to be more reflective and philosophical, and more submissive. Successful Operations managers also perceive themselves as having a more structured and directive management style, and they tend to be more persuasive and conspicuous, and more composed and optimistic than their Unsuccessful counterparts. The Unsuccessful Operations Managers tend to be more serious and persistent, more outgoing, and more insensitive.

When the data are examined using a direct method of discriminant analysis (all variables), the results are similar. The same major factors show up as discriminators, but a number of other variables also show low predictive ability, accounting individually for very small amounts of variance. Summary statistics for the direct method discriminant analyses by Status are found in Appendix E, Tables E-3 and E-4.

While the factors listed in Table 5-3 have been identified as the major discriminating variables, they do not present a complete picture of the differences between the relevant groups. The stepwise procedure is designed in such a way as to ensure that almost any

variable with discriminatory power is included in the analysis, but, given a large number of predictor variables that fail to reach the cut-off value, there is a possibility of an additive effect taking place that a host of singly inconsequential variables may group together to increase the discriminatory power of the function. This is demonstrated by a comparison of the canonical correlations for the discriminant functions derived from a stepwise procedure and from a direct method including all the variables (Table 5-4).

<u>Canonical Correlations</u>	<u>Service Managers</u>	<u>Operations Managers</u>
(a) stepwise method	.6419590	.6886838
(b) all variables	.7062738	.7581494

Table 5-4. Comparison of canonical correlations for discriminant functions derived for Service Managers and Operations Managers, by Status, by stepwise and direct (all variable) processes.

While the discriminant analyses of Service managers and Operations managers, by Status, regardless of the specific method of calculation, identify the same basic discriminating variables, the figures in Table 5-4 indicate that there is a fairly large increase in the proportion of variance in the discriminant functions explained by the groups when all variables are taken into account. This proportion of

variance can be calculated by squaring the canonical correlations. Thus, for Service managers, the proportion of explained variance rises from 41% to 50%, and for Operations managers, from 47% to 58%. There is clearly a process here whereby a number a predictor variables have very little unique discriminating power, but are able to combine in some fashion to become incrementally useful.

Conclusions for Hypothesis 1

The results of the three tests of difference applied to the samples of Service and Operations managers are summarized and compared in Tables 5-5 (Service managers), and 5-6 (Operations managers).

There are clear differentiating variables for Service managers. These tend to overlap the general differentiating variables for all managers in the sample to some degree, but significant differences are indicated for two separate variables in the t-test analysis, and the stepwise discriminant analysis identifies four factors that are specific to Service managers as opposed to the entire sample. The hypothesis argues that there are significant differences in cognitive abilities, personality characteristics, and self-perceived leadership styles between Successful and Unsuccessful managers within specific job functions. This appears to be the

<u>All Managers</u>	<u>Service Mgrs. only</u>	<u>Service Managers only</u>
Two-way analysis of variance	T-test	Stepwise discriminant analysis
LOQ - Structure	LOQ - Structure	LOQ - Structure
Gen. Act. (G)	Gen. Act. (G)	
Ascend. (A)	Ascend. (A)	
Emot. Stab. (E)	Emot. Stab. (E)	
Friend. (F)	Friend. (F)	Friend. (F)
	Sociab. (S)	
	Mascul. (M)	Mascul. (M)
		Thought. (T)
		Pers. Rels. (P)
		All51 - Verb. Intell.

Table 5-5. Comparison of the differentiating variables between Successful and Unsuccessful Service managers from three tests. All significant at .05 or better.

<u>All Managers</u>	<u>Operations Managers only</u>	<u>Operations Managers only</u>
Two-way analysis	T-test	Stepwise discriminant
(Sig. .05 or better)		Signif. of Disc. Function .07)
LOQ - Structure	n/a	LOQ Structure
Gen. Act. (G)	No variables significant at .05	Ascend. (A)
Ascend. (A)	or better	Emot. Stab.
Emot. Stab. (E)		Restraint (R)
Friend. (F)		Sociab. (S)
		Object. (O)

Table 5-6. Comparison of the differentiating variables between Successful and Unsuccessful Operations managers from three tests. No results within function significant at .05 level or better.

case for Service managers, but not for Operations managers. While there are some directional indications of differences between Successful and Unsuccessful Operations managers, none of the factors is statistically significant.

Finally, on the basis of the discriminant function scores and coefficients, predictions can be made as to the status of each of the individual cases. These classification results are shown in Table 5-7. The predictive level of 88.24% for Service managers, at a statistically significant level of .03 is impressive in relation to the reported predictive ability of other studies in the literature. While a high percentage is attained for Operations managers, the significance levels are inadequate, and not a great deal of faith can be placed on these discriminant functions as predictors of Success in the function.

Figures 5-2 and 5-3 are histograms of the canonical discriminant functions (all variables) showing plots of the discriminant scores for each individual Service manager and Operations manager. They illustrate the degree of discrimination between the two groups of Successfals and Unsuccessfals for each job function, and present a visual representation of the classification results in Table 5-7.

Classification Results, Service Managers, by Status (all variables)

<u>Actual Group</u>	<u># of Cases</u>	<u>Predicted Group Membership</u>	
		<u>Successful</u>	<u>Unsuccessful</u>
Successful	10	9(90.0%)	1(10.0%)
Unsuccessful	41	5(12.2%)	36(87.8%)

Percent of Grouped Cases Correctly Classified: 88.24%

(Significance of discriminant function .03)

Classification Results, Operations Managers, by Status. (all var.)

<u>Actual Group</u>	<u># of Cases</u>	<u>Predicted Group Membership</u>	
		<u>Successful</u>	<u>Unsuccessful</u>
Successful	6	5(83.3%)	1(16.7%)
Unsuccessful	17	2(11.8%)	15(88.2%)

Percent of Grouped Cases Correctly Classified: 86.96%

(Significance of discriminant function .07)

Table 5-7. Classification results for Service and Operations Managers, by Status.

ALL-GROUPS STACKED HISTOGRAM

		-- CANONICAL DISCRIMINANT FUNCTION 1 --			
4	+			1	1
.	.			1	1
.	.			1	1
.	.			1	1
3	+		1	1	1
.	.		1	1	1
.	.		1	1	1
.	.		1	1	1
2	+		112	111	111
.	.	2	1	11	1
.	.	2	1	11	1
.	.	2	1	11	1
.	.	2	1	11	1
1	+	2	1	11	1
.	.	22	2	21	1211111 1
.	.	22	2	21	1211111 1
.	.	22	2	21	1211111 1
.	.	22	2	21	1211111 1
OUT
		-3	0	1	1
		-2	0	1	1
		-1	0	1	1
		0	0	1	1
		1	0	1	1
		2	0	1	1
		3	0	1	1
		4	0	1	1
		5	0	1	1
		6	0	1	1
		7	0	1	1
		8	0	1	1
		9	0	1	1
		10	0	1	1
		11	0	1	1
		12	0	1	1
		13	0	1	1
		14	0	1	1
		15	0	1	1
		16	0	1	1
		17	0	1	1
		18	0	1	1
		19	0	1	1
		20	0	1	1
		21	0	1	1
		22	0	1	1
		23	0	1	1
		24	0	1	1
		25	0	1	1
		26	0	1	1
		27	0	1	1
		28	0	1	1
		29	0	1	1
		30	0	1	1
		31	0	1	1
		32	0	1	1
		33	0	1	1
		34	0	1	1
		35	0	1	1
		36	0	1	1
		37	0	1	1
		38	0	1	1
		39	0	1	1
		40	0	1	1
		41	0	1	1
		42	0	1	1
		43	0	1	1
		44	0	1	1
		45	0	1	1
		46	0	1	1
		47	0	1	1
		48	0	1	1
		49	0	1	1
		50	0	1	1
		51	0	1	1
		52	0	1	1
		53	0	1	1
		54	0	1	1
		55	0	1	1
		56	0	1	1
		57	0	1	1
		58	0	1	1
		59	0	1	1
		60	0	1	1
		61	0	1	1
		62	0	1	1
		63	0	1	1
		64	0	1	1
		65	0	1	1
		66	0	1	1
		67	0	1	1
		68	0	1	1
		69	0	1	1
		70	0	1	1
		71	0	1	1
		72	0	1	1
		73	0	1	1
		74	0	1	1
		75	0	1	1
		76	0	1	1
		77	0	1	1
		78	0	1	1
		79	0	1	1
		80	0	1	1
		81	0	1	1
		82	0	1	1
		83	0	1	1
		84	0	1	1
		85	0	1	1
		86	0	1	1
		87	0	1	1
		88	0	1	1
		89	0	1	1
		90	0	1	1
		91	0	1	1
		92	0	1	1
		93	0	1	1
		94	0	1	1
		95	0	1	1
		96	0	1	1
		97	0	1	1
		98	0	1	1
		99	0	1	1
		100	0	1	1

Successful
Service Managers
(2)

Unsuccessful
Service Managers
(1)

Figure 5-2. Histogram of canonical discriminant function (all variables), Service managers, by Status.

-- CANONICAL DISCRIMINANT FUNCTION 1 --

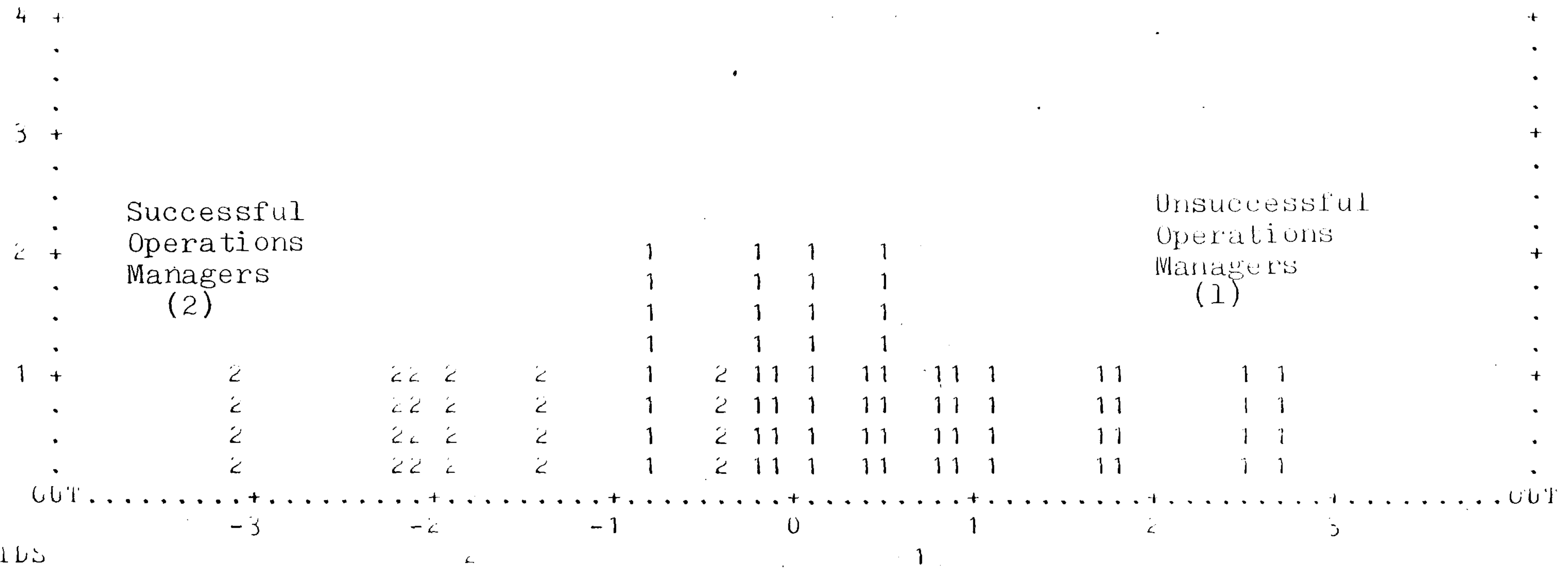


Figure 5-3. Histogram of canonical discriminant function (all variables), Operations managers, by Status.

Hypothesis 1 appears to be partially confirmed by the results. There are clear differences for Service managers, and there are indications of differences for Operations managers. The issue of whether one can predict success purely on the basis of psychometric test results, given a breakdown by specific job function is still unclear. It appears as though one can in some instances and not in others. Whether the criteria for Success overlap in the two job functions, and whether degree of task structure is an adequate means of separating job types is a matter for examination under hypothesis 2.

Hypothesis 2

Analysis of Variance. Two-way analysis of variance showed only two differentiating variables between job functions, and they were both leadership style dimensions. The measures for Consideration and Initiating Structure both showed significant values of F. Operations managers are higher in Consideration, and Service managers are higher in Initiating Structure. (These results are shown in Appendix D, table D-1.)

These findings fit the theory that managers in structured jobs need to be more directive, in order to be effective, and that managers in unstructured situations need to be more considerate, open and willing to

listen and discuss (Reddin, 1970). When there is a clear job to be done, and the methods of doing it are clear and well known to the manager, the best way of handling subordinates is to tell them what to do and make sure they get on with it. However, in unstructured situations where there is uncertainty about how to handle some problems, some degree of creativity may be required, and task and goal specificity are low, a more participative style of management would appear to be appropriate.

The findings concerning variance by job function are shown in Table 5-8. These differences are between all Service managers and all Operations managers, and are therefore general findings rather than Specific tests of difference between Successful managers by job function,

<u>Variable</u>	<u>F value</u>	<u>Signif. of F</u>	<u>Direction</u>
LOQ - Consideration	5.680	.020	+ Operations
LOQ - Structure	7.714	.007	+ Service

Table 5-8. Significant differences in variance in two predictor variables due to Job Function (Service vs. Operations).

It is interesting to note that none of the factors of cognitive ability or personality characteristics showed any significant differentiation between functions. This may be caused by the fact that the samples of

Service and Operations managers are not separated as to Status. While there might be an expected difference between Successful Service and Operations managers, in line with the hypotheses of this study, when the ineffectives are massed in with the data, their lack of distinguishing characteristics tends to blur the difference between functions. However, it appears that leadership style has already made its mark strongly on all managers by the time they reach the middle levels of their functional specialty. It may be necessary to exhibit considerate behaviour to become an Operations manager, and structured and directive behaviour to become a Service manager, but, by the same token, there may be other characteristics and qualities that are required in order to advance beyond that level.

Differences in Means. T-tests of differences in means of the sixteen predictor variables, for Successful managers, by Job Function, are shown in Appendix C, Table C-3. Once again there are only two variables that show a significant difference between the groups. Successful Service managers perceive themselves as being more structuring and directive in their management style, and they also tend to be more hardboiled and less emotional. This is the caricature of the hard-nosed, autocratic manager working in a structured environment. He "defines and structures his own role and those of his

subordinates toward goal attainment" (Fleishman, 1969). The findings certainly fit the existing theory concerning match of style to job demands, but it is not made clear how important these factors are in explaining total differences between Successful Service managers and Successful Operations managers. In other words, the question still remains as to whether one can predict success in either of these job functions with any degree of confidence, based purely on these two differentiating factors.

<u>Variable</u>	<u>t-value</u>	<u>2-tail Probability</u>
LOQ - Structure	+ 2.58	.022
(M) - Masculinity	+ 3.45	.004

Table 5-9. Significant differences in means between Successful Service managers and Successful Operations managers for predictor variables.

Discriminant Function Analysis. Two sets of discriminant analyses were completed, the first being a stepwise procedure, and the second including all variables. The results of these analyses are summarized in Appendix E, Tables E-5, and E-6.

The stepwise procedure identified three major discriminating variables of cognitive ability, personality and self-perceived leadership style, at a significance level of .005. The three variables were the

Watson-Glaser Critical Thinking Appraisal score, the Guilford-Zimmerman factor M (Masculinity), and the LOQ factor of Consideration. On the basis of these three variables, classification of Successful Service managers and Successful Operations managers could be made accurately 93.75% of the time. These factors produce a very clear discrimination between the two groups. Table 5-10 summarizes the discriminant function coefficients and the classification results obtained from a stepwise analysis.

When the entire set of variables are utilized in the discriminant analysis, the differentiation between Successful Service managers and Successful Operations managers becomes crystal clear. The classification of results is at the level of 100%, with a significance of the discriminant function of .01. The histogram of the canonical discriminant function utilizing the variables (Figure 5-4) provides a vivid picture of the separation of the two groups.

Conclusions for Hypothesis 2

Hypothesis 2 argues for significant differences in cognitive abilities, personality characteristics and self-perceived leadership style between Successful managers in different job functions. It is the basis for the situational position that different styles and characteristics are required for effectiveness in

<u>Discriminating Variable</u>	<u>Standardized Canonical Discrim. Func. Coefficients</u>
Watson-Glaser	0.60547
LOQ - Consideration	-0.70002
(M) - Masculinity	1.07550

Classification Results

<u>Actual Group</u>	<u># of Cases</u>	<u>Predicted Group Membership</u>	
		<u>Service</u>	<u>Operations</u>
Service	10	9(90.0%)	1(10.0%)
Operations	6	0(0%)	6(100.0%)

Percent of grouped cases correctly classified: 93.75%

Table 5-10. Discriminating variables, coefficients, and classification results for Successful managers, by Job Function.
(Significance of discriminant function = .0054)

different jobs. Table 5-11 summarizes the differences in predictor variables resulting from three tests. Leadership style is a consistent factor in the differentiation, and both cognitive ability and personality characteristics contribute to this discrimination.

Given the high levels of significance for the differentiating variables in each of the tests, and the ability of discriminant analysis to predict the success of 100% of the cases at a significance level of .01, it would appear that hypothesis 2 is confirmed. There are significant differences in cognitive abilities, personality characteristics, and self-perceived leadership style between Successful managers in separate job functions.

Hypothesis 3

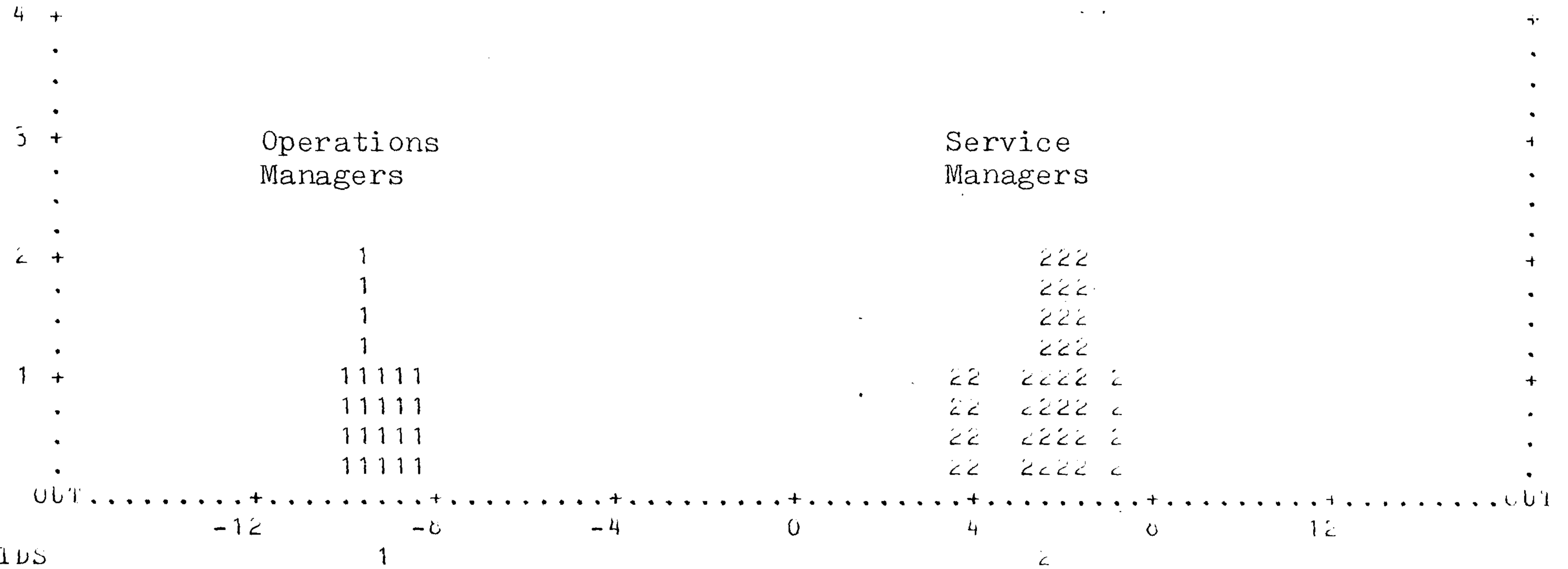
There is no specific basis for hypothesis 3 in the literature. Situational theories deal with the characteristics of effective managers rather than ineffective ones. However, since this study is largely exploratory in nature it appeared worthwhile to investigate possible differences between Unsuccessful managers in separate job functions. On the surface it would appear likely that Unsuccessful managers would show no particular characteristics across a wide sample. There are certain hypothesised characteristics which lead to Success, but lack of Success by a somewhat circular

Two-way analysis of variance (All Managers)	T-test (Successful Managers only)	Stepwise Discriminant Analysis (Successful Managers only)
LOQ - Consideration		LOQ - Consideration
LOQ - Structure	LOQ - Structure	
	(M) - Masculinity	(M) - Masculinity
		Watson-Glaser

Table 5-11. Comparison of the differentiating variables between Successful Service managers and Successful Operations managers.
All significant at .05 or better.

ALL-GROUPS STACKED HISTOGRAM

-- CANONICAL DISCRIMINANT FUNCTION 1 --



177

Figure 5-4. Histogram of canonical discriminant function (all variables), Successful managers, by Job Function.

process of reasoning, is generally seen as the result of simply not possessing any of the characteristics of Success.

If in the sample under examination, there are no significant differences between Unsuccessful Service managers and Unsuccessful Operations managers, what conclusions may be drawn? Does this imply that lack of Success is a result of not having any of the characteristics of success for any type of job? Since the sample is drawn from middle managers in a large organization, all of whom have worked there for an average of seven years, one possible interpretation of a lack of differentiating factors between Unsuccessful Service managers and Unsuccessful Operations managers is that they have all reached the same level in the organization by exhibiting similar characteristics. These characteristics are those that allow advancement to the level where these managers now find themselves. However, in order to advance to the next level of management, additional, or different characteristics may be required. Therefore one could expect a homogeneity at lower levels of management, but as functional specialty begins to take hold, special characteristics required for success may begin to manifest themselves.

Differences in Means. A t-test of differences in means for the sixteen predictor variables showed

only one variable to be significant at the .05 level. Unsuccessful Operations managers score higher in Restraint (R) than their counterparts in Service. The summary statistics are shown in Appendix C, Table C-4. The two-tailed probability for Consideration as a differentiating factor is .057, which may point in the direction of Unsuccessful Service managers perceiving themselves as more considerate and subordinate-oriented than Unsuccessful Operations managers. Given that Successful Service managers have a strongly structured leadership style, one can see that those Service managers who are more considerate are also less likely to fit the company's perception of an effective manager, and therefore are less likely to be promoted.

Discriminant Function Analysis. The picture which emerges from the discriminant analysis is one which confirms the blurring of the two groups of Unsuccessful managers. The summary statistics are included in Appendix E, Tables E-7 and E-8. An interesting finding is that the percent of grouped cases classified correctly is less when all variables are taken into account than when a stepwise procedure is utilized. Clearly, unlike the other instances we have examined where a group of singly non-discriminant factors combine in some fashion to increase the rate of prediction, in the case of Unsuccessful managers, the incremental

variables combine to reduce the discriminating power of the function. The significance of the discriminating function decreases as well when all the variables are utilized in the analysis. What this means is that the set of "best" variables selected through the stepwise procedure have in some way been made redundant. The additional variables contain some of the same information about group differences as the original set. It must be borne in mind that the discriminant equation represents a combination of all the variables within it. The addition of some variables may reduce the power of this combination if they show directions which are counter to the general predictors.

A comparison of the Wilks' Lambdas for the various canonical discriminant functions generated also indicates the relative weakness of the discrimination between Unsuccessful managers (Table 5-12).

The Lambda is considerably higher for the groups of Unsuccessful managers, i.e. the discriminating power of the function for those groups is much lower than the others.

Conclusions for Hypothesis 3

While it cannot be concluded that there are no significant differences between Unsuccessful Service managers and Unsuccessful Operations managers, the data do indicate a degree of homogeneity. The high Wilks'

<u>Discriminant Analysis of:</u>	<u>Wilks' Lambda for Disc. Function (Stepwise)</u>	(All variables)
Service managers by Status	0.58788	0.50118
Operations managers by Status	0.52571	0.42521
Successful managers by Job Function	0.36294	0.01658
Unsuccessful managers by Job Function	0.69492	0.69492

Table 5-12. Comparison of Wilks' Lambdas for eight discriminant function analyses of the sample data.

Lambdas for the discriminant functions indicate that it is much more difficult to classify Unsuccessful managers as either Service or Operations.

Hypothesis 3 is not confirmed, but there is an indication that the variables used to predict success from the lower-middle management level to the upper-middle management level are less useful as the level of the job decreases. Prior to obtaining the job as either a Service manager or an Operations manager, the individuals in this sample had little real experience with managing any significant number of people. This was, in fact, their first real test of managerial ability in the sense of supervising the activities of groups of other people. It might be argued therefore that cognitive abilities, personality characteristics and leadership styles become more important as individuals have to deal more with people than with tasks or technology. Superiors assessing management capability are likely to begin to focus on the human and interpersonal characteristics of individuals eligible for promotion rather than the technical side which has already been demonstrated earlier.

Hypothesis 4

Hypothesis 4 lies at the heart of this research in that it argues for better prediction of success when

managers are grouped by job function than when they are lumped together without regard for differences in jobs. The hypothesis itself is testable within the framework of the study, but the results are unlikely to be as clear as if the comparison were between a multi-function sample of managers and samples drawn from specific functions. Having only two functional groupings within the scope of this study limits the "global" nature of the predictions based on the entire sample. The predictions based on the entire sample, in this case only two functions, are higher than they would be if a number of different functions were represented, and therefore the difference between these predictive levels and those obtained when the sample is broken down by job function is likely to be artificially small.

Summary statistics for the discriminant function analyses, by Status, for the sample as a whole, are found in Appendix E, Tables E-9 and E-10. The classification results for the stepwise and all variables analysis are reproduced in Table 5-13.

A comparison of the prediction levels within job function and for the sample as a whole is shown in Table 5-14. The figures in brackets underneath the prediction percentages are the significance levels for the relevant discriminant functions.

Classification Results
All Successful and Unsuccessful
Managers (Stepwise)

<u>Actual Group</u>	<u># of Cases</u>	<u>Predicted Group Membership</u>	
		<u>Unsuccessful</u>	<u>Successful</u>
Unsuccessful	58	48(82.8%)	10(17.2%)
Successful	16	5(31.3%)	11(68.8%)

Percent of Grouped Cases Correctly Classified: 79.73%

Classification Results
All Successful and Unsuccessful
Managers (All variables)

<u>Actual Group</u>	<u># of Cases</u>	<u>Predicted Group Membership</u>	
		<u>Unsuccessful</u>	<u>Successful</u>
Unsuccessful	58	52(89.7%)	6(10.3%)
Successful	16	5(31.3%)	11(68.8%)

Percent of Grouped Cases Correctly Classified: 85.14%

Table 5-13. Classification results for Discriminant Analyses (All variables and Stepwise) of All Managers, by Status.
N = 74.

	<u>By Job Function</u>		<u>Entire Sample</u>
	<u>Service Mgrs.</u>	<u>Operations Mgrs.</u>	
Stepwise	82.35% (.0004)	86.96% (.0733)	79.73% (.0009)
All Variables	88.24% (.0289)	86.96% (.7131)	85.14% (.0460)

Table 5-14. Comparison of prediction percentages resulting from discriminant analyses within job function, and for the sample as a whole.

Predictions of Success based on groups of managers in specific job functions are uniformly higher than global predictions for the sample as a whole. The differences are not great, but they are consistent. Directly comparative figures are not available from most of the research literature, but the level of the global predictions obtained in this study are higher than those generally reported. This may be due, as argued earlier to the fact that there are only two job functions represented in the entire sample, and therefore there is less chance for a wide variety of differences between a wide variety of types of jobs to blur the overall picture of a successful manager.

Conclusions for Hypothesis 4

While the differences are not large, there does appear to be a consistently higher level of prediction

of success when managers are grouped by specific job function than when they are lumped together without regard for functional differences. The significances of the discriminant functions for Operations managers are poor, and therefore the prediction levels for that group should probably be ignored. While one can argue that the data for Service managers alone supports the hypothesis, the point is weakened considerably by the fact that the comparison is made between only one functional grouping and a global sample. Had there been four or five functional groups, all of which exhibited higher levels of prediction based on significant discriminant functions, the contention that hypothesis 4 is supported would be stronger.

CHAPTER 6

DISCUSSION AND CONCLUSIONS

The Predictor Variables

Test Validity. A basic question posed by research of this sort is whether tests of cognitive abilities, personality characteristics, and leadership style have validity as predictors of managerial success. Both Ghiselli (1973) and Korman (1968) point out that the findings from psychometric testing are erratic. The approach is based on two major assumptions: (a) that the tests employed produce scores that accurately reflect critical behavioural factors, and (b) that these are the factors that underlie successful organizational behaviour. Unfortunately there is some real doubt about both these assumptions.

It would appear that singly, personality traits have very little predictive power, but that they combine and interact in some fashion to form a "character set" which relates to success. However, there may be little relation between the labels of the

variables in this "set" and behaviour that is perceived to fall within the same categories. A test score which reveals that the respondent is high on sociability does not necessarily mean that observers would note that trait. The research comparing clinical and actuarial assessments tends to confirm this. However, if the basic question is to be able to predict success on some basis or other, then does it matter whether "sociability" as a test score does not correspond with observed behaviour, as long as the test score correlates with the criterion measure? If there is a set of personality variables which, when evidenced in the responses of an individual to a particular test, relates strongly to that individual's subsequent success in a certain situation, do we have to be concerned whether the scores reflect "real" behaviour or are simply a construct? To some extent, therefore, it is not important whether (a) the tests used plumb critical behavioural factors, or (b) that we fully understand the behaviour that leads to managerial effectiveness and success. It may be quite enough to adopt an empirical-criterion approach and allow for black box interrelationships which produce the desired results.

This study takes a pragmatic approach to the problem of predicting managerial success. It is not

concerned with identifying and validating specific traits which describe and explain success; it is concerned with being able to generate, on an empirical-criterion basis, levels of prediction that make the process useful for organizations. Organizations spend a great deal of time and money in selection, reward, and promotion of managers. There are no hard figures on it, but it is argued that people represent the major cost of the vast majority of organizations, and therefore if there is any technology which can assist in making these decisions, many firms feel they could allocate their resources more wisely by utilizing it. A psychometric test base is one possible avenue of exploration. There is nothing new about testing, and there is nothing new about using tests as a basis for predicting success, but in the latter instance there have been so few successful experiences that positive results from a situational approach could bring about a renewed effort in the field.

If one is to accept the underlying assumption of validity of the test measures, and to accept that the interpretations of the variables are accurate, then the data can be seen in an explanatory light. We begin to understand what sort of cognitive ability levels, what sorts of personality characteristics, and what leadership styles are appropriate for success

in certain types of jobs. The profiles generated in this study of successful managers in relatively unstructured jobs and relatively structured jobs vary quite considerably. We have no trouble discriminating between them statistically. The more structured job requires a higher degree of Initiating Structure, and a hardboiled character, combined with some element of analytic ability, while the less structured job requires a more Considerate management style in order to be successful. On the basis of three variables (Watson-Glaser, LOQ-Structure, and Masculinity (M)), successful managers in the two functions examined in the study can be classified 93.75% of the time. While the argument of causality can be brought up from a statistical standpoint, practically speaking it would appear that the job is specified first, and then the manager is placed into it. The structure of the job is not caused by the style of the manager in this instance -- there are too many of them for this process to be taking place identically in 53 separate cases -- it is in place, and the manager must adapt his style to it.

The Choice of Instruments. The sixteen test variables were all significant predictors of some relationship between the four subgroups in the sample. That each single measure appeared as a discriminating

factor at least once is probably the result of the particular choice of instruments. As mentioned in Chapter Four, the tests for the study were all chosen on the basis of having had positive findings in similar research. While this study was in part exploratory, it cannot be tarred with Korman's brush as being a random correlational study. However, this is not to say that the choice of variables was optimal. There may be other combinations of variables which produce higher level results. Their discovery is not the job of this study, but it might well be engaged by further research in the field.

From a practical point of view, the tests chosen for predictive studies need to be reliable, valid in a criterion validity sense, and parsimonious. Lengthy test batteries such as SCORES, used by Flanagan and Krug (1964) are not practical from an organizational point of view. If that length of managerial time is required (twelve hours), then organizations are more likely to implement assessment centre techniques which take two days or so, but which generate more data and have a greater acceptability in the business world.

It would also appear, from the results generated by this study, that a set of tests should include measures of cognitive abilities, personality characteristics, and leadership style, since all three of

these factors were discriminant when differences were examined between Successful and Unsuccessful managers and between Successful managers in different job functions. Managerial success appears to be based on a combination of these three factors; it is not enough to be bright without having some specific leadership characteristics, or vice-versa, or without having certain personality characteristics which are necessary for success. When organizations look for managers with promotional potential, they appear to seek individuals who are rounded in some sense -- a modern, chromium, version of Renaissance Man.

Variable Interpretation. The Pearson correlations between the sixteen predictor variables in Appendix F show that there is some overlap between the various types of measures. Looking at correlations of .20 or higher, there are a number of relationships between the cognitive ability variables and some of the personality variables. For instance, the verbal/numeric AH5 score is correlated .25 with General Activity (G); the diagrammatic AH5 score similarly shows a correlation of .31 with General Activity (G), and is negatively correlated (-.22) with Restraint (R). In other words, it appears that energy, enthusiasm, impulsiveness, and a happy-go-lucky approach to life correlate with intelligence. The Watson-Glaser

Critical Thinking Appraisal correlates $-.25$ with Thoughtfulness (T), and $.21$ with Masculinity (M), which implies that managers who are able to separate inference from fact, interpret data, make deductions, and draw conclusions, tend to be hardboiled and somewhat action oriented.

The leadership style measures also correlate with a number of personality scores. Consideration correlates negatively ($-.21$) with Ascendance (A), and $.25$ with Thoughtfulness (T), while Initiating Structure correlates positively with Ascendance (A) ($.31$), $.29$ with Sociability (S), $.20$ with Thoughtfulness (T), and $.21$ with Masculinity (M). In other words, managers who perceive themselves high on Consideration are also shy, retiring and reflective. Managers high on Initiating Structure are also persuasive and conspicuous, outgoing, reflective, and hardboiled.

These types of relationships between cognitive, leadership, and personality variables partially explain the results commented on earlier. Perhaps the reason that successful managers are discriminated by a combination of cognitive abilities, personality characteristics and leadership styles is that the measures of these three things overlap. It is a mildly disturbing thought, but the four test instruments may simply be measuring the same phenomena over different ranges.

The Moderator Variable

There are a variety of situational elements suggested in the literature. These include superiors, subordinates, peers, the organizational climate, organizational structure, level of job, and type of job. Job type can be differentiated on the basis of such things as time span of discretion, range of responsibility, power differentials, and a host of other measures. Degree of task structure is only one situational variable out of many.

There are definitely differences between the styles and characteristics of managers in different functions. In all organizations, there are commonly held perceptions of managers in various functions. Depending on whom one talks to, the caricatures of the functions change. Perceptions of one's own function are always more favourable than those of other functions. Inaccurate as these caricatures may be, they are a clear beacon signalling for some sort of situational differentiation in the determination of effective behaviours and characteristics, and the prediction of success.

Task structure is an hypothesised variable that moderates between managerial behaviour and success. Fiedler (1967), Hersey and Blanchard (1968), Reddin (1970) and others have argued that the way the job is

structured affects how a manager should handle it to be effective, and the measure, from a practical point of view, is easy to apply, and appears to differentiate between a range of different jobs.

The Criterion Measure

As the survey of the literature indicates, there is a tremendous amount of debate over the issue of criteria of effectiveness and success. A number of writers have criticised the use of global criteria such as overall success, promotion, or general effectiveness ratings, on the basis that they do not tell us much about what the specifics of effective behaviour are and therefore are of little help in terms of being able to train and develop managers to exhibit these sorts of behaviours. As we have noted, the correlations with specific personality, cognitive ability, or leadership style variables are generally low. But in spite of that, this study was able to get high levels of prediction of success, and a high degree of discrimination between effectiveness in two different functions. The problem is that we know, to a degree, what factors relate to success, but we don't really understand what "success" means or what the causal direction is between so-called predictors and success.

A second argument against the combination of a single criterion measure and multiple predictor measures is that, if a correlation of 1.0 is hypothetically possible, there should be a logical match between each of the predictors and a component of the criterion. That is, the single criterion should represent a unitary collection of a variety of components. Since this is highly unlikely, there is bound to be a mismatch between the predictor variables and the criterion. Some of the predictors will correspond to elements of the criterion measure, and some will not, resulting in correlations lower than 1.0.

Smith (1976) maintains that the requirements of a criterion measure are, (a) that it be relevant to an important goal of the organization, (b) that it should be neither biased or trivial, (c) that it be reliable, and (d) that it be available, plausible, and acceptable to those who want to use it for decisions. On the basis of these requirements, success as a criterion measure for the organization under study seems to be quite adequate.

The main area for debate is over the reliability of success as a criterion. Laurent (1961, 1962) argued in the Standard Oil studies that individuals identified as "potential successfals" had already achieved a measure of success by getting as far as they had in

the organization, and therefore they could be expected to exhibit the required flexibility and adaptability to meet changing conditions in the future. The logic is questionable. One of the real dangers of predicting future success on the basis of present success criteria is that conditions will change to a greater degree than the range of success variables can accommodate, and that if the predictive data is used to further the careers of those who score well on the measures of the day, there is then a possibility that an entire group of obsolete managers will be put into a position to lead an organization which has long since exceeded their reach.

This is the major shortcoming of this research. If the process is to be institutionalized and used for purposes of selection, reward, and promotion, then there is a very clear need for constant updating of the measures, and for some attempt at assessing the likely changes that will occur so as to be able to build associated factors into the equations. Simply taking measures of successful managers and then using them as the criteria for subsequent individuals is not likely to be helpful in the long run.

The Overall Design

This research can be criticised on a number of issues. First, it is limited to a single organization,

which brings the generality of the results into question. Secondly, only two different types of jobs are examined, and it is still unclear as to whether this methodology would work with a range of jobs, separated on a task structure scale. Third, only three years elapsed between the time of the measures being taken and the criterion measure being applied. Perhaps this is not enough time for the characteristics of success to show through fully. If more time had been taken, would the overall picture of differentiation change? Would it have improved, as those cases which were classified as "successfuls", but who had not been promoted would have received their just due? Fourth, were there specific conditions in the employment market at the time, or were there unique factors within the company itself which biased the results?

Obviously, questions of time entered into this particular study. In a subjective examination of the company in question it appeared as though three years was an adequate time span for promotion to occur. This particular firm has a reputation of rapid change and advancement, and senior managers agreed that the three year time lapse would be adequate. Also, because of the general antipathy towards the idea of predicting managerial success on the basis of psychometric tests, it was found to be difficult to persuade organizations to enter into this type of project. A compounding

factor was that if the criterion measure was not to be contaminated, the organization involved could not utilize the results, and could not provide any feedback to the individuals or their managers until the project was completed. This was a stumbling block for a number of firms.

Given the number of unanswered questions, further research seems to be called for. At present a number of Canadian organizations have been approached about entering into a ten-year series of studies to replicate the data from this research and to test a variety of different variables and tests.

The Findings

This research addressed itself to four hypotheses centred around prediction of managerial success based on differences between job functions. The sample was broken into four parts, by Job Function and by Success, as shown in Figure 6-1, and the differences between Successful managers within function, Successful managers between functions, and Unsuccessful managers between functions were tested. In order to make a case for making predictions on the basis of separate job function rather than on a global, organization-wide basis, the research attempted to show that there were indeed differences in the variables descriptive of success between functions.

The findings support the general hypothesis that there are differences in predictors of success between managers in a relatively structured job (Service managers), and managers in a more unstructured job (Operations managers).

Hypothesis 1, that there are significant differences in cognitive abilities, personality characteristics, and self-perceived leadership style between Successful and Unsuccessful managers within specific job function was partially confirmed. Clear and significant differences were shown for Successful and Unsuccessful Service managers, but the differentiating variables for Operations managers were not statistically significant at the .05 level, although they showed strong indications of discrimination.

Hypothesis 2, that there are significant differences in cognitive abilities, personality characteristics, and self-perceived leadership style between Successful managers in different job functions was supported by the results. The high level of significance of the differentiating variables, and the very high levels of classification obtained by discriminant analyses make the point of differences in profiles between Successful Service and Operations managers clearly.

		<u>JOB FUNCTION</u>	
		Service Managers (N = 51) (Structured: Shaw Scale = 10.3)	Operations Managers (N = 23) (Unstructured: Shaw Scale = 13.6)
<u>STATUS</u>	Successful (N = 16)	(A) (n = 10)	(C) (n = 6)
	Unsuccessful (N = 58)	(B) (n = 41)	(D) (n = 17)

Figure 6-1. The total sample of managers (N = 74) broken down by Job Function (Service managers and Operations managers), and by Status (promoted or not promoted three years after being tested).

Hypothesis 3, that there are no differences in cognitive abilities, personality characteristics, and self-perceived leadership style between Unsuccessful managers in different job functions, was not confirmed. However, the differences were so few and so blurred that one can conclude that there is a high degree of homogeneity between Unsuccessful managers across functions. This finding raises the issue of when predictor variables of the type used in this study are applicable. There may be a general level to which managers may rise without demonstrating unique or idiosyncratic characteristics. However, as they become more firmly streamed in functional specialties, certain characteristics become dominant in determining further progress. This is an hypothesis which may be investigated with further study.

Hypothesis 4 attempted to make the main point of the study, that prediction of managerial success can be made more accurately if managers are segmented by job function. While the results showed some improvement over a global approach to prediction, the margin was not great. Several reasons were hypothesised to account for this, and once again, only further study will be able to test the hypothesis more fully.

Hypothesis 4 was supported to the degree that other organizations may now be interested to pursue the

line of investigation further.

General Conclusions and Implications for Future Research

The findings of this research are encouraging. There does seem to be a rationale for differentiating between jobs on the basis of task structure in order to obtain higher levels of prediction of managerial success. Perhaps this will give the field some impetus to examine situational variables more closely, and to incorporate them into actuarial studies of effectiveness and success.

The general results of psychometric testing as a base for predicting success were of such low quality as to have essentially stopped investigation in the area. Researchers have moved on to more fruitful fields of endeavor rather than waste time replicating what many have argued are pointless correlational exercises. A situational approach is a way out of this dilemma. If consistently better results can be achieved through using situational variables as moderators between psychometric test measures and criterion ratings, perhaps new energies will be directed to the field.

The technology presented by psychometric prediction of success is useful as an additional tool for personnel managers to utilize in decisions regarding selection, reward, and promotion. When the numbers and costs allow it, assessment centres provide a well

tested device which can be validated and adapted to specific company needs. But in cases where a large number of managers are concerned, the costs and time involved in the assessment centre process become prohibitive, and it makes some sense to gather psychometric data for analysis.

Problems of obsolescence of the measures in the face of rapidly changing environments can be overcome by a process of periodic testing and data gathering. If measures are taken over a number of levels every three years and results are correlated with those of previous years, and differences examined, there seems little reason why norms cannot be adjusted to fit the changing requirements of the organization. The criterion measure must be expanded to something more representative of effectiveness than just plain success, which can occur as a result of being at the right place at the right time. If data is gathered for jobs in specific functions at a succession of levels, managerial potential may be identified at relatively early stages in an individual's career.

The objectives of the research, limited as they are, appear to have been achieved. A situational approach to the prediction of managerial success has been long overdue, and hopefully the results of this

study will vindicate Dunnette and others in their call for work of this type.

APPENDIX A

Instructions and Protocol for Test Administrators

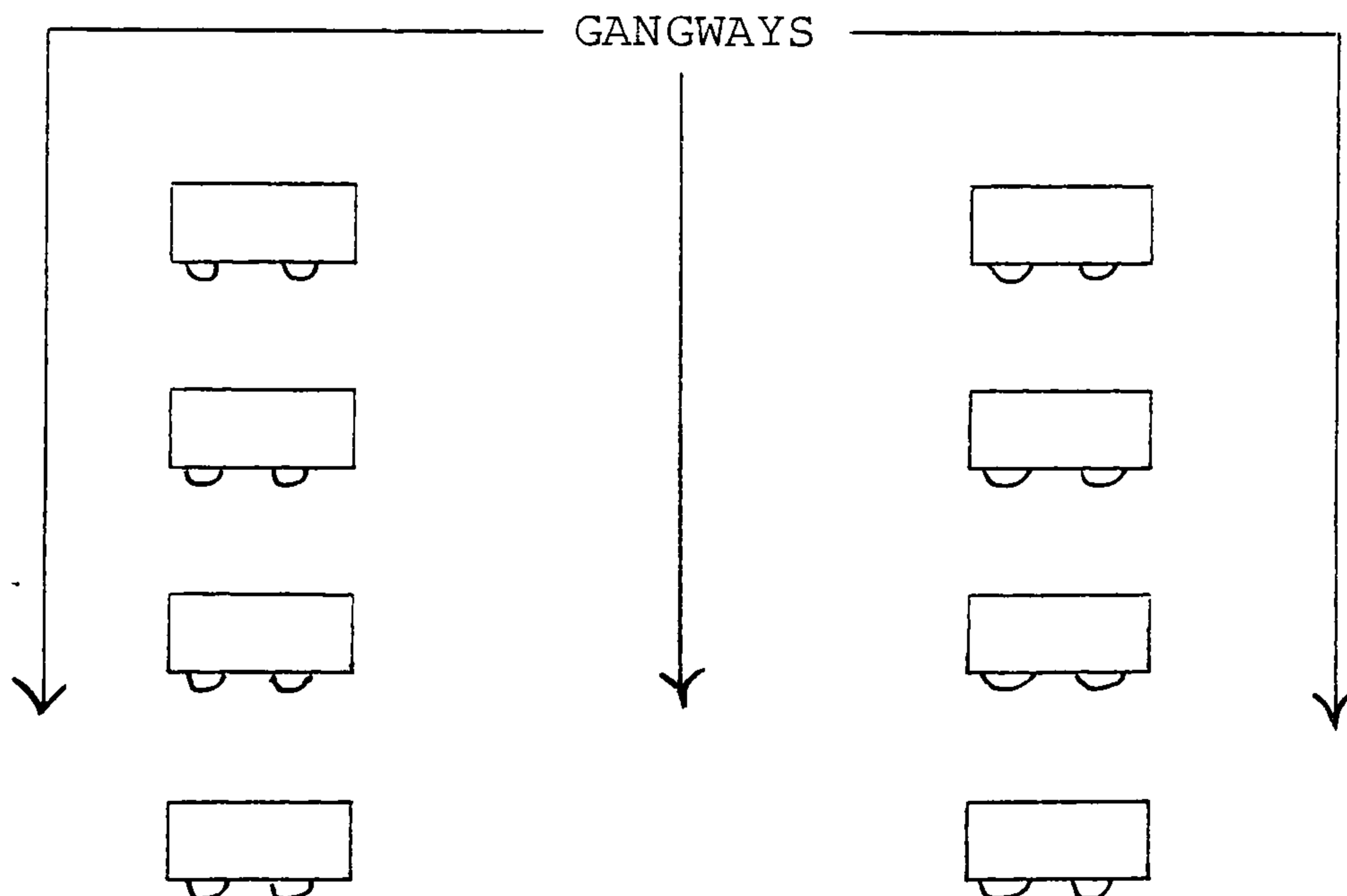
INSTRUCTIONS FOR TEST ADMINISTRATORS

PREPARATION

NOTE: Do not allow people to be tested into the room until the session is ready to begin.

1. Allow $\frac{1}{2}$ hour for preparation before the session.
2. Set out tables and chairs in classroom fashion.
 - There should be no more than two people at each table.
 - Three feet should be allowed for each person.
 - There should be ample room for the administrators to walk between tables (See Diagram).

ADMINISTRATORS TABLE



3. Once preparation for the session has started DO NOT LEAVE THE ROOM UNATTENDED AT ANY TIME UNTIL TEST SESSION HAS BEEN COMPLETED AND ALL PAPERS PACKED UP AND REMOVED.

4. Lay out two pencils (sharpened) for each person. Make sure there is a pencil sharpener and rubber available.
5. Lay out test papers and answer sheets on the administrator's table in the order they will be required. (DO NOT LEAVE UNATTENDED).
6. Set up flip chart board with blank paper.
 - Write date on top sheet.
7. Remove telephones and place "do not disturb" notice on door.
8. Have labeled envelopes ready for completed answer sheets and arrange secure place to put them when each test is completed.

ADMINISTRATION OF TEST SESSION

1. When preparation has been completed and the test session is due to begin allow people to be tested to choose own seats. Do not wait for late arrivals.
2. Introduce test administrators.
3. Give set presentation on purpose of tests, how they will be scored and how they will be used.
4. Give the instructions for each test in a loud clear voice keeping exactly to the standard script.
 Make sure there is complete silence before beginning the instructions.
 Speak slowly and pause between each point.
 Be serious and discourage laughing.
5. Time the AH5 accurately. If you have not got a stop watch or an elapsed time bezel, write down exact start time, and time due for completion.
6. Make sure people stop when you tell them to.
7. Walk slowly round the room occasionally while test is in progress, to ensure that answers are being put in the right place.
8. Do not stand by any one person and watch what they are doing over their shoulder.
9. (9.1) Collect the booklets and answer sheets. Check numbers of each carefully against number of people present.
 (9.2) Check that code numbers and the date have been entered in each answer sheet.
 (9.3) Check booklets carefully to make sure that they have not been written on.
10. Put answer sheets in labeled envelope, seal and put in a safe place.
11. Allow a short break between each test and encourage people to jump up and leap about a bit.

LATE ARRIVALS

If someone arrives in the middle of the first test - have him sit outside until it is completed. He can have an opportunity to sit it later. If more than one test is missed, and there is time after - he will have to sit two. If there is another session in the afternoon - ask him if he can attend that one.

INTRODUCTION TO TEST SESSIONS TO BE GIVEN BY TEST ADMINISTRATORS

I am an will be administering the tests. This is who will be assisting me.

This session will take three hours with four tests and a break between each. You will be given instructions before each test.

PURPOSE

As you know, the purpose of the Management Talent Survey is to increase the fairness and objectivity of promotion decisions by using tests in addition to other measures currently used, e.g., S.D.P. assessments, performance records, training assessments. The tests will be used in conjunction with other measures, for example, in the case of two people being equal in all other respects, the one with the higher test scores will have an advantage when it comes to promotion. Tests also measure a person's potential, i.e. what they should be capable of doing in the future, and thus, they give people more chance of being shortlisted for jobs for which they might otherwise be considered.

HOW THEY WILL BE SCORED

The tests will all be scored by qualified people from outside the company and the test papers will be destroyed as soon as they are scored.

As we mentioned in the letter, you all have a number which you use instead of your name on test papers. This means that no one will know whose test paper they are marking.

HOW THEY WILL BE USED

After the tests are scored the scores, together with the person's number only will be transferred to cards which are kept in the P. and A. Department. Should a shortlist of people be required for a job, those "numbers" (not names) which have scores within the appropriate ranges for that particular job can be pulled out a list of numbers given to . He can then transfer this to names since he will be the only person holding the list. In this way, at no time will names ever be associated with scores. At no time will an individual's actual scores be released to his boss or anyone within the company.

To claim expenses you have incurred during the Management Talent Survey, could you fill in a normal expense form

and send it to .

Any queries or problems before we start the test session?

APPENDIX B

Descriptive Statistics of Predictor
Variables by Status, and by Function

Table B-1. Descriptive Statistics of Predictor Variables by Status (Successful or Unsuccessful).
 Total Sample Size, (All) N = 74.
 Successful, N = 16
 Unsuccessful, N = 58

Variable: AH51 Verbal-Numeric Intelligence

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	12.189	4.419	19.525
Successful	13.750	6.105	37.267
Unsuccessful	11.759	3.785	14.327

Variable: AH52 Diagrammatic Intelligence

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	16.811	5.160	26.621
Successful	18.437	5.086	25.862
Unsuccessful	16.362	5.132	26.340

Variable: AH5 Sum Intelligence Sum Score

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	28.865	8.701	75.708
Successful	31.562	9.852	97.062
Unsuccessful	28.121	8.295	68.810

Variable: Watson-Glaser Critical Thinking Appraisal

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	69.203	9.592	91.999
Successful	71.625	9.458	89.450
Unsuccessful	68.534	9.601	92.183

Variable: LOQ Consideration

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	52.514	6.405	41.020
Successful	50.125	6.622	43.850
Unsuccessful	53.172	6.241	38.952

Variable: LOQ Structure

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	54.811	7.074	50.046
Successful	58.563	7.831	61.329
Unsuccessful	53.776	6.551	42.914

Variable: Guilford-Zimmerman: General Activity (G)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	19.297	4.131	17.061
Successful	21.250	3.130	9.800
Unsuccessful	18.759	4.232	17.906

Variable: Guilford-Zimmerman: Restraint (R)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	19.203	4.360	19.013
Successful	17.750	4.810	23.133
Unsuccessful	19.603	4.184	17.507

Variable: Guilford-Zimmerman: Ascendance (A)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	21.189	3.751	14.073
Successful	23.375	2.754	7.583
Unsuccessful	20.586	3.784	14.317

Variable: Guilford-Zimmerman: Sociability (S)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	20.595	4.332	18.765
Successful	22.063	3.750	14.062
Unsuccessful	20.190	4.423	19.560

Variable: Guilford-Zimmerman: Emotional Stability (E)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	21.122	3.527	12.437
Successful	22.688	2.272	5.163
Unsuccessful	20.690	3.700	13.691

Variable: Guilford-Zimmerman: Objectivity (O)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	21.000	4.075	16.603
Successful	21.000	2.394	5.733
Unsuccessful	21.000	4.445	19.754

Variable: Guilford-Zimmerman: Friendliness (F)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	13.865	4.630	21.434
Successful	11.625	4.745	22.517
Unsuccessful	14.483	4.442	19.728

Variable: Guilford-Zimmerman: Thoughtfulness (T)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	18.608	3.975	15.803
Successful	17.188	4.736	22.429
Unsuccessful	19.000	3.960	13.614

Variable: Guilford-Zimmerman: Personal Relations (P)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	19.932	3.830	14.667
Successful	21.375	3.304	10.917
Unsuccessful	19.534	3.894	15.165

Variable: Guilford-Zimmerman: Masculinity (M)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	21.068	3.349	11.215
Successful	22.188	3.371	11.362
Unsuccessful	20.759	3.305	10.923

Table B-2. Descriptive Statistics of Predictor Variables by Job Function (Service Managers, or Operations Managers). Total Sample Size (ALL) N = 74
Service Managers N = 51
Operations Managers N = 23

Variable: AH51 Verbal-Numeric Intelligence

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	12.189	4.419	19.525
Service	12.373	4.634	21.478
Operations	11.783	3.965	15.723

Variable: AH52 Diagrammatic Intelligence

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	16.811	5.160	26.621
Service	17.333	4.840	23.427
Operations	15.652	5.749	33.055

Variable: AH5 Sum Intelligence Sum Score

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	28.865	8.701	75.708
Service	29.510	8.596	73.895
Operations	27.435	8.954	80.166

Variable: Watson-Glaser Critical Thinking Appraisal

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	69.203	9.592	91.999
Service	70.078	9.273	85.994
Operations	67.261	10.203	104.111

Variable: LOQ Consideration

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	52.514	6.405	41.020
Service	51.431	6.592	43.450
Operations	54.913	5.351	28.628

Variable: LOQ Structure

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	54.811	7.074	50.046
Service	56.118	6.887	47.426
Operations	51.913	6.748	45.538

Variable: Guilford-Zimmerman General Activity (G)

	<u>Mean</u>	<u>Std. Deviance</u>	<u>Variance</u>
All	19.297	4.131	17.061
Service	18.804	3.795	14.401
Operations	20.391	4.698	22.067

Variable: Guilford-Zimmerman Restraint (R)

	<u>Mean</u>	<u>Std. Deviance</u>	<u>Variance</u>
All	19.203	4.360	19.013
Service	18.627	4.214	17.758
Operations	20.478	4.501	20.261

Variable: Guilford-Zimmerman Ascendance (A)

	<u>Mean</u>	<u>Std. Deviance</u>	<u>Variance</u>
All	21.189	3.751	14.073
Service	21.137	3.353	11.241
Operations	21.304	4.597	21.130

Variable: Guilford-Zimmerman Sociability (S)

	<u>Mean</u>	<u>Std. Deviance</u>	<u>Variance</u>
All	20.595	4.332	18.765
Service	20.333	4.087	16.707
Operations	21.174	4.877	23.787

Variable: Guilford-Zimmerman Emotional Stability (E)

	<u>Mean</u>	<u>Std. Deviance</u>	<u>Variance</u>
All	21.122	3.527	12.437
Service	20.941	3.770	14.216
Operations	21.522	2.952	8.715

Variable: Guilford-Zimmerman Objectivity (O)

	<u>Mean</u>	<u>Std. Deviance</u>	<u>Variance</u>
All	21.000	4.075	16.603
Service	20.745	4.218	17.794
Operations	21.565	3.764	14.166

Variable: Guilford-Zimmerman Friendliness (F)

	<u>Mean</u>	<u>Std. Deviance</u>	<u>Variance</u>
All	13.865	4.630	21.434
Service	13.824	4.524	20.468
Operations	13.957	4.959	24.589

Variable: Guilford-Zimmerman Thoughtfulness (T)

	<u>Mean</u>	<u>Std. Deviance</u>	<u>Variance</u>
All	18.608	3.975	15.803
Service	18.216	3.743	14.013
Operations	19.478	4.409	19.443

Variable: Guilford-Zimmerman Personal Relations (P)

	<u>Mean</u>	<u>Std. Deviance</u>	<u>Variance</u>
All	19.932	3.830	14.667
Service	19.882	4.087	16.706
Operations	20.043	3.268	10.680

Variable: Guilford-Zimmerman Masculinity (M)

	<u>Mean</u>	<u>Std. Deviance</u>	<u>Variance</u>
All	21.068	3.349	11.215
Service	21.451	3.585	12.853
Operations	20.217	2.628	6.905

Table B-3. Descriptive Statistics of Predictor Variables for Subsample of Service Managers only.
 Service Managers, N = 51
 Successful Service Managers, N = 10
 Unsuccessful Service Managers, N = 41

Variable: AH51 Verbal Numeric Intelligence

	<u>Mean</u>	<u>Std. Deviance</u>	<u>Variance</u>
All	12.372	4.634	21.478
Successful	13.900	3.969	46.100
Unsuccessful	12.000	6.790	15.750

Variable: AH52 Diagrammatic Intelligence

	<u>Mean</u>	<u>Std. Deviance</u>	<u>Variance</u>
All	17.333	4.840	23.427
Successful	18.700	4.423	19.567
Unsuccessful	17.000	4.929	24.300

Variable: AH5 Sum Intelligence Sum Score

	<u>Mean</u>	<u>Std. Deviance</u>	<u>Variance</u>
All	29.510	8.596	73.895
Successful	31.600	10.287	105.822
Unsuccessful	29.000	8.198	67.200

Variable: Watson-Glaser Critical Thinking Appraisal

	<u>Mean</u>	<u>Std. Deviance</u>	<u>Variance</u>
All	70.078	9.273	85.994
Successful	72.500	10.212	104.278
Unsuccessful	69.488	9.067	82.206

Variable: LOQ Consideration

	<u>Mean</u>	<u>Std. Deviance</u>	<u>Variance</u>
All	51.431	6.592	43.450
Successful	48.400	6.535	42.711
Unsuccessful	52.171	6.469	45.845

Variable: LOQ Structure

	<u>Mean</u>	<u>Std. Deviance</u>	<u>Variance</u>
All	56.118	6.887	47.426
Successful	61.900	6.485	42.100
Unsuccessful	54.707	6.278	39.412

Variable: Guilford-Zimmerman General Activity (G)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	18.804	3.795	14.401
Successful	21.500	2.953	8.722
Unsuccessful	18.146	3.712	13.778

Variable: Guilford-Zimmerman Restraint (R)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	18.627	4.214	17.758
Successful	17.500	4.089	16.722
Unsuccessful	18.902	4.247	18.040

Variable: Guilford-Zimmerman Ascendance (A)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	21.137	3.353	11.241
Successful	23.500	2.173	4.722
Unsuccessful	20.561	3.354	11.252

Variable: Guilford-Zimmerman Sociability (S)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	20.333	4.087	16.707
Successful	23.100	3.178	10.100
Unsuccessful	19.658	4.029	16.230

Variable: Guilford-Zimmerman Emotional Stability (E)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	20.941	3.770	14.216
Successful	22.600	2.066	4.267
Unsuccessful	20.537	3.994	15.955

Variable: Guilford-Zimmerman Objectivity (O)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	20.745	4.218	17.794
Successful	20.600	2.366	5.600
Unsuccessful	20.780	4.580	20.976

Variable: Guilford-Zimmerman Friendliness (F)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	13.823	4.524	20.468
Successful	11.100	2.331	5.433
Unsuccessful	14.433	4.696	22.056

Variable: Guilford-Zimmerman Thoughtfulness (T)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	18.216	3.743	14.012
Successful	16.500	2.677	7.167
Unsuccessful	18.634	3.871	14.988

Variable: Guilford-Zimmerman Personal Relations (P)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	19.882	4.087	16.706
Successful	21.700	3.057	9.344
Unsuccessful	19.439	4.213	17.752

Variable: Guilford-Zimmerman Masculinity (M)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	21.451	3.585	12.852
Successful	23.900	2.885	8.322
Unsuccessful	20.854	3.511	12.328

Table B-4 Descriptive Statistics of Predictor Variables for Subsample of Operations Managers only.
 Operations Managers, N = 23
 Successful Operations Managers, N = 6
 Unsuccessful Operations Managers, N = 17

Variable: AH51 Verbal-Numeric Intelligence

	<u>Mean</u>	<u>Std. Deviance</u>	<u>Variance</u>
All	11.7826	3.965	15.723
Successful	13.500	5.357	28.700
Unsuccessful	11.176	3.340	11.154

Variable: AH52 Diagrammatic Intelligence

	<u>Mean</u>	<u>Std. Deviance</u>	<u>Variance</u>
All	15.652	5.749	33.055
Successful	18.000	6.481	42.000
Unsuccessful	14.823	5.434	29.529

Variable: AH5 Sum Intelligence Sum Score

	<u>Mean</u>	<u>Std. Deviance</u>	<u>Variance</u>
All	27.435	8.953	80.166
Successful	31.500	10.035	100.700
Unsuccessful	26.000	8.389	70.375

Variable: Watson-Glaser Critical Thinking Appraisal

	<u>Mean</u>	<u>Std. Deviance</u>	<u>Variance</u>
All	67.261	10.203	104.111
Successful	70.167	8.750	76.567
Unsuccessful	66.235	10.721	114.941

Variable: LOQ Consideration

	<u>Mean</u>	<u>Std. Deviance</u>	<u>Variance</u>
All	54.913	5.351	28.628
Successful	53.000	6.229	38.800
Unsuccessful	55.588	5.038	25.382

Variable: LOQ Structure

	<u>Mean</u>	<u>Std. Deviance</u>	<u>Variance</u>
All	51.913	6.748	45.537
Successful	53.000	6.986	48.800
Unsuccessful	51.588	6.838	46.765

Variable: Guilford-Zimmerman General Activity (G)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	20.391	4.698	22.067
Successful	20.833	3.656	13.367
Unsuccessful	20.235	5.105	26.066

Variable: Guilford-Zimmerman Restraint (R)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	20.478	4.501	20.261
Successful	18.167	6.242	38.967
Unsuccessful	21.294	3.601	12.971

Variable: Guilford-Zimmerman Ascendance (A)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	21.304	4.597	21.130
Successful	23.167	3.764	14.167
Unsuccessful	20.647	4.782	22.868

Variable: Guilford-Zimmerman Sociability (S)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	21.174	4.877	23.787
Successful	20.333	4.274	18.267
Unsuccessful	21.471	5.161	26.640

Variable: Guilford-Zimmerman Emotional Stability (E)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	21.522	2.952	8.715
Successful	22.833	2.887	7.767
Unsuccessful	21.059	2.947	8.684

Variable: Guilford-Zimmerman Objectivity (O)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	21.565	3.764	14.166
Successful	21.667	2.503	6.267
Unsuccessful	21.529	4.185	17.515

Variable: Guilford-Zimmerman Friendliness (F)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	13.956	4.959	24.589
Successful	12.000	7.503	56.300
Unsuccessful	14.471	3.891	15.140

Variable: Guilford-Zimmerman Thoughtfulness (T)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	19.478	4.409	19.443
Successful	18.333	7.202	51.867
Unsuccessful	19.882	3.140	9.860

Variable: Guilford-Zimmerman Personal Relations (P)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	20.043	3.268	10.680
Successful	20.833	3.920	15.367
Unsuccessful	19.765	3.093	9.566

Variable: Guilford-Zimmerman Masculinity (M)

	<u>Mean</u>	<u>Std. Deviation</u>	<u>Variance</u>
All	20.217	2.628	6.905
Successful	19.333	1.862	3.467
Unsuccessful	20.529	2.831	8.015

APPENDIX C

T-Tests of Differences of Sample Means for
Predictor Variables by Status and by Function

Table C-1. T-Test of Differences of Sample Means for Predictor Variables between Successful Service Managers (N = 10) and Unsuccessful Service Managers (n = 4).
 * Significantly Different at the .05 level
 ** Significantly Different at the .01 level

<u>VARIABLE</u>	<u>T-VALUE</u>	<u>2-TAIL PROB.</u>
AH51 Verbal Numeric Intelligence	+0.85	.413
AH52 Diagrammatic Intelligence	+1.00	.324
AH5 Intelligence Sum Score	+0.86	.397
Watson-Glaser Critical Thinking Appraisal	+0.92	.362
LOQ Consideration	-1.65	.105
LOQ Structure	+3.23	.002**
Guilford-Zimmerman General Activity (G)	+2.65	.011**
G-Z Restraint (R)	-0.94	.351
G-Z Ascendance (A)	+2.63	.011*
G-Z Sociability (S)	+2.51	.015*
G-Z Emotional Stability (E)	+2.28	.030*
G-Z Objectivity (O)	-0.17	.863
G-Z Friendliness (F)	-3.26	.003**
G-Z Thoughtfulness (T)	-1.64	.107
G-Z Personal Relations (P)	+1.59	.118
G-Z Masculinity (M)	+2.54	.014**

Table C-2. T-Test of Differences of Sample Means for Predictor Variables between Successful Operations Managers (N = 6) and Unsuccessful Operations Managers (N = 17).

<u>VARIABLE</u>	<u>T-VALUE</u>	<u>2-TAIL PROB.</u>
AH51 Verbal Numeric Intelligence	+1.25	.225
AH52 Diagrammatic Intelligence	+1.17	.254
AH5 Intelligence Sum Score	+1.31	.203
Watson-Glaser Critical Thinking Appraisal	+0.80	.430
LOQ Consideration	-1.02	.320
LOQ Structure	+0.45	.657
G-Z General Activity (G)	+0.26	.796
G-Z Restraint (R)	-1.50	.147
G-Z Ascendance (A)	+1.16	.258
G-Z Sociability (S)	-0.48	.635
G-Z Emotional Stability (E)	-1.28	.213
G-Z Objectivity (O)	-0.08	.941
G-Z Friendliness (F)	-0.61	.561
G-Z Thoughtfulness (T)	-0.51	.623
G-Z Personal Relations (P)	-0.68	.504
G-Z Masculinity (M)	-0.96	.350

Table C-3. T-Test of Differences of Sample Means for Predictor Variables between Successful Service Managers (N = 10) and Successful Operations Managers (n = 6).

* Significantly Different at the .05 level

** Significantly Different at the .01 level

<u>VARIABLE</u>	<u>T-VALUE</u>	<u>2-TAIL PROB.</u>
AH51 Verbal Numeric Intelligence	+0.12	.904
AH52 Diagrammatic Intelligence	+0.26	.800
AH5 Intelligence Sum Score	+0.02	.985
Watson-Glaser Critical Thinking		
Appraisal	+0.47	.649
LOQ Consideration	-1.39	.187
LOQ Structure	-2.58	.022*
G-Z General Activity (G)	+0.40	.695
G-Z Restraint (R)	-0.26	.799
G-Z Ascendance (A)	+0.23	.824
G-Z Sociability (S)	+1.48	.160
G-Z Emotional Stability (E)	-0.19	.850
G-Z Objectivity (O)	-0.85	.407
G-Z Friendliness (F)	-0.44	.672
G-Z Thoughtfulness (T)	-0.60	.571
G-Z Personal Relations (P)	-0.50	.628
G-Z Masculinity (M)	-3.45	.004**

Table C-4. T-Test of Differences of Sample Means for Predictor Variables between Unsuccessful Service Managers (N = 41) and Unsuccessful Operations Managers (N = 17).
* Significantly different at the .05 level.

<u>VARIABLE</u>	<u>T-VALUE</u>	<u>2-TAIL PROB.</u>
AH51 Verbal Numeric Intelligence	-0.75	.456
AH52 Diagrammatic Intelligence	-1.49	.143
AH5 Intelligence Sum Score	-1.26	.213
Watson-Glaser Critical Thinking Appraisal	-1.18	.244
LOQ Consideration	-1.94	.057
LOQ Structure	-1.71	.093
G-Z General Activity (G)	-1.74	.087
G-Z Restraint (R)	-2.04	.047*
G-Z Ascendance (A)	-0.08	.938
G-Z Sociability (S)	-1.43	.157
G-Z Emotional Stability (E)	-0.49	.629
G-Z Objectivity (O)	-0.58	.564
G-Z Friendliness (F)	+0.01	.989
G-Z Thoughtfulness (T)	-1.18	.244
G-Z Personal Relations (P)	-0.29	.775
G-Z Masculinity (M)	-0.34	.737

APPENDIX D

Two-way Analysis of Variance of Predictor
Variables by Status and Function

Table D-1. Two-way Analysis of Variance of Predictor Variables by Job Function and Status (N = 74).

<u>VARIABLE</u>	<u>SOURCE OF VARIATION</u>	<u>F-VALUE</u>	<u>SIG.</u>	<u>DIRECTION</u>
AH51 Verbal Numeric Intelligence	Job Function	0.422	.518	
	Status	2.686	.106	
AH52 Diagrammatic Intelligence	Job Function	2.009	.161	
	Status	2.361	.129	
AH5 Intelligence Sum Score	Job Function	1.118	.294	
	Status	2.185	.144	
W-G Critical Thinking Appraisal	Job Function	1.575	.214	
	Status	1.510	.223	
LOQ Consideration	Job Function	5.680	.020	+Ops
	Status	3.687	.059	
LOQ Structure	Job Function	7.714	.007	+Serv
	Status	7.882	.006	+Succ
G-Z General Activity (G)	Job Function	2.037	.158	
	Status	4.419	.039	+Succ
G-Z Restraint (R)	Job Function	3.400	.069	
	Status	2.784	.100	
G-Z Ascendance (A)	Job Function	0.000	.988	
	Status	7.313	.009	+Succ
G-Z Sociability (S)	Job Function	0.459	.500	
	Status	2.284	.135	
G-Z Emotional Stability (E)	Job Function	0.266	.608	
	Status	3.929	.051	+Succ
G-Z Objectivity (O)	Job Function	0.625	.432	
	Status	0.003	.954	
G-Z Friendliness (F)	Job Function	0.078	.781	
	Status	4.992	.029	+Unsuc
G-Z Thoughtfulness (T)	Job Function	1.965	.165	
	Status	2.996	.088	
G-Z Personal Relations (P)	Job Function	0.002	.965	
	Status	2.878	.094	
G-Z Masculinity (M)	Job Function	2.749	.102	
	Status	2.895	.093	

APPENDIX E

Discriminant Function Analysis, All Variables,
and Stepwise,
of Predictor Variables, by Status and Function

Table E-1. Summary Statistics and Classification Results for Stepwise Discriminant Function Analysis of Service Managers by Status (i.e. Successful Service Managers vs. Unsuccessful Service Managers).

SUMMARY TABLE

<u>Variable Entered</u>	<u>Wilks Lambda</u>	<u>Significance</u>
LOQ Structure	.824608	.0022
G-Z Thoughtfulness (T)	.753904	.0011
G-Z Friendliness (F)	.686108	.0005
G-Z Personal Relations (P)	.621872	.0002
AH51 Verbal Numeric Intelligence	.601642	.0003
G-Z Masculinity (M)	.587889	.0004

CANONICAL DISCRIMINANT FUNCTION

Eigenvalue: 0.70100
 Wilks Lambda: 0.5878886
 Significance: 0.0004
 Canonical Correlation: 0.6419590

STANDARDIZED CANONICAL DISCRIMINANT FUNCTION COEFFICIENTS

AH51 Verbal Numeric Intelligence	- 0.24358
LOQ Structure	- 0.59016
G-Z Friendliness (F)	0.62383
G-Z Thoughtfulness (T)	0.63270
G-Z Personal Relations (P)	- 0.36430
G-Z Masculinity (M)	- 0.26674

CLASSIFICATION RESULTS

<u>Actual Group</u>	<u># of Cases</u>	<u>Predicted Group Membership</u>	
		<u>Successful</u>	<u>Unsuccessful</u>
Successful	10	8(80.0%)	2(20.0%)
Unsuccessful	41	7(17.1%)	34(82.9%)
Percent of Grouped Cases Correctly Classified:		<u>82.35%</u>	

Table E-2. Summary Statistics and Classification Results for Stepwise Discriminant Function Analysis of Operations Managers by Status (i.e. Successful Operations Managers vs. Unsuccessful Operations Managers).

SUMMARY TABLE

<u>Variable Entered</u>	<u>Wilks Lambda</u>	<u>Significance</u>
G-Z Restraint (R)	0.902687	0.1473
LOQ Structure	0.821131	0.1394
G-Z Sociability (S)	0.762444	0.1522
G-Z Ascendance (A)	0.675535	0.1149
G-Z Emotional Stability (E)	0.632530	0.1343
G-Z Objectivity (O)	0.525715	0.0742

CANONICAL DISCRIMINANT FUNCTION

Eigenvalue: 0.90217
 Wilks Lambda: 0.5257147
 Significance: 0.0722
 Canonical Correlation: 0.6886838

STANDARDIZED CANONICAL DISCRIMINANT FUNCTION COEFFICIENTS

LOQ Structure	-	0.97055
G-Z Restraint		0.81262
G-Z Ascendance	-	0.75082
G-Z Sociability		1.21314
G-Z Emotional Stability	-	1.01237
G-Z Objectivity		0.88472

CLASSIFICATION RESULTS

<u>Actual Group</u>	<u># of Cases</u>	<u>Predicted Group Membership</u>	
		<u>Successful</u>	<u>Unsuccessful</u>
Successful	6	6(100.0%)	0(0.0%)
Unsuccessful	17	3(17.6%)	14(82.4%)

Percent of Grouped Cases Correctly Classified: 86.96%

Table E-3. Summary Statistics and Classification Results for Discriminant Function Analysis (All Variables) of Service Managers by Status (i.e. Successful Service Managers vs. Unsuccessful Managers).

Canonical Discriminant Function

Eigenvalue: 0.99530
 Wilks Lambda: 0.5011773
 Significance: 0.0289
 Canonical Correlation: 0.7062738

Standardized Canonical Discriminant Function Coefficients

AH51 Verbal Numeric Intelligence Score	- 1.84449
AH52 Diagrammatic Intelligence Score	- 1.44046
AH5 Intelligence Sum Score	2.72030
Watson-Glaser Critical Thinking Appraisal	0.24722
LOQ Consideration	0.09856
LOQ Structure	- 0.45938
G-Z General Activity (G)	- 0.20958
G-Z Restraint (R)	- 0.17298
G-Z Ascendance (A)	- 0.03418
G-Z Sociability (S)	- 0.03100
G-Z Emotional Stability (E)	- 0.20302
G-Z Objectivity (O)	0.27390
G-Z Friendliness (F)	0.41075
G-Z Thoughtfulness (T)	0.68894
G-Z Personal Relations (P)	- 0.19551
G-Z Masculinity (M)	- 0.47277

Classification Results

<u>Actual Group</u>	<u># of Cases</u>	<u>Predicted Group Membership</u>	
		<u>Successful</u>	<u>Unsuccessful</u>
Successful	10	9(90.0%)	1(10.0%)
Unsuccessful	41	5(12.2%)	36(87.8%)
Percent of Grouped Cases Correctly Classified:		<u>88.24%</u>	

Table E-4. Summary Statistics and Classification Results for Discriminant Function Analysis (All Variables) of Operations Managers by Status (i.e. Successful Operations Managers vs. Unsuccessful Operations Managers).

Canonical Discriminant Function

Eigenvalue: 1.35178
 Wilks Lambda: .4252095
 Significance: .7131
 Canonical Correlation: .7581494

Standardized Canonical Discriminant Function Coefficients

AH51 Verbal Numeric Intelligence Score	-0.09011
AH52 Diagrammatic Intelligence Score	-0.07972
Watson-Glaser Critical Thinking Appraisal	-0.07498
LOQ Consideration	0.57834
LOQ Structure	-1.10505
G-Z General Activity (G)	0.38387
G-Z Restraint (R)	0.00507
G-Z Ascendance (A)	-0.82125
G-Z Sociability (S)	1.27483
G-Z Emotional Stability (E)	-0.99707
G-Z Objectivity (O)	1.05690
G-Z Friendliness (F)	0.30657
G-Z Thoughtfulness (T)	0.53411
G-Z Personal Relations (P)	-0.56432
G-Z Masculinity (M)	0.27768

Classification Results

<u>Actual Group</u>	<u># of Cases</u>	<u>Predicted Group Membership</u>	
		<u>Successful</u>	<u>Unsuccessful</u>
Successful	6	5(83.3%)	1(16.7%)
Unsuccessful	17	2(11.8%)	15(88.2%)
Percent of Group Cases Correctly Classified:		<u>86.96%</u>	

Table E-5. Summary Statistics and Classification Results for Stepwise Discriminant Function Analysis between Successful Managers by Job Function (i.e. Successful Service Managers vs. Successful Operations Managers).

SUMMARY TABLE

<u>Variable Entered</u>	<u>Wilks Lambda</u>	<u>Significance</u>
G-Z Masculinity (M)	0.541156	0.0039
LOQ Consideration	0.444669	0.0052
Watson-Glaser Critical Thinking	0.362936	0.0056

CANONICAL DISCRIMINANT FUNCTION

Eigenvalue: 1.75531
 Wilks Lambda: 0.3629360
 Significance: 0.0054
 Canonical Correlation: 0.7981629

STANDARDIZED CANONICAL DISCRIMINANT FUNCTION COEFFICIENTS

Watson-Glaser Critical Thinking Appraisal	0.60547
LOQ Consideration	-0.70002
G-Z Masculinity (M)	1.07550

CLASSIFICATION RESULTS

<u>Actual Group</u>	<u># of Cases</u>	<u>Predicted Group Membership</u>	
		<u>Service</u>	<u>Operations</u>
Service	10	9(90.0%)	1(10.0%)
Operations	6	0(0.0%)	6(100.0%)

Percent of Grouped Cases Correctly Classified: 93.75%

Table E-6. Summary Statistics and Classification Results for Discriminant Function Analysis (All Variables) between Successful Managers by Job Function (i.e. Successful Service Managers vs. Successful Operations Managers).

Canonical Discriminant Function

Eigenvalue: 59.31662
 Wilks Lambda: 0.0165792
 Significance: 0.0115
 Canonical Correlation: 0.9916758

Standardized Canonical Discriminant Function Coefficients

AH51 Verbal-Numeric Intelligence Score	-10.30222
AH52 Diagrammatic Intelligence Score	-15.82999
AH5 Intelligence Sum Score	5.64561
Watson-Glaser Critical Thinking Appriasal	16.54467
LOQ Consideration	-10.37275
LOQ Structure	- 4.98514
G-Z General Activity (G)	- 3.99469
G-Z Restraint (R)	- 0.54494
G-Z Ascendance (A)	0.38260
G-Z Sociability (S)	23.46355
G-Z Emotional Stability (E)	- 2.52969
G-Z Objectivity (O)	0.37365
G-Z Friendliness (F)	0.29646
G-Z Thoughtfulness (T)	11.65392

Classification Results

<u>Actual Group</u>	<u># of Cases</u>	<u>Predicted Group Membership</u>	
		<u>Service</u>	<u>Operations</u>
Service	10	10(100.0%)	0(0.0%)
Operations	6	0(0.0%)	6(100.0%)

Percent of Group Cases Correctly Classified: 100.0%

Table E- 7. Summary Statistics and Classification Results for Stepwise Discriminant Function Analysis between Unsuccessful Managers by Job Function (i.e. Unsuccessful Service Managers vs. Unsuccessful Operations Managers).

SUMMARY TABLE

<u>Variable Entered</u>	<u>Wilks Lambda</u>	<u>Significance</u>
G-Z Restraint (R)	0.931114	0.0465
LOQ Structure	0.867689	0.0202
G-Z General Activity	0.817795	0.0119
AH52 Diagrammatic Intelligence	0.755544	0.0044
LOQ Consideration	0.718603	0.0034
G-Z Sociability	0.694919	0.0037

CANONICAL DISCRIMINANT FUNCTION

Eigenvalue: 0.43902
 Wilks Lambda: 0.6949193
 Significance: 0.0037
 Canonical Correlations: 0.5523411

STANDARDIZED CANONICAL DISCRIMINANT FUNCTION COEFFICIENTS

AH52 Diagrammatic Intelligence	0.48219
LOQ Consideration	-0.49600
LOQ Structure	0.72755
G-Z General Activity	-0.46589
G-Z Restraint	-0.32981
G-Z Sociability	-0.38562

CLASSIFICATION RESULTS

<u>Actual Group</u>	<u># of Cases</u>	<u>Predicted Group Membership</u>	
		<u>Service</u>	<u>Operations</u>
Service	41	31 (75.6%)	10 (24.4%)
Operations	17	3 (17.6%)	14 (82.4%)
Percent of Grouped Cases Correctly Classified:		<u>77.59%</u>	

Table E-8. Summary Statistics and Classification Results for Discriminant Function Analysis (All Variables) between Unsuccessful Managers by Job Function (i.e. Unsuccessful Service Managers vs. Unsuccessful Operations Managers).

Canonical Discriminant Function

Eigenvalue: 0.56386
 Wilks Lambda: 0.6394430
 Significance: 0.1163
 Canonical Correlation: 0.600460

Standardized Canonical Discriminant Function Coefficients

AH51 Verbal Numeric Intelligence Score	0.15501
AH52 Diagrammatic Intelligence Score	-0.41412
Watson-Glaser Critical Thinking Appraisal	-0.27967
LOQ Consideration	0.57810
LOQ Structure	-0.72705
G-Z General Activity (G)	0.44119
G-Z Restraint (R)	0.40042
G-Z Ascendance (A)	-0.23927
G-Z Sociability (S)	0.63144
G-Z Emotional Stability (E)	-0.27189
G-Z Objectivity (O)	0.49433
G-Z Friendliness (F)	-0.05649
G-Z Thoughtfulness (T)	-0.10726
G-Z Personal Relations (P)	-0.33092
G-Z Masculinity (M)	-0.05909

Classification Results

<u>Actual Group</u>	<u># of Cases</u>	<u>Predicted Group Membership</u>	
		<u>Service</u>	<u>Operations</u>
Service	41	30(73.2%)	11(26.8%)
Operations	17	4(23.5%)	13(76.5%)

Percent of Grouped Cases Correctly Classified: 74.14%

Table E-9. Summary Statistics and Classification Results for Stepwise Discriminant Function Analysis of ALL Managers, Without Regard for Job Function, by Status. N = 74.

SUMMARY TABLE

<u>Variable Entered/Removed</u>	<u>Wilks' Lambda</u>	<u>Significance</u>
Ascendance (A)	.905064	.0076
LOQ - Structure	.867028	.0063
Thoughtfulness (T)	.810399	.0020
Friendliness (F)	.767681	.0010
Personal Relations (P)	.741480	.0009
Ascendance (A) (removed)	.752080	.0005
Emotional Stability (E)	.733283	.0006
AH51 - Verbal/Numeric Intelligence	.719488	.0009

CANONICAL DISCRIMINANT FUNCTION

Eigenvalue: 0.38988
 Wilks' Lambda: 0.7194878
 Significance: 0.0009
 Canonical Correlation: 0.5296341

STANDARDIZED CANONICAL DISCRIMINANT COEFFICIENTS

AH51	0.26283
LOQ - Structure	0.59626
Emotional Stability (E)	0.29720
Friendliness (F)	-0.62169
Thoughtfulness (T)	-0.50306
Personal Relations (P)	0.33007

CLASSIFICATION RESULTS

<u>Actual Group</u>	<u># of Cases</u>	<u>Predicted Group Membership</u>	
		<u>Successful</u>	<u>Unsuccessful</u>
Successful	16	11 (68.8%)	5 (31.3%)
Unsuccessful	58	10 (17.2%)	48 (82.8%)

Percent of Grouped Cases Correctly Classified: 79.73%

Table E-10. Summary Statistics and Classification Results for Discriminant Function Analysis (all variables) of ALL Managers, Without Regard for Job Function, by Status. N = 74.

CANONICAL DISCRIMINANT FUNCTION

Eigenvalue: 0.51551
 Wilks' Lambda: 0.6598426
 Significance: 0.0460
 Canonical Correlation: 0.5832301

STANDARDIZED CANONICAL DISCRIMINANT FUNCTION COEFFICIENTS

AH51 - Verbal Numeric IQ	-1.36756
AH52 - Diagrammatic IQ	-1.28107
AH5 Intelligence Sum Score	2.12426
Watson-Glaser Critical Thinking	0.19376
LOQ - Consideration	0.15022
LOQ - Structure	-0.53332
General Activity (G)	-0.11267
Restraint (R)	0.00444
Ascendance (A)	-0.28623
Sociability (S)	0.42577
Emotional Stability (E)	-0.36665
Objectivity (O)	0.31367
Friendliness (F)	0.48089
Thoughtfulness (T)	0.40637
Personal Relations (P)	-0.41601
Masculinity (M)	-0.06040

CLASSIFICATION RESULTS

<u>Actual Group</u>	<u># of Cases</u>	<u>Predicted Group Membership</u>	
		<u>Successful</u>	<u>Unsuccessful</u>
Successful	16	11 (68.8%)	5 (31.3%)
Unsuccessful	58	6 (10.3%)	52 (89.7%)

Percent of Grouped Cases Correctly Classified: 85.14%

APPENDIX F

Pearson Correlations for the
Sixteen Predictor Variables

Appendix F. Pearson correlations for the sixteen predictor variables.

	AH51	AH52	AH5 Sum	Wat Gla	LQQ Con	LQQ Struc	Gen Act	Restr	Ascend
AH51	1.0000	0.6247	0.8932	0.6329	-0.0277	-0.0326	0.2588	-0.1584	0.1581
AH52	0.6427	1.0000	0.9035	0.5095	-0.1172	-0.0550	0.3048	-0.2175	0.1052
AH5 Sum	0.8932	0.9035	1.0000	0.6173	-0.0504	-0.0474	0.3057	-0.1979	0.1435
Wat Gla	0.6329	0.5095	0.6173	1.0000	-0.0118	-0.1115	0.1821	-0.1641	0.0693
LQQ Con	-0.0277	-0.1172	-0.0504	-0.0118	1.0000	-0.0692	-0.0664	0.1748	-0.2122
LQQ Struc	-0.0326	-0.0550	-0.0474	-0.115	-0.0692	1.0000	0.1168	0.0919	0.3080
Gen Act	0.2588	0.3048	0.3057	0.1821	-0.0664	0.1168	1.0000	-0.0985	0.3570
Restr	-0.1584	-2.2175	-0.1979	-0.1641	0.1748	0.0910	-0.0985	1.0000	0.0244
Ascend	0.1581	0.1052	0.1435	0.0693	-0.2122	0.3080	0.3570	0.0244	1.0000
Sociab	0.0148	0.0474	0.0305	-0.0900	-0.1153	0.2903	0.4118	0.0146	0.6050
Emo Stab	0.1251	0.1759	0.1550	-0.0271	-0.0277	0.1388	0.3990	-0.0257	0.4797
Object	0.0898	0.0867	0.0970	0.0365	-0.1066	0.0052	0.1392	-0.0424	0.3280
Friend	-0.0208	-0.0808	-0.0453	-0.1351	0.1668	-0.1041	-0.1712	0.0740	-0.2406
Thought	-0.1275	-0.1920	-0.1643	-0.2458	0.2367	0.1985	-0.1772	0.6811	0.0133
Per Rel	0.1530	-0.0034	0.0589	0.1928	0.0841	0.0122	0.1710	-0.0525	0.2755
Mascul	0.1482	0.1783	0.1860	0.2115	0.0035	0.2128	0.1015	0.0178	0.3708

	Sociab	Emo Stab	Object	Friend	Thought	Per Rel	Mascul
AH51	0.0148	0.1251	0.0898	-0.0208	-0.1275	0.1530	0.1482
AH52	0.0474	0.1759	0.0867	-0.0808	-0.1920	-0.0034	0.1783
AH5 Sum	0.0305	0.1550	0.0970	-0.0453	-0.1643	0.0589	0.1860
Mat Gla	-0.0900	-0.0271	0.0365	-0.1351	-0.2458	0.1928	0.2115
100 Con	-0.1153	-0.0277	-0.1066	0.1668	0.2367	0.0841	0.0035
100 Struc	0.2903	0.1388	0.0052	-0.1041	0.1985	0.0122	0.2128
Gen Act	0.4118	0.3990	0.1392	-0.1712	-0.1772	0.1710	0.1015
Restr	0.0146	-0.0257	-0.0424	0.0740	0.6811	-0.0525	0.0178
Ascend	0.6050	0.4797	0.3280	-0.2406	0.0133	0.2755	0.3708
Sociab	1.0000	0.4669	0.2196	-0.2022	-0.0006	0.3319	0.3126
Emo Stab	0.4669	1.0000	0.5358	0.0665	-0.0435	0.3495	0.1431
Object	0.2196	0.5358	1.0000	0.3057	-0.0600	0.3898	0.2038
Friend	0.2022	0.0665	0.3057	1.0000	-0.1079	0.2027	-0.0648
Thought	-0.0006	-0.0435	-0.0600	-0.1079	1.0000	-0.1592	-0.0505
Per Rel	0.3319	0.3495	0.3898	0.2027	-0.1592	1.0000	0.3934
Mascul	0.3126	0.1431	0.2038	-0.0648	-0.0505	0.3934	1.0000

APPENDIX G

Definitions and Interpretations of the Predictor
Variables and of Shaw's Scale of
Task Structure

LEADERSHIP VARIABLESFROM THE LEADERSHIP OPINION QUESTIONNAIRE (LOQ)

(Fleishman, 1969)

The leadership Opinion Questionnaire (LOQ) provides measures on two dimensions of leadership attitudes.

CONSIDERATION (C)

Reflects the extent to which an individual is likely to have job relationships with his subordinates characterised by mutual trust, respect for their ideas, consideration of their feelings, and a certain warmth between himself and them.

- A high score is indicative of a climate of good rapport and two-way communication.
- A low score indicates the individual is likely to be more impersonal in his relations with group members.

STRUCTURE (S)

Reflects the extent to which an individual is likely to define and structure his own role and those of his subordinates toward goal attainment.

- A high score on this dimension characterises individuals who play a very active role in directing group activities through planning, communicating information, scheduling, criticizing, trying out new ideas, and so forth.
- A low score characterises individuals who are likely to be relatively inactive in giving direction in these ways.

PERSONALITY VARIABLESFROM THE GUILFORD-ZIMMERMAN TEMPERAMENT SURVEY (G-Z)

(Guilford & Zimmerman, 1949)

The Guilford-Zimmerman Temperament Survey (G-Z) provides ten personality trait scores. Each trait is expressed in terms of positive qualities (high scores) versus negative qualities (low scores).

High ScoreLow ScoreGENERAL ACTIVITY (G)

Rapid pace of activities, energy, vitality, keeping in motion, production, efficiency, liking for speed, hurrying, quickness in action, enthusiasm, liveliness.

Slow and deliberate pace, fatigability, pausing for rest, low production, inefficiency, liking for slow pace, taking time, slowness of action.

RESTRAINT (R)

Serious mindedness, deliberate, persistent effort, self-control.

Happy-go-lucky, carefree, impulsive, excitement-loving.

ASCENDANCE (A)

Self-defense, leadership habits, speaking with individuals, speaking in public, persuading others, being conspicuous, bluffing.

Submissiveness, habits of following, hesitation to speaking, avoiding conspicuousness.

SOCIABILITY (S)

Having many friends and acquaintances, entering into conversations, liking social activities, seeking social contacts, seeking limelight.

Few friends and acquaintances, refraining from conversations, disliking social activities, avoiding social contacts, shyness, avoiding limelight.

High ScoreLow ScoreEMOTIONAL STABILITY (E)

Evenness of moods, interests, energy, etc., optimism, cheerfulness, composure, feeling in good health.

Fluctuations of moods, interests, energy, etc., pessimism, gloominess, perseveration of ideas and moods, daydreaming, excitability, feeling in ill health, feelings of guilt, loneliness or worry.

OBJECTIVITY (O)

Being "thickskinned", less egoism, insensitivity.

Hypersensitiveness, egoism, self-centredness, suspiciousness, fancying of hostility, having ideas of reference, getting into trouble.

FRIENDLINESS (F)

Toleration of hostile action, acceptance of domination, respect for others.

Belligerence, readiness to fight, hostility, resentment, desire to dominate, resistance to domination, contempt for others.

THOUGHTFULNESS (T)

Reflectiveness, meditateness, observing of behaviour in others, interested in thinking, philosophically inclined, observing of self, mental poise.

Interested in overt activity, mental disconcertedness.

PERSONAL RELATIONS (P)

Tolerant of people, faith in institutions.

Hypercriticalness of people, faultfinding habits, criticalness of institutions, suspiciousness of others, self-pity.

High ScoreLow ScoreMASCULINITY (M)

Interest in masculine activities and vocations, not easily disgusted, hard-boiled, resistant to fear, inhibition of emotional expressions, little interest in clothes and styles.

Interest in feminine activities and vocations, easily disgusted, sympathetic, fearful, romantic interests, emotional expressiveness, much interest in clothes and styles, dislike of vermin.

WATSON-GLASER CRITICAL THINKINGAPPRAISAL

Critical thinking is defined as,

"a composite of attitudes, knowledge, and skills. This composite includes: (1) attitudes of inquiry that involve an ability to recognize the existence of problems and an acceptance of the general need for evidence in support of what is asserted to be true; (2) knowledge of the nature of valid inferences, abstractions, and generalizations in which the weight or accuracy of different kinds of evidence are logically determined; and (3) skills in employing and applying the above attitudes and knowledge."

The Critical Thinking Appraisal is composed of five subtests:

- (1) Inference: - ability to discriminate among degrees of truth or falsity of inferences drawn from given data.
- (2) Recognition of Assumptions: - ability to recognize unstated assumptions or pre-suppositions which are taken for granted in given statements or assertions.
- (3) Deduction: - ability to reason deductively from given statements or premises; to recognize the relation of implication between propositions; to determine whether what may seem to be an implication or a necessary inference from given premises is indeed such.
- (4) Interpretation: - ability to weigh evidence and to distinguish between (a) generalizations from given data that are not warranted beyond a reasonable doubt, and (b) generalizations which, although not absolutely certain or necessary, do seem to be warranted beyond a reasonable doubt.

- (5) Evaluation of Arguments: - ability to distinguish between arguments which are strong and relevant and those which are weak or irrelevant to a particular question at issue.

TASK MEASURESSHAW/FIEDLER SCALE

(From Fiedler, 1967, and Shaw, 1963)

The scale indicates the degree to which the task is capable of being programmed (is structured), or is unique, or ambiguous (is unstructured).

The instrument is based on four scales. These are:

DECISION VERIFIABILITY

The degree to which the correctness of the solution or decision can be demonstrated either by appeal to authority (e.g. the census of 1960), by logical procedures (e.g. mathematical proof), or by feedback (e.g. examination of consequences of decision, as in action tasks).

GOAL CLARITY

The degree to which the requirements of the task are clearly stated or known to the group members.

GOAL PATH MULTIPLICITY

The degree to which the task can be solved by a variety of procedures (number of different methods to reach the goal, number of alternative solutions, number of different ways the task can be completed).

SOLUTION SPECIFICITY

The degree to which there is more than one correct solution. (Some tasks, such as arithmetic problems, have only one correct solution; others have two or more, e.g. a sorting task where items could be sorted in several different ways; still others have an almost infinite number of possible solutions, e.g. human relations problems or matters of opinion).

- A high score indicates an unstructured, unique, ambiguous task.
- A low score indicates a task capable of being programmed, i.e. structured.

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