

AN EXPERIMENTAL VALIDATION AND EXTENSION
OF
FIEDLER'S CONTINGENCY MODEL OF LEADERSHIP EFFECTIVENESS

by

Sudhir Kumar Saha

B. Com. (Hons.) University of Rajshahi, 1965
M. Com., University of Rajshahi, 1966
M.B.A., Univerity of British Columbia, 1970

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Faculty
~~Department~~ of Commerce and Business Administration.

The University of British Columbia
Vancouver 8, Canada

Date SEPT. 12, 1972

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ABSTRACT

Fiedler's Contingency Model suggests that task-oriented leaders are more effective where the leadership situation is either very favourable or very unfavourable and that relations-oriented leaders are more effective in situations of intermediate favourability. This model was put here to an empirical test using three-man laboratory group performing either a structured or an unstructured task. An effort was also made to extend the model by investigating the effect of three new variables, namely, intelligence, ability and motivation as determinants of situation favourability for a leader. Based on earlier conjectures by Hill and Fiedler, it was predicted that the degree of intelligence and ability as well as the level of motivation of leaders and group members will determine how effective a leader would be in achieving higher group productivity.

One hundred and forty-seven Commerce undergraduate students of the University of British Columbia participated in the investigation. They were assigned to 49 groups of three people. One of the three people in each group was appointed as leader on the basis of a sociometric preference rating. Leadership situations were created by manipulating task structure, leader position power, leader member relations, intelligence, ability and motivation. Group productivity was rated using two criteria of performance - speed and quality of group decision. It was hypothesized that group decisions of higher quality and greater

speed will be associated with higher intelligence, ability and motivation of leaders and group members.

The results provided moderate support for the Contingency Model predictions in terms of direction and magnitude of correlations between leadership style and group productivity. Most of the correlations, however, failed to satisfy the test of statistical significance. In the extension part of the study, the results showed that (1) motivation significantly affected the speed of group decision and contributed to the leadership effectiveness; (2) intelligence of leaders and group members significantly affected both the quality and speed of group decision; (3) ability as operationally defined by a self-esteem measure did not influence either the speed or the quality of group problem solving; (4) motivation did not influence quality of group output.

On the basis of findings in (1), (2), (3) and (4) above, it was concluded that intelligence, motivation and perhaps ability should be incorporated in future studies of the Contingency Model as parameters of situation favourability.

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CHAPTER I

INTRODUCTION

One of the most perplexing problems confronting the manager as well as the behavioural scientist has been to determine the leadership style most conducive to promoting effective work groups. Leadership effectiveness and its relationship to productivity and satisfaction have been examined from the standpoints of traits, functions, styles and situations. The concept of leadership has been viewed anthropologically, economically, psychologically and sociologically, as well as from the vantage points of political power and experience. Despite the scope and magnitude of these efforts, we still know little about what makes one superior more effective than another or why a manager is effective in one situation and not in another.

Empirical studies directed toward finding that style which is most effective have yielded inconclusive and often contradictory results (e.g., Blake and Mouton, 1964; Fiedler, 1958; Lewin, Lippit and White, 1939; Likert, 1961; Shaw, 1955). Behaviour scientists have been amazed to find that both the directive, authoritarian, task oriented leader and his counterpart, the democratic, human relations leader have proved effective in countless situations.

The Contingency Theory of leadership effectiveness recently advanced by Fiedler (1964, 1967) suggests a theoretical explanation for the confusion which now exists in the literature and

the practical insights of many managers. Fiedler's theory suggests that leadership is an influence process where the ease or difficulty of exerting influence is a function of the favourableness of the group task situation for the leader. Although it has been recognised that the favourableness of each group task situation may depend on different variables, the three most commonly acknowledged determinants, stated in their order of importance are leader member relations, task structure and position power.

While the empirical basis from which the contingency theory was induced is impressive (over 50 studies of 21 different groups), validation studies of the theory have yielded mixed and confusing results. For example, Graen et al. (1971) found results contrary to the predictions of the contingency model. They made a distinction between antecedent and evidential probabilities. On the other hand, Fiedler and his co-workers reported results supporting the predictions of his contingency model.

The criticisms and counter criticisms of the research done on the contingency model leave the readers in confusion. Accordingly, the study reported here was designed to provide further empirical evidence on the contingency model. Three new variables were also examined to find out if they affect the so-called "leadership favourableness" dimension of the contingency model.

1.1 Research on Leadership Effectiveness: A Review

Modern psychological research on leadership is usually thought of as beginning with the Ohio State Leadership Studies (Hemphill and Coons, 1957; Halpin and Winer, 1957). The Ohio State investigators found from a factor analytical study of a 150-item questionnaire widely known as the Leadership Behaviour Description Questionnaire (LBDQ), two principal dimensions of leadership behaviour which they named 'consideration' and 'initiating structure'. Subsequently, scores of behavioural scientists have worked with the LBDQ and a related instrument, the Leadership Opinion Questionnaire (LOQ) attempting to identify the relative effectiveness of "Consideration" and "Initiating Structure" in a variety of situations. Two excellent reviews of this work have been reported by Korman (1966) and House (1972). Both reviews concluded that the research concerning these two styles of leader behaviour is inconsistent and yields contradictory findings. The correlation between the two leader behaviours on the one hand and subordinate satisfaction and/or productivity on the other, failed to reveal a clear pattern in one direction or another.

In another series of investigations, Katz et al. (1950, 1951) and Kahn (1951, 1956 and 1958) of the Survey Research Center at the University of Michigan studied railroad and insurance employees extensively and identified two leadership styles which they called "employee orientation" and "production orientation". Cartwright and Zander (1950) of the Research Center for Group Dynamics described leadership in terms of two

sets of group functions, "Group Maintenance" and "Goal Achievement". Mann (1965) offered a trilogy of "human relations", "technical" and "administrative" skills as required of effective supervisors. Likert (1961) found five conditions for effective supervisory behaviour in a study of insurance agents; supportive relations, group methods of supervision, high performance goals, technical knowledge and co-ordinating, scheduling and planning. Bowers and Seashore (1966) advanced a "Four Factor Theory of Leadership" based on four dimensions of leader behaviour which they named "support", "interaction facilitation", "goal emphasis" and "work facilitation".

Because of the diversity of terms and focus on different facets of the leadership process, it is difficult to meaningfully compare and assess the contributions of these various schools of thought. At the risk of oversimplification, it may be said that two dimensions of leader behaviour, that may be called "people" and "task" orientations, have attracted more attention from the various research groups than have any others. However, efforts to assess the relative importance of these two dimensions have yielded conflicting results. For example, while Katz and Kahn (1953), Argyle et al. (1958), Day and Hamblin (1964), Comery et al. (1954) and McGregor (1960) reported evidence in favour of a democratic, employee oriented general style of supervision; Hawkins (1962), Solem (1952), and Shaw (1955) found that autocratic task oriented leadership produced better performance. On the other hand, Morse and Reimer (1956), Spector and Suttel (1956), McCurdy and Eber

(1953), and Sales (1964) found no difference in terms of productivity between the two styles of leadership.

At the height of the confusion concerning the relative effectiveness of the two styles of leadership, researchers turned to situational variables in their efforts to explain the conflicting results coming from leadership research. Vroom and Mann (1960) argued that supervisory behaviour varied according to the size of organizational units. Fleishman et al. (1955) hypothesized that "organizational climate" moderated the relationship between leadership and productivity. Katz et al. (1961) suggested that the effectiveness of particular kinds of leadership practices would depend on variables such as the size of a company and the degree of urbanization of the company's location. Vroom (1964) has suggested further that the degree of acceptance which particular kinds of supervisory practices receive might be determined by the wishes and expectancies of the leader's subordinates and cites research by himself and others in support of this hypothesis. In his careful review of studies of the "consideration" and "initiating structure" dimensions, Korman favoured the introduction of situational variables into leadership research. In this regard, House (1971, 1972) has shown that rank and file employees prefer more structure than is preferred by scientists and technicians in research and development activities.

Most of the studies reviewed so far lacked an adequate conceptualization of the relevant variables and were carried on without the benefit of a comprehensive theory of leadership

phenomena. Further, investigators used measures suited to their own research interests and their choices frequently have precluded meaningful comparisons of results. Also, little attempt has been made to systematize the information necessary for identifying the social context within which groups operate. Consequently, it frequently has been impossible to tell whether findings from one study do or do not support the results of a purportedly similar study.

A review of leadership research is incomplete without considering the recent contributions made by Robert House and his associates (ref: 1971a, 1971b, 1971c and 1972). House, et al. advanced a "Path Goal Theory of Leadership" in their efforts to explain the confusing and contradictory findings from earlier research based on the dimensions of "consideration" and "initiating structure". For example, correlations between structure and subordinate performance were found to be consistently positive at high occupational levels while they were consistently negative at low occupational levels. House's Path Goal Theory explains this finding in terms of task structure. The theory hypothesizes that structure is positively related to higher level jobs because they are ambiguously defined. Lower level jobs, because of their routine nature, are negatively related to structure because any structure is perceived by employees as an "imposition of external control".

The Path Goal Theory of Leadership has been developed from Expectancy Theory (Atkinson, 1958), the Path Goal Theory of Motivation (Georgopoulos et al. 1957) and also extensions of both

Path Goal Theory and Expectancy Theory (Vroom, 1964; Porter and Lawler, 1967; Galbraith and Cummings, 1967; Graen, 1969 and Lawler, 1971). The Path Goal Leadership Theory specifies three classes of situational variables which are hypothesized to moderate the effects of specific dimensions of leader behaviour; subordinates' task characteristics, environmental variables, and subordinate preferences for different kinds of leader behaviour.

The Path Goal Theory has potential for explaining contradictory findings from earlier studies. By legitimate use of concepts from Expectancy and Motivation theories, it can also bring these theories closer to leadership theories and thereby enhance the predictive power of leadership theories. For example, in the Path Goal Leadership Theory a clearer link has been established between attempted influence of the leader and motivation and expectancies of the subordinates. At the present stage, however, House's theory is very general. It does not explain in any detail exactly how specific dimensions of leader behaviour are expected to interact with the moderators that are hypothesized nor does it identify specific characteristics of these moderators or how the theory may be operationalized.

Another recent contribution, on a more theoretical plane, has been made by Hollander et al. (1969) and Hollander (1971). Hollander provided an overview of several lines of development in the study of leadership. In his opinion, leadership should be viewed as an influence process growing out of a system of exchange relationships between the leader and the followers,

with the effectiveness of this relationship determined both by the leader's perception of his followers and by the followers' perception of the leader. This view of leadership phenomenon may reveal sources of identification or legitimacy of a leader's position or role.

Hollander's view of leadership effectiveness in terms of interaction of style, structure, and situation is not new. This line of work has been pursued for a long time by several researchers, and especially by Fiedler (1964, 1965, 1967). The formulation is novel in the sense that it opens up aspects of leadership processes such as sources of identification, legitimacy and influence systems which have not been systematically explored in previous research.

1.2 The Contingency Model of Leadership Effectiveness

Starting from an interest in the operational measurement of interpersonal relations, Fiedler (1964, 1967) studied various aspects of leadership for over 15 years. His Contingency Theory of Leadership was inductively derived from a program of 12 separate but related studies conducted over this lengthy period and has been offered as a partial answer to a number of the conceptual problems concerning leadership phenomena.

The Contingency Model states that a "group's performance will be contingent upon the appropriate matching of leadership style and the degree of favourableness of the group situation for the leader, that is, the degree to which the situation provides the leader with influence over his group members" (Fiedler

1967). The model assumes three variables, i.e., "position power", "task structure" and "leader member relations" as affecting leadership effectiveness.

Fiedler's theory of leadership effectiveness is intuitively appealing. The inductive reasoning behind the theory also appears reasonable. His research program not only upholds the position that leadership effectiveness is a joint product of style, structure, and situation, but also has explored the conceptually difficult phenomena of leadership in the field as well as in the laboratory with a fair sampling of actors, behaviours and behavioural contexts.

Unfortunately, the evidence in favour of the predictive power of the contingency model has been questioned (Graen et al. 1970, 1971). The evidential studies reported by Fiedler (1965, 1966, 1967), Hunt (1967), Mitchell (1969), Hill, (1969), and Graen et al. (1971) have obtained mixed results. Some of the results satisfy only directional rather than statistical significance; while some of the findings are contrary to what would be predicted by Fiedler's model. For example, in Mitchell's study of Unitarian Church groups, Hill's study of department stores and Graen et al's study of students in the laboratory at least a part of the results were contrary to those hypothesized by the Contingency Theory.

A very important flaw in the contingency model as brought out by Graen et al. (1970) is the model's extreme sensitivity to situational factors. This sensitivity encourages the investigators to ascribe any contrary findings from their invest-

igation to unaccounted situational factors. For example, Hill (1969) explained an insignificant result:

Since the work performed was of a highly technical nature, it may be that the technical ability of the Supervisor should have been a factor in the definition of the favourability dimension. The design of the study did not provide an opportunity to include this condition. (p. 516).

Again, Fiedler (1967) suggested:

We require a scale which is based not only on the presence or absence of good leader member relations, homogeneity, leader position power, and task structure but which takes account also of other factors that are likely to affect the favourableness of the situation. These may need to include the leader's and his member's intellectual abilities and technical qualifications, the motivation of the group, and the conditions of stress under which the group is forced to operate. (p. 262).

Every time Fiedler and his associates find a result either statistically insignificant or contrary to the model's prediction, they tend to explain the discrepancy in terms of some unidentified or uncontrolled situational moderators. This search for additional moderators may sometimes lead the investigator to experimenter bias effect. Graen et al. (1970) observed:

..... the Contingency Model overdetermines the 'meaningful' results of empirical studies the model prescribes that we should continue to search for additional homogenizing variables until our results converge upon those specified by the model. Once we have discovered the additional variable or variables that produce the 'meaningful' partitions (our observed results converge upon those predicted by the models), we should discontinue search and proclaim empirical support for the model. (p. 294).

According to Graen et al., this procedure produces experimenter bias effect (Barber and Silver, 1968a, 1968b; Rosenthal 1968).

Another exchange between Graen et al. and Fiedler centered on the question of methodology in testing the Contingency Model (Graen et al., 1971; Fiedler, 1971a). Fiedler argued that Graen's experimental manipulations of the relevant variables were not strong enough to produce the intended effects. In another review (1971b) Fiedler reported that there was a great discrepancy in results between laboratory and field studies on the Contingency Model.

Notwithstanding the possibility of weaknesses in Graen's manipulation of the contingency variables, it is difficult to accept the position that laboratory studies should not be able to replicate results obtained in field studies. If the ability of college students to assume functional roles is questioned, much of the small group research, past and present, would be brought into question (Davis, 1969). A theory which is method bound (in this instance limited to field studies) cannot be accepted. It was felt therefore, that further laboratory tests of the model were necessary with an improved methodology. The study reported here was designed to replicate the results found in the field studies.

As already noted, Fiedler defines situational favourability in terms of three variables: task structure, position power and leader member relations. Research based on Fiedler's model has measured position power in established groups by a simple eighteen

item checklist containing various indices of position power. Task structure has been measured by four of the ten dimensions used by Shaw (1963), i.e., decision verifiability, goal clarity, goal path multiplicity and solution multiplicity. Leader member relations have been categorized in terms of a Group Atmosphere (GA) Score, which purports to indicate the degree to which the leader feels accepted by the group and relaxed and at ease in his role (Fiedler, 1962).

Leader member relations, task structure and position power are dichotomized to form eight classifications (octants) of situational favourableness. The situational classifications with the predicted relationship between leadership style and performance as found in the antecedent studies of the Contingency Model are shown in Table I.

TABLE I

Median Correlation for the Development Studies
of the Contingency Model of Leadership

Situation Classification				More Effective Leadership Style (orientation)	Median \bar{r}	n
Octant (OCT)	Group Atmosphere (GA)	Task Structure (TS)	Position Power (PP)			
1	Good	High	Strong	Task	.52	8
2	Good	High	Weak	Task	.58	3
3	Good	Low	Strong	Task	.33	12
4	Good	Low	Weak	People	.47	10
5	Poor	High	Strong	People	.42	6
6	Poor	High	Weak	People	. .	0
7	Poor	Low	Strong	People	.05	12
8	Poor	Low	Weak	Task	.44	12

Research based on the Contingency Model has always measured leadership style by using a psychological test widely known as the Least Preferred Co-worker (LPC). The LPC has been subject to several interpretations. According to the most popular interpretation, low LPC scores mean "task orientation" while high LPC scores signify "people orientation". Chapter 2 of the study will take a closer look at the LPC.

According to Fiedler a task oriented leader will be effective in highly favourable (octants 1, 2, 3) or highly unfavourable (octant 8) situations; whereas a people oriented leader will be successful in situations of intermediate favourableness (octants 4, 5, 6, 7).

Because of limited number of subjects available the present study examined only a limited number of octants - octants 1, 4 and 8. A part of the study was concerned with testing the validity of the Contingency Model. The following proposition was used to test the validity of predictions of the model:

Hypothesis I: Task oriented leaders (low LPC) will be effective in octants 1 and 8, while people oriented leaders (high LPC) will be successful in octant 4. The correlation between the LPC score and group performance should be of the same magnitude and direction as predicted by the Contingency Model.

1.3 Motivation, Intelligence and Ability as Moderators of Leadership Effectiveness

The Contingency Model measures situational favourableness for a leader in terms of three variables - leader member relations, leader position power and task structure. The present

study, however, raised two separate issues related to such a definition of situational favourability. First, do the three variables adequately measure the situational favourableness parameter? Second, if leadership effectiveness is defined in terms of group productivity as is done in the Contingency Model, may we not conceive of other variables affecting group performance and thereby make a leader's task harder or easier?

Position power measures how much power (e.g., capacity to reward, hire and fire, etc.) a leader is given by the employing organization. Task structure measures whether the job is routine or a novel one. Leader member relations indicate the climate in the work group between the leader and the led. It requires but little imagination to conceive of other variables that may affect the favourableness of a leader's situation (for example, motivation, intelligence or ability).

The variables just named may affect leadership effectiveness, but then, so may many other variables. The question may be raised related to the criterion or criteria of choice - how does one go about adding or subtracting variables from a model? The question raised is relevant, but the answer may not be obvious at all. It is not possible to be certain that some variables are the only variables determining situational favourableness for a leader. Such a determination may well be beyond the original intent of the contingency model. Particular leaders will face particular leadership contingencies in terms of favourability of situation. The contingency model is not a bound model.

In at least two of the earlier studies on the Contingency

Model (Hill, 1969; Fiedler, 1967), the investigators felt that three more variables (intelligence, ability and motivation) may affect leadership effectiveness. These variables were thought to be responsible for explaining more of the variance in the situational favourableness dimension of the contingency model. Encouraged by such conjectures, the present study was designed to empirically test the effect of the three variables on leadership effectiveness, notwithstanding the fact that any contingency theory is always open to alternative explanations in terms of the adequacy of the situation explored. Accordingly, the following three hypotheses were accepted for testing.

Hypothesis II: All other things remaining the same, a leader of motivated groups will achieve higher productivity in terms of speed and quality of group decisions than will a leader of non-motivated groups.

Hypothesis III: Higher productivity in terms of speed and quality will be associated with leaders of groups with higher intelligence, all other group inputs remaining constant.

Hypothesis IV: A leader managing a group with higher ability will generate higher quality group decisions in a shorter time than will a leader managing a group of low ability, all other situational effects remaining the same.

1.4 Summary

In this chapter the development of enquiry concerning leadership effectiveness has been traced very briefly. Several lines of work were reviewed with special emphasis on two major

developments; the Path Goal Theory of Leadership and the Contingency Theory of Leadership Effectiveness. The controversial and conflicting nature of findings from the Contingency Model studies were mentioned briefly. The need for a further test of this model with an improved methodology was emphasized, and Hypothesis I of the present study, was stated. An extension of the "situational favourableness" parameter of the Contingency Model in terms of three more variables (motivation, ability and intelligence) also was proposed. The theoretical framework, arising from the works of Hill and Fiedler, supporting this kind of extension was briefly reviewed. Finally Hypotheses II, III and IV were proposed to describe the moderating effects of the three additional variables on leadership effectiveness.

CHAPTER 2

METHOD

2.1 Setting and Subjects

The investigation was carried out in the Small Groups Laboratory at the University of British Columbia. Subjects for the experiment were drawn from second year undergraduate Commerce classes in the Faculty of Commerce and Business Administration. Participation in the experiment was voluntary, but each subject earned some bonus points for his course by participating in the present experiment. There were 147 subjects divided into 49 groups of 3 people.

Procedure: The data collection for the present study was divided into two separate sessions: testing and experimental. In an approximately one hour long testing session the subjects were asked to complete the following questionnaires:

1. Wesman Personnel Classification Test.
2. Berger's Acceptance of Self Scale.
(Appendix I)
3. Sociometric Preference Rating of Group Members.
(Appendix II)
4. The Least Preferred Co-worker Scale (LPC).
(Appendix III)

The scores from tests No. 1 and 2 were dichotomized at the median to assign the subjects into various cells of the study. Data on the LPC were filed as soon as they were collected and were not considered until the end of the experiment and begin-

ning of the analysis of data. The Sociometric Preference Rating was used to create groups where the leader of the group was either liked or disliked by his fellow members. It was assumed that the assignment of subjects into experimental groups on the basis of a preference rating would manipulate group atmosphere. A group where the leader was preferred by his two other group members was assumed to have good leader member relations (high GA). The reverse was assumed to be true for the groups where a non-preferred person was appointed as the leader of the group.

In the experimental session, the pre-assigned subjects were brought to a Small Groups Laboratory which has two rooms (observation and experimental) separated by a two-way mirror. In two experimental conditions, namely, high motivation and strong position power, a reward of five dollars was attached to exceptional performance. In strong position power condition, the capacity to reward was entrusted with the leader. In high motivation condition, they were to be rewarded by the E. While the subjects sat around a table to do the assigned task, they were observed from the observation room by two observers, one of whom was the E himself.

As the experimental session progressed, the behaviour of the leader in interaction with two of his fellow members was observed carefully by the E and his assistant, both of whom independently completed the Leader Behaviour Rating questionnaire developed by Graen et al. (1971). The Leader Behaviour Rating

was a six-item rating form having 8-point bipolar adjectives like 'Permissive-Strict', 'Requesting-Ordering', 'Considerate-Rude' and so on. The nature and meaning of scores from the instrument were identical with LPC. Low scores indicated task orientation whereas high scores meant people orientation. According to Graen, comparison of scores between LPC and Leader Behaviour Rating would indicate whether LPC measured what it was supposed to measure. The validity of the Leader Behaviour Rating was unknown. Still, it provided an experimental check on the validity of the LPC scale.

At the end of the experiment, the leader of the group submitted a written solution for the problem the group was given to solve. These solutions were collected by E and evaluated later by two independent judges as to their quality. Rating was done on a 5-point Likert type scale for each of the four anchors (adequacy, issue involvement, exclusiveness and clarity of presentation) provided to the judges. Quality of solution was defined as the mean of the sum of scores obtained from the two independent judges.

After the solutions were collected, the subjects were asked to complete three post-experimental questionnaires: Group Atmosphere, Position Power and Motivation. The Group Atmosphere Scale (See Appendix VIII) was the same as used in earlier Contingency Model studies. Motivation and Position Power questionnaires (See Appendices VI and VII) were developed here. These questionnaires were completed by the subjects independently without any consultation. In the Group Atmosphere questionnaire they rated the

quality of interpersonal relations existing at the experimental session. The question on position power asked the co-workers of the leader to rate the power the leader had over the members. The question on motivation was answered by both the leader and his co-workers. All the members rated their state of motivation to do an effective job in the experiment.

The subjects were debriefed after they completed the questionnaires. In two experimental conditions, namely, 'strong position power' and 'high motivation', they were paid a 5-dollar bill as was promised to them at the beginning of the experiment.

2.2 The Measures: Their Reliability and Validity

To carry on the investigation of leadership effectiveness as conceived in the present study, measures were needed of task structure, position power, group atmosphere, ability, intelligence, motivation, leadership style and also measures of group output. The huge task of manipulation and measurement involved with so many variables deterred the investigator from developing original measures. However, every attempt was made to use measures with adequate reliability and validity. A description of the measures is given below:

Task Structure: As already mentioned in Chapter I, the degree of task structure was operationally defined by Fiedler (1967) in terms of four dimensions developed by Shaw (1963). These dimensions are: 1) goal clarity; 2) decision verifiability; 3) solution specificity; 4) goal path multiplicity. A structured task is defined as one which has a specific verifiable goal; that is,

one for which there are few alternatives to the solution. An unstructured task is vague, having no specific verifiable solution; this type of solution may be attained by pursuing a number of different courses of action.

The usual procedure adopted by Fiedler for measuring task structure is to obtain ratings of structure of a task from a number of independent judges. Moreover, he dichotomizes task structure by setting a cutting point of 5.0 on the mean rating over all the four scales. If the mean sum of judges' rating falls below 5.0, it is considered as a structured task. A task having a mean sum of rating 5.0 or above is considered unstructured.

For the purpose of the present experiment, the degree of task structure was manipulated by task selection from Taxonomy of Experimental Tasks (Shaw, 1963). Two tasks were selected from the book. Task 23 (See Appendix IV) having a mean rating of 3.73 was accepted as structured. Task 59 (See Appendix V) was regarded as unstructured, since it had a mean rating of 4.93 which falls close to the cutting point of 5.0. It is desirable to maximize the difference between mean rating of structure and the cutting point to increase the effect of task structure on group performance. Due to the non-availability of suitable tasks having highly reliable ratings on structure, task 59 was selected, although it was very close to the cutting point. Shaw found inter-rater reliability of .80 to .88 for his taxonomy of Task Structure. This was regarded as acceptable.

Position Power: In an ongoing group, position power was measured

in earlier studies of the Contingency Model by a simple eighteen item check list which provides various indices of position power. But, in an ad hoc group, position power must be provided by induction. Position power was defined for the present study as having two dimensions: 1) the capacity to reward the members of the groups; 2) some meaningful external symbol of status. Leaders having strong position power in the present experiment were given the power to reward group members with cash. They were also given the overall charge of carrying on the task. Additionally, they had an external symbol of status like a sign with the word "Chairman" in front of their seat. The E designated the leader as in charge of group operations in the presence of other group members. These special privileges and status were withheld from leaders of groups assigned to the weak position power experimental condition.

In order to learn whether the induction was effective in activating strong or weak leader position power, the participants were asked to complete a questionnaire at the end of the experimental session giving their perception of the leader's position power. The leader as well as his group members rated position power on a five-point scale. (Please see Appendix VI and Appendix VII).

An analysis was done to determine the mean perception scores in three octants of the Contingency Model. The results are shown in Table 2.

TABLE 2

Mean perception of group members
about leader position power

	Oct. 1 (strong)	Oct. 4 (weak)	Oct. 8 (weak)
Exp - A (Validation)	2.4 N=8	2.3 N=8	2.8 N=9
Exp - B (Extension)	3.0 N=8	2.5 N=8	2.7 N=8

The overall mean for strong power condition was 2.7, whereas the same for weak condition was 2.4. This will suggest that the induction worked very slightly, since the difference was only .3 on a 5-point scale. This inability to induce strong position power supports Fiedler's contention that it is very hard to manipulate position power satisfactorily in a laboratory situation.

Leader Member Relations:

Both in ongoing and ad hoc groups the quality of leader member relations was measured in past Contingency Model studies by an instrument called Group Atmosphere (GA). The GA is highly related to the group members' loyalty to the leader (McNamara, 1967) since it measures only the leader's perception of group atmosphere. Leader member relations is one of the crucial variables affecting situational favourableness, according to Fiedler.

The GA score has obtained in previous studies from a set of scale items (number of items varying between ten and seventeen) asking the leader to rate his group on a series of bipolar items such as friendly-unfriendly, cooperative-uncooperative, tense-relaxed, etc. (Appendix VIII). "A summation of the item scores yields a quite reliable and meaningful Group Atmosphere score, which indicates the degree to which the leader feels accepted by the group and relaxed and at ease in his role". (Fiedler, 1967).

One criticism to which the GA score has been subjected is the fact that it may be confounded by group performance (Graen et al. 1970). For example, the high or low performance of a group may influence the leader's perception as to the kind of relation he had with his group members. In an established department noted for high performance the boss may find it difficult to admit that his influence on the group was minimal.

To minimize the likelihood of this criticism it was decided for the purpose of the present experiment that the group atmosphere would be created by some kind of manipulation in addition to measuring it after the experiment was over. This effort was possible because the subjects for the experiment were drawn from a class where they had previously worked together for five to six weeks. The plan involved devising a sociometric preference rating where the subjects were asked to mention which members of the class he would like as his workmates. (See Appendix II). Subjects were assigned to groups in a fashion where a preferred subject would be given the position of leadership in a

group where he was liked by his workmates. It was assumed that this procedure would enable the leader to have some influence on his workmates. Where poor leader member relations were desired, the group was constituted of members who did not prefer each other. The assumption in this case was that the non-preference of the leader by group members would reduce the leader's influence over the group.

To check whether the manipulation of group atmosphere was successful, the leaders as well as the group members were asked to complete the ten item G A Scale developed by Fiedler. These data were analyzed to determine the difference of G A scores between the conditions of good and bad leader member relations. Table 3 shows the results:

TABLE 3

Mean G A scores for conditions
of good and poor leader member relations
(Based on the leader perception)

Experiment	Good		Poor
	Oct. 1	Oct. 4	Oct. 8
Exp - A	68 (N=8)	67 (N=8)	66 (N=9)
Exp - B	64 (N=8)	67 (N=8)	61 (N=8)
Overall	68.6		63.5

The overall Mean Group Atmosphere scores for the condition of leader member relations was 68.6 while that for the condition of poor leader member relations was 63.5.

From the above Table, it appears the manipulation of leader influence by sociometric preference rating was successful to a certain extent. But the small difference between the two means suggests that the manipulation failed to achieve a significant difference between good and poor leader member relations.

The small difference in group atmosphere in terms of G A scores may be due to two reasons: first, the degree of manipulation of group atmosphere by way of subject assignment was not strong enough, or, alternatively, the G A scale as developed by Fiedler did not adequately measure the quality of leader influence. The second explanation seems plausible in view of the following observation by Allan B. Posthuma (1970):

The G A scale produces some interesting comparisons. In comparison to laboratory groups, real life groups have somewhat lower item means (not significant) and significantly greater variance ($F=3.61$, $p .01$). This difference can probably be attributed to the artificial nature of laboratory groups where it would be difficult to develop strong negative feelings and where the attitude toward the group would produce any severe differences in opinion among group members. In a laboratory group, members are aware of the temporary nature of the experience and are involved with tasks they know will last only for a certain length of time. This is not the case in real life situations, where members hold their jobs for a variety of reasons, and where tensions build up over a considerable period and a complex series of experiences. (pp. 10-13).

If the vulnerability of the G A scale in measuring group atmosphere in laboratory groups as brought out by Posthuma is granted, it is to be expected that the difference of G A scores between the two good and poor conditions created in the present experiment will be small, no matter how strong the degree of manipulation by the experimenter. No matter which of the two reasons are accepted for the smaller mean difference between the two conditions of the present experiment, it appears that the manipulation of leader member relations in a laboratory experiment will remain a hard task to accomplish.

Motivation: It has been demonstrated repeatedly that this variable may be manipulated by providing some incentive for effective performance. What provides an adequate incentive irrespective of individual differences is, of course, subject to debate. However, both theory and empirical studies support the effectiveness of cash as an effective incentive for higher performance. There is a well documented body of research which indicates that cash has convertibility to other valued psychic and material outcomes (e.g., Whyte, 1955; Lawler, 1971).

Subjects were assigned to two different motivational conditions; high and low. The subjects in the high motivation condition were told at the beginning of the experimental session by E that each of the group members would receive a cash prize of five dollars for reaching decisions of higher quality in the minimum possible time. No time limit was given. They were told to minimize time and maximize quality. Whether their decision

satisfied the requirement of quality and time, was left to the discretion of the experimenter. In the case of subjects under the low motivation condition no incentive was given. They were told only to minimize time and maximize quality as best they could. They were not promised any reward for doing so.

To find out whether the manipulation of high and low motivation conditions as devised by the above experimental procedure was successful, each subject was asked to rate his motivation on a 5-point scale. (See Appendices VI and VII for the rating form). Table 4 shows the mean ratings:

TABLE 4

Mean of the Subjects' Rating of Their Motivation

Octants	High Motivation	Low Motivation
	N=12	N=12
1	4.33	4.17
4	4.75	2.58
8	4.66	2.58
Mean over octants	4.58	3.11

From the above Table it appears that the manipulation with respect to motivation was quite successful with the exception of the groups in the octant 1 experimental condition. A differ-

erence of (4.58 - 3.11) 1.47 scale points on a 5-point scale may be considered satisfactory given the short term duration and artificiality involved in the experiment.

Ability: Vroom (1964) defines a person's ability to perform a task as "... the degree to which he possesses all the psychological attributes necessary for a high level of performance, excluding those of a motivational nature". (p. 198). To Porter and Lawler (1968) abilities are "... relatively stable long term individual characteristics (e.g., personality traits, manual skills, intelligence, etc.), that represent the individual's currently developed power to perform". (p. 22).

Pursuing these two definitions a little further, one may argue that a test having relevance to an individual's capacity for effective performance may be used as a measure of ability. The problem, however, is how many tests to use? One? Two? One hundred? What has been the experience with such tests in the past? Campbell et al. (1970) showed that the predictive validity of such tests rarely exceeds .40. Mitchell (1971) feels that an operationally satisfactory definition of task related abilities has been elusive.

Ability was operationally defined for the purpose of the present experiment as the individual's overall capacity for effective functioning in a given environment. This capacity was assumed to be strongly influenced by an individual's self concept or degree of self esteem as acquired through a series of successes or failure in tasks performed over a long period of

time. Kaufman (1962), Vroom, (1961, 1962, 1964) and Lawler, (1971) have provided empirical evidence that an individual's level of performance tends to vary with the degree of self esteem he possesses.

Self esteem is usually considered to be more a personality characteristic than a task related ability. Notwithstanding, self esteem was used in the present study because of the following considerations: 1) although not task related, self esteem does influence a person's overall capacity to cope with his environment. Thus it may be argued that this measure of ability is more comprehensive (in the macro sense of the term) than any other task related ability measure; 2) given that the principal purpose of the present study was not to develop predictors for effective performance, a workable measure like self esteem was considered acceptable; 3) considering the tasks that were used in the present experiment, it appeared almost impossible to come up with a workable number of predictors. A combination of predictors could be used but at the cost of an overly complex design.

Several measures of self esteem were considered, and that developed by Berger (1952) was selected for use in the present investigation. This measure is one of the most carefully developed measures of attitude toward self with reliabilities ranging from .776 to .884 (split half reliability for five groups). Validation of the scale scores against judges' ratings on self acceptance yielded a correlation of $r = .897$.

Berger's self acceptance measure consists of 36 attitude

statements (both positive and negative) which the respondents rate on a 5-point Likert type scale. When scoring, the answers to negatively worded statements are reversed. The scores on all statements are added together to obtain a scale score. The higher the score the better the respondent's self esteem and vice versa. The scores for the 72 subjects for Exp - B were distributed normally, with a range of 105 - 162, and a median of 138.

The subjects were divided at the median score for assignment into high and low ability groups. Subjects scoring up to 138 were considered as having low self esteem, and those scoring beyond 138 were classified as having high self esteem.

Intelligence: General mental ability or intelligence is a multi-dimensional concept. Two dimensions which were considered important for the present experiment were: verbal reasoning and numerical ability. Proficiency in reasoning and numerical capacity were necessary to do an effective job in the problems that were chosen for the present study. An intelligence measure which directly filled this need was the Wesman Personnel Classification Test. The test has consistently produced reliabilities in the upper 80's. It correlated well with other reputable tests such as the Otis General Intelligence Examination ($r = .68$), and the Wonderlic Personnel Test ($r = .76$). The test has been used with subjects in a number of different occupations and settings ranging from university students to mechanical apprentices.

A few words are in order about the structure of the test. Items used to measure verbal reasoning ability were designed to fulfill certain requirements. Both reasoning through analogy and perception of relationships are needed to respond to each item. At the same time, the form permits the use of a wide variety of subject matter and a consequent reduction of emphasis on mere vocabulary knowledge. The chances of guessing correct answers are only one in sixteen, as against one in four or five for more multiple choice tests; this considerably increases the reliability of the individual items. Although timed, the test is essentially a measure of power rather than of speed.

The numerical items have been devised to test command of basic arithmetic skills and processes plus general facility in the use of numerical concepts. The content has been so arranged that a premium is placed on the ability to perceive relationships and to operate with ingenuity; the importance of sheer figure handling speed, or number perception, better measured by simple clerical tests is minimized. There are no trick questions; however, some problems are included which are easy for a person with a ready understanding of principles and relationships involved. This test combines power and speed of performance.

The characteristics of the WPCT just mentioned were essential for doing a good job in the tasks selected for the present experiment. For example, one of the tasks required the subjects to assign five people to five machines using time and motion

study data about the whole operations. To make an effective assignment a command of arithmetic skills and reasoning ability are essential. The WPCT measured these mental capacities.

A total of 147 subjects were administered this test but only 72 were used in the Exp - B part of the study. Their scores ranged from 20 to 54 with a median of 43. Subjects were assigned based on a cutting score of 43. Subjects scoring 43 or more were considered to possess 'high' intellectual capacity, and those who scored less than 43 were considered 'low' in intelligence.

Leadership Style: This variable was measured by the LPC instrument developed by Fiedler. The LPC score is obtained by asking a person to think of all the individuals with whom he has worked. He then describes the person whom he considers his least preferred co-worker. The descriptions are made on 8-point, bi-polar adjective check lists, similar in form to Osgood's Semantic Differential (Osgood et al., 1957), using items descriptive of personality attributes, e.g:

Friendly:	8 : 7 : 6 : 5 : 4 : 3 : 2 : 1:	Unfriendly
Co-operative:	8 : 7 : 6 : 5 : 4 : 3 : 2 : 1:	Uncooperative
Cold:	1 : 2 : 3 : 4 : 5 : 6 : 7 : 8:	Warm.

(~~Please~~ see Exhibit III for the LPC instrument used).

According to Fiedler, 1967):

... the Least Preferred Co-worker score, LPC, is an almost ideal psychological measure. It takes no more than 5 minutes to administer; it consists of a short set of scale items (usually 16 to 20);

has split half reliability of above .90, a test retest reliability for adults ranging from .5 to .8; and it arouses little if any resistance on the part of subjects.

On the other hand, the LPC score has been extremely resistant to any meaningful interpretation despite a persistent and intensive effort which has extended over nearly two decades. LPC has been uncorrelated with most personality test scores and various attempts to relate the score to self descriptions, descriptions by others, or behavioural observations have led to complex or inconsistent results.

The LPC score has been interpreted differently over periods of time. First it has been suggested that LPC is a simple measure of leadership style, e.g., high LPC leaders are relationship oriented, low LPC leaders are task oriented (Fiedler, 1967). However, standard measures of leadership style such as Initiation of Structure or Consideration have failed to correlate consistently with LPC (Fiedler, 1971). Accordingly, Fiedler (1970) in a technical report from the University of Washington gave a new interpretation of the LPC score. He re-analyzed most of his leadership studies and observed:

... the Least Preferred Co-worker (LPC) score ... suggests that the score reflects a hierarchy of goals. High LPC persons have as their primary goal the establishment and maintenance of interpersonal relations and as a secondary goal the attainment of prominence and self enhancement. The low LPC person is seen as having as his primary goal the achievement of task and material rewards while he has as his secondary goal the development of good interpersonal relations. The individual will seek to achieve his primary as well as secondary goals in situations in which his control and influence

is relatively great; he will concentrate on securing his primary goals in situations which are unfavourable and stressful. (Abstract to the Report).

A few other interesting interpretations of the LPC score are available. In a series of analyses, Mitchell (1970) has presented evidence suggesting that LPC measures cognitive complexity; high LPC subjects make greater distinctions between stimulus objects than the low LPC persons. Thus, low LPC leaders are effective in very favourable or very unfavourable situations, because of the fact that the situations are cognitively simple (e.g., either favourable or unfavourable). But the high LPC leaders because of their higher capacity to differentiate between stimulus objects become successful in situations of intermediate favourableness (cognitively complex).

Sample and Wilson (1965) found that high and low LPC leaders showed a similar amount of initiation of structure over the duration of a small group task experiment. But, the patterns of behaviour shifted as the task neared completion. Fiedler interpreted this finding in terms of a stress/non-stress difference in the situation. In a recent study by Evans et al. (1972), the authors observed:

The research reported here suggests an alternative explanation. It has been found that low LPC was consistently an indicator of cognitive simplicity in that it was associated with high dogmatism and with high intolerance for uncertainty. However, the high LPC individual could be one of several types: a) cognitively complex -- undogmatic but uncomfortable with uncertainty; b) cognitively mixed -- i: undogmatic but uncomfortable with uncertainty, ii: dogmatic but comfortable with uncertainty. (p. 18).

On the basis of the above evidence the authors suggested that LPC may not be a measure of cognitive complexity as earlier research showed it to be.

The LPC scale is an integral part of any study on the Contingency Model of Leadership Effectiveness, but the LPC as a measuring instrument still appears to be uninterpretable or subject to several interpretations. Considering this, it was decided to use the instrument at its face value. A plan was, however, made to check the validity of the LPC scale in terms of observation and rating of the behaviour of leaders in the experiment. Two observers independently rated the behaviour of the leaders in each group using the Leader Behaviour Rating instrument developed by Graen et al. (1971). This rating form has six bipolar adjectives similar in form to the LPC scale, a low rating meaning that the leader is observed to be task oriented, a high rating indicating the people orientation. (Appendix X). One problem faced in using the Leader Behaviour Rating was lack of any reliability information about the instrument. To overcome this, inter-rater reliability was computed between two sets of ratings done by the two independent observers. Table 5 shows various correlational values between the two ratings.

TABLE 5

Inter-correlation between the ratings
of two observers on:
(N=35)

Item #1	$r = .04$
Item #2	$r = .31$
Item #3	$r = .86$
Item #4	$r = .42$
Item #5	$r = .66$
Item #6	$r = .71$
TOTAL	$r = .76$

Since the inter-rater reliability on the individual items varied from a low of .04 to .86 with a median of .54, it was decided not to use these for further analysis. But, the inter-rater reliability on the sum of ratings was .7562. This was considered acceptable with caution.

A correlational analysis was carried on the LPC scores and the ratings of leader behaviour as submitted by two independent observers. Four sets of observations were used: (1) rating sum from observer No.1; (2) rating sum from observer No.2; (3) mean of ratings from both observers; (4) LPC scores. Table 6 shows the result of the analysis.

TABLE 6

Inter correlation between observer rating of leader behaviour and Least Preferred Co- worker scores	
(N=35)	
Observer #1	$r = .07$
Observer #2	$r = .12$
Mean of rating from #1 and #2	$r = .08$

It is difficult to interpret the low correlation between the LPC scores and observer rating of leader behaviour. The low correlational values indicated that there was little association between leadership style as predicted by LPC and that the two observers rated as the demonstrated behaviour of the leader. But any strong doubt on the validity of the LPC in terms of the rating by observers would be unwarranted since the validity of

the instrument (the Leader Behaviour Rating as developed by Graen) used was unknown.

Group Productivity: Solutions from the two group tasks were scored using two criteria (i.e., quality of solution and time taken to reach the solution) as was suggested by the authors of the tasks. As mentioned in the section on experimental procedure, time for solution was recorded by the experimenter. The quality of solution was rated by two independent judges in the case of task 59 (unstructured): for task 23 (structured) the quality of solution was measured according to the instruction provided by the author of the task.

Task 23 was an assignment problem where the groups were asked to assign as efficiently as they could five men to five machines. The assignment was to be done according to a time and motion study data provided to the group. There was one best solution for the problem and this was ten minutes. The worst solution could be fifteen minutes. Since the result provided by various groups varied between ten and fifteen minutes, it was decided to rate the quality of the output on a 10-point scale. Accordingly, groups that came up with a solution of ten minutes got rated as perfect (10 points); whereas the group deciding on a 15 minute solution was rated as wrong (0 points).

Task 59 was a discussion task in which the group members were asked to figure out the five most important traits needed for success in a culture. It was very difficult to define the criterion 'quality', because there was no 'the solution'. The

author of the task did not have any rating instructions on this criterion. It was therefore decided to develop our own rating form. This was done as described below.

Quality was defined as the sum of ratings on the four anchors of: 1) adequacy (how adequate the five traits are for attaining success): 2) issue involvement (how relevant the solution is to the problem): 3) exclusiveness (defined as independence of the listed traits from one another): 4) clarity of presentation (defined as clarity of expression).

A rating form was created where two judges were asked to rate each of the group solutions independently on a 5-point Likert type scale using the four anchors as described. (Please see Appendix IX).

The two judges were doctoral students in Organizational Behaviour at the University of British Columbia. Before they were assigned to the rating job, they were invited to a joint session with the E for briefing and trial. The meaning of the anchors was explained to them. After a reasonable agreement had been reached on the meaning of anchors, the judges were asked to make a few trial ratings.

At the end of the briefing and practice sessions, the judges went home with the group solutions which were printed on a separate piece of paper. (Solutions were printed to avoid the rating bias arising from the quality of handwritten solutions). Rating was done privately and independently.

When all the ratings were received from the two judges, an inter-rater reliability was computed. Table 7 shows the

inter-rater agreement on each of the four anchors as well as on the sum of scores:

TABLE 7

Inter-rater Agreement on the Ratings
of Group Output

(N=47)

<u>Rating Anchor</u>	<u>Reliability</u> (r)
1. Adequacy	.75
2. Issue Involvement	.68
3. Exclusiveness	.80
4. Clarity of Presentation	.50
5. Sum of the Anchors	.74

Inter-rater reliability on the sum of scores ($r = .74$) was considered satisfactory. All further analyses were done on the sum of scores.

2.3 Description of the Statistical Procedure

Hypothesis I was concerned with testing the earlier predictions from the Contingency Model. Three steps were involved in the test: 1) convert the scores on the LPC and Group Productivity into ranks; 2) compute the Spearman Rank Order Correlation between the two ranks; 3) compare the rho's found in the present study with those from the model. A test of significance was done. The .05 level of significance was accepted as the basis for rejecting the null hypothesis.

Hypotheses 2, 3 and 4 respectively were to test the moderating effect of motivation, intelligence and ability on leadership effectiveness. Each of the three variables had two levels and the resulting experimental design was a 2 x 2 x 2 factorial. This design facilitated two important analyses; 1) three-way analysis of variance and; and 2) a covariance analysis.

In the three-way ANOVA the objective was to determine the main and interaction effects of the three proposed moderators on group performance. The statistical model was of the form:

$$Y = A(i) + B(j) + C(k) + D(l) + AB(ij) + AC(ik) \\ + BC(jk) + ABC(ijkl) + E$$

where:

A = Intelligence, B = Ability, C = Motivation,

D = Replication, i = 1,2 j = 1,2 k = 1,2

l = 1,2,3 Y = Group Performance.

In the analysis of covariance, the objective was to determine if the three proposed variables did indeed moderate the relationship between the LPC and Group Productivity. Accordingly, the following covariance model was used where LPC was the covariate:

$$Y = A(i) + B(j) + C(k) + \text{LPC} + E$$

where:

Y = Group Output

A = Intelligence

B = Ability

C = Motivation

E = Error

i = 1,2

j = 1,2

k = 1,2

Results from the three-way ANOVA and analysis of covariance

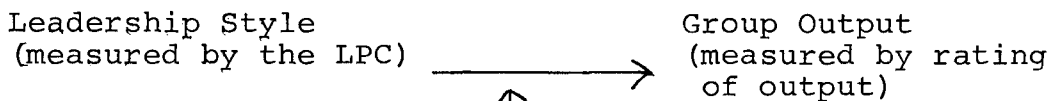
were subjected to a test of significance at the .10 level of confidence.

2.4 Description of the Experimental Design

The reader may recall from Chapter I that the present investigation was concerned with two prime objectives; one, to test the Contingency Model with an improved methodology and design; two, to ascertain whether the variables of motivation, intelligence and ability would indeed moderate the relationship between leadership style and group productivity as earlier theorists predicted. In order to satisfactorily carry out the investigation of the two research questions, an experimental design consisting of two parts was conceived. One part of this design was to validate the Contingency Model, the other, to examine the moderating effects of motivation, ability and intelligence in combination with the three original variables of the Contingency Model of leadership effectiveness. The overall design and that of the two separate parts was as follows:

Design

Overall:



Situational Variables:

Part I (1. Task Structure (TS)
(2. Position Power (PP)
(3. Leader Member Relations (GA)

Part II (4. Intelligence (INT)
(5. Ability (SE)
(6. Motivation (MOT)

According to the Contingency Model, the situation moderates the relationship between leadership style and group outcome. The overall design, therefore, consisted of assigning groups to laboratory created situations on the basis of the variables under examination, measuring the leadership style of the particular leader, and the output of the particular group. The broken line above separates the variables under examination (4, 5, 6) in the present study from those contained in the Contingency Model (1, 2 and 3). The situational variables were dichotomized to provide different combinations of degrees of task structure, position power, quality of leader member relations, levels of ability, intelligence and motivation. Leaders were assigned to groups. The covariation between leadership style and group productivity provides evidence for the predictive power of the Contingency Model. The two parts of the overall design which will be referred to as Experiment A and Experiment B, were as described below:

Experiment A:

This part of the design was concerned with testing the Contingency Model. Attempts were made to create leadership situations as close to the Model as possible. Methodological criticisms by Graen et al. (1971) and Fiedler (1971) were kept in mind in manipulating the different situational variables. In particular, care was taken that the strength of manipulation of variables such as position power and leader member relations were not diluted. This point has been elaborated earlier in Section 2.2 of this Chapter.

The Contingency Model contains eight cells derived by a 2 x 2 x 2 breakdown of the three situational moderators (TS, PP and GA). Leaders are hypothesized to be effective or ineffective depending on the situational octants to which they are assigned and also their LPC scores. For example, leaders with low LPC scores (meaning task orientation) may be more effective in octants 1, 2, 3 and 8 whereas leaders with high LPC scores (meaning people orientation) are predicted to be more effective in octants 4, 5 and 7.

Research on the Contingency Model has a limitation in terms of the number of subjects required because observations are made on the basis of groups rather than on the basis of individuals in the groups. Facing this constraint, it was decided to test only three octants of the Contingency Model. These octants are described in Table 8.

TABLE 8

Design for Experiment A

Octant	Situational Measures			Effective Leadership Style	N = No. of Groups	Performance
	GA	TS	PP			
Oct. 1	Good	High	Strong	Task (low LPC)	8	Group product
Oct. 8	Poor	Low	Weak	Task (low LPC)	8	Group product
Oct. 4	Good	Low	Weak	People (high LPC)	8	Group product

Experiment B:

This experiment was concerned with examining the moderating effects of three new variables for the Contingency Model. The three proposed variables (intelligence, ability and motivation) were dishotomized into high and low. This provided eight different combinations. Nesting the three Contingency Model variables in each of these eight new combinations resulted in the following design, as shown in Table 9.

TABLE 9

Design for Experiment B					
Intelligence (Int.)					
HIGH		LOW			
Ability SE					
MOTIVATION (MOT)	High	Low	High	Low	
	High	Int-High SE -High Mot-High (TS,PP,GA)	Int-High SE -Low Mot-High (TS,PP,GA)	Int-Low SE -High Mot-High (TS,PP,GA)	Int-Low SE -Low Mot-High (TS,PP,GA)
	Low	Int-High SE -High Mot-Low (TS,PP,GA)	Int-High SE -Low Mot-Low (TS,PP,GA)	Int-Low SE -High Mot-Low (TS,PP,GA)	Int-Low SE -Low Mot-Low (TS,PP,GA)

Since the new variables were superimposed on the octant conditions (1, 4 and 8) as hypothesized by the Contingency Theory, there were twenty-four cells of observations, eight observations for each of octants 1, 4 and 8. This design made it possible to do analysis of variance and covariance to determine the effects of the three variables on the three octants of the Contingency Model.

CHAPTER 3

RESULTS

3.1 INTRODUCTION

In this chapter the data relevant to the four hypotheses of the study are examined. Hypothesis I was concerned with a test of the validity of the predictions of the Contingency Model. This test was done by the assignment of leaders into different octants of the model indicating different degrees of situational favourableness and computation of covariation between the LPC scores of the assigned leader and group productivity. Both the LPC scores and group productivity scores (derived by panel rating) were converted into ranks. The Spearman Rank Order Correlation was computed between the two ranks. The correlation found was tested for significance at the .05 level. Finally, the results were compared with the earlier predictions.

Hypotheses II, III and IV, which examined the moderating effects of motivation, intelligence and ability, respectively, on leadership effectiveness, were tested by an analysis of variance. As mentioned earlier, each of the three variables had two levels, high and low. The three-way ANOVA enabled determination of the main and interaction effects of the three variables on group productivity. Level means also provided an indication of the differential effects of the two levels under each

variable. The moderating effects of these three variables were established by subjecting the LPC and group productivity scores to an analysis of covariance. The effects of the three variables as moderators were found by examining the analysis of covariance Table. A test of significance at the .10 level was used as a basis to reject the null hypothesis. Because of the small number of observations under each experimental condition, a lower level of confidence (such as .10) was accepted to test the hypothesis.

Group productivity was measured in two ways; the quality of solution, and the time needed for the decision. The scores derived under the two criteria could be combined into a composite score. But, this involved making arbitrary assumptions about the relationship between the two criteria, e.g., the time for decision and the quality of solution. It was decided therefore to perform separate analyses for each of the two criteria. One very important advantage of this separate analysis was that it enabled a study of the relationship between leadership, and group productivity using two very practical criteria applied by real life organizations to assess the productivity of their employees, namely, speed and quality of performance.

3.2 Leadership Style, Situational Favourability and Group Productivity

Experiment A was designed to test the validity of the Contingency Model in terms of definitions, methods and predictions of the model. Experiment A, leadership style was operationally defined in terms of the Least Preferred Co-worker Score (e.g.,

low LPC = Task Oriented; high LPC = People Oriented]. Leader Member Relations, Leader Position Power and Task Structure were considered as determining situational favourability. Group productivity was measured in terms of two criteria; speed and quality of group decision. In this Section of Chapter 3 evidence in support of Hypothesis I is examined.

Hypothesis I predicted that task oriented leaders (low LPC) will be effective in octants 1 and 8, while people oriented leaders (high LPC) will be successful in octant 4. The correlation between the LPC and group performance should be of the same magnitude and direction as predicted by the Contingency Model. As mentioned earlier, Hypothesis I was tested by computing the Spearman Rank Order Correlation between the LPC and group performance. The LPC scores and speed and quality scores were converted into ranks. A positive correlation indicated that high LPC scores were associated with high performance scores; conversely, a negative correlation signified that high LPC scores were associated with low performance scores. According to the Contingency Model, positive correlation indicated success of people oriented leaders while negative correlation would be associated with effectiveness of task oriented leaders.

Octants numbered 1, 4 and 8 were examined. The results found from Experiment A for the three octants with two criteria of group performance (e.g., speed and quality) are reported in Tables 10 and 11.

Results as described in Tables 10 and 11 gave moderate support to the predictions of the Contingency Model. The negative

correlation in octants 1 and 8 showed that task oriented leaders were more effective than people oriented leaders in the two octants. The positive correlation in octant 4 indicates that people oriented leaders were more successful than task oriented leaders. The comparison of r values between column 3 and column 4 of Tables 10 and 11 fairly attested to the validity of earlier predictions of the Contingency Model.

TABLE 10

Spearman Rank Order Correlation Between the LPC
Scores and Quality of Group Decision

Octant	N	r found in the present study	Predicted r in the Contingency Model
1	8	-.10	-.52
4	8	+.34	+.47
8	9	-.10	-.43

TABLE 11

Spearman Rank Order Correlation Between the LPC
Scores and Speed of Group Decision

Octant	N	r found in the present study	Earlier Predicted r in the Contingency Model
1	8	-.69*	-.52
4	8	+.48	+.47
8	8	-.51	-.43

* Significant at .05 level.

A few trends to be noticed in the results concern:

1) direction of the relationship; 2) magnitude of the relationship; and 3) statistical significance of the results.

As far as the direction of relationship was concerned, strong support was provided by the results described in Tables 10 and 11. All six r values found in the present study were in the same direction as was predicted by the Contingency Model. A part of Hypothesis I concerning the direction of relationship between the LPC and group performance scores was, therefore, considered as confirmed by the present findings.

Not so clear a picture emerged when one compares the results with reference to the magnitude of relationship. In case of quality of group decision (see Table 10), the degree of correlation was very small in octants numbered 1 and 8, while it was moderate in octant 4. On the other hand, in case of speed of group decision (see Table 11), all correlational values were very strong and of the same magnitude as was hypothesized.

When tested for statistical significance, all but one correlation value were found to be significant. Lack of statistical significance may cause concern in some quarters. But, it should not be surprising in the present case when one considers the small N values in column 2 of both Tables 10 and 11. Few of the earlier findings from the Contingency Model studies satisfied the canon of statistical significance. A large enough sample size may enable future investigators to overcome this problem.

In summary, the findings from the present investigation

were directionally significant; the magnitude of relationship was found to be satisfactory. If lack of statistical significance is not considered too formidable a shortcoming, it may be concluded that a further degree of support was provided by the present study to the Contingency Theory hypothesis (i.e., Hypothesis I of the present study).

3.3 Motivation, Intelligence and Ability as Moderators of Leadership Effectiveness.

Results reported in this section were derived from Experiment B as tests of Hypotheses II, III and IV. It may be recalled from Chapter I that Experiment B was designed to test whether three new variables, e.g., intelligence, ability and motivation should be considered in defining situational favourability for a leader. Hypotheses II, III and IV were proposed in this connection.

Hypothesis II predicted that leaders of motivated groups will achieve higher productivity (in terms of speed and quality of output) than leaders of non-motivated groups. Hypothesis III forecast that leaders of groups with high intelligence will turn out better and quicker group decisions than leaders of groups with low intelligence. Hypothesis IV predicted that a leader managing a group with higher ability will produce greater group output than a leader managing a group of low ability.

Hypotheses II, III and IV were tested by subjecting the data derived from Experiment B to two principal statistical analyses; a Three Way Analysis of Variance and an Analysis of Covariance.

The Three Way ANOVA assessed the main and interaction effects of motivation, intelligence and ability on the speed and quality of group output. This statistical analysis did not provide a direct test of the three hypotheses. It was carried out only to ascertain the effect of the three variables on group performance. Each of the three variables had two levels. The comparison of the level means provided information as to the differential effects of the levels under each variable. Tables 12 and 13 report the results found.

Tables 12 and 13 present the mean group performance scores and also the results of the Three Way Analysis of Variance. The group productivity scores indicate that there were differences in output between the two levels of the three variables under examination. For example, the average group productivity scores in Tables 12 (a) and 13 (a) indicate that groups with high intelligence, ability and motivation performed better than groups with low intelligence, ability and motivation. The degree of differential effect of two levels of the three variables varied between the two criteria of group performance, namely, speed and quality of group decisions. The differential effect of two levels of intelligence was stronger on the quality of decision than the speed of solution. On the other hand, motivation had a stronger effect on the speed of decision than on the quality of decision. The two levels of ability had a weak effect on both the speed and quality of decision.

Results from ANOVA as reported in Tables 12 (b) and 13 (b) supported what was shown in Tables 12 (a) and 13 (a). Intel-

Intelligence had a significant effect ($P \leq .02$ level) on groups'

TABLE 12

Effect of Motivation, Intelligence and Ability
on the Speed of Group Decision

a. Mean Group Performance Score

	LOW		HIGH	
Intelligence (A)	(n=12)	14.8	18.7	(n=12)
Ability (B)	(n=12)	16.3	17.1	(n=12)
Motivation (C)	(n=12)	12.8	20.6	(n=12)

b. Analysis of Variance

Source	Df	Mean Square	F	Significance
Intelligence (A)	1	9.2	1.49	N.S.
Self Esteem (B)	1	3.4	0.05	N.S.
Motivation (C)	1	3.6	5.85*	.02
A x B	1	3.7	0.01	N.S.
B x C	1	2.2	0.36	N.S.
A x C	1	7.1	0.11	N.S.
A x B x C	1	5.1	0.08	N.S.
Octant	2	7.8	1.26	N.S.
Error	14	6.2		

TABLE 13

Effect of Intelligence, Ability and Motivation
on the Quality of Group Decision

a. Mean Group Performance Scores

	LOW	HIGH
Intelligence (A)	9.8 (n=12)	12.3 (n=12)
Ability (B)	10.9 (n=12)	11.2 (n=12)
Motivation (C)	10.5 (n=12)	11.6 (n=12)

b. Analysis of Variance

Source	Df	Mean Square	F	Significance
Intelligence (A)	1	4.0	6.55*	0.02
Ability (B)	1	3.8	0.06	N.S.
Motivation (C)	1	7.1	1.15	N.S.
A x B	1	3.8	0.16	N.S.
B x C	1	1.1	0.17	N.S.
A x C	1	2.1	0.33	N.S.
A x B x C	1	3.4	0.55	N.S.
Octant	2	9.3	15.13	0.00
Error	14	6.1		

chance of achieving higher productivity in terms of higher quality but not in terms of higher speed. No significant differences were found in the effect of Ability on group productivity either in terms of quality or in speed of solution. Motivation affected the speed of group solution significantly ($p \leq .02$). Quality of solution was not affected by motivation.

The model of ANOVA used (as reported in Chapter 2) made possible the study of the first level (AB, BC, AC) as well as the second level of interaction (ABC) of the three variables. The small size of the F values for these interactions as reported in Table 12 (b) and 13 (b) indicate the insignificant nature of these interactions.

Octant effects reported in the two ANOVA Tables separated the effect of the original variables of the Contingency Model from the effects of the three additional variables introduced in this study. The scope of the present investigation included only a subset of the eight combinations of Fiedler variables of the Contingency Model. This limitation of the study precluded the possibility of identifying the effect of each of the Contingency Model variables separately. But, the octant effect in the ANOVA signified the combined effect of these variables; which was found to be significantly significant with respect to quality but not with respect to speed of group decision.

Data directly relevant to Hypotheses II, III and IV were analyzed by analysis of covariance. LPC was used as the covariate, speed and quality of group decision as the dependent variables, intelligence, ability and motivation as the moderating

variables. Tables 14 and 15 present the mean group performance scores and also the results from the analysis of covariance.

As found earlier in the ANOVA, the two levels of the three variables differentially affected the speed and quality of group decision. The magnitude of the differences was a little lower. (See Tables 14 (a) and 15 (a), as compared with Tables 12 (a) and 13 (a). This may be due to the fact that the group performance scores were adjusted by the differences in the LPC scores.

Moderate support was found for Hypothesis III, which stated that leaders of high intelligence groups will achieve higher productivity than leaders of low intelligence groups. Data reported in Tables 14 (b) and 15 (b) revealed that intelligence significantly affected the quality and speed of group decision after the latter were adjusted for the differences in the LPC scores. The results were tested for significance at .10 level.

No support was received for Hypothesis IV which stated that group productivity will significantly differ between groups of high ability as compared to groups of low ability. F values for the variable were very low under both the criteria of speed and quality of group solution.

Hypothesis II stated that higher productivity in terms of speed and quality will be associated with the state of motivation of the leader and his co-workers. Support for this hypothesis was partial. Table 14 (b) reports that speed of decision was significantly different ($p \leq .04$) between motivated and non-motivated groups. On the other hand, motivation did not make a significant difference in the quality of group decision (See

TABLE 14

Effect of Motivation, Intelligence and Ability
on the Relationship Between LPC and Speed
of Group Decision

a. Mean Group Performance Scores

	HIGH	LOW
Intelligence	18.7 (n=12)	13.3 (n=12)
Ability	16.3 (n=12)	15.6 (n=12)
Motivation	19.2 (n=12)	12.8 (n=12)

b. Analysis of Covariance

Source	Df	Mean Square	F	Significance
Intelligence	1	1.5	2.95	.10
Ability	1	2.5	0.05	N.S.
Motivation	1	2.4	4.74	.04
Octant	2	2.9	0.58	N.S.
Error	17	2.9		

TABLE 15

Effect of Intelligence, Ability and Motivation
on the Relationship Between LPC and Quality
of Group Decision

a. Mean Group Performance Scores

	HIGH	LOW
Intelligence	11.9 (n=12)	10.3 (n=12)
Ability	11.3 (n=12)	10.9 (n=12)
Motivation	11.5 (n=12)	10.7 (n=12)

b. Analysis of Covariance

Source	Df	Mean Square	F	Significance
Intelligence	1	1.16	2.99	.09
Ability	1	4.59	0.11	N.S.
Motivation	1	3.56	0.91	N.S.
Octant	2	8.06	20.68	0.00
Error	17	8.07		

Table 15 (b). Thus, it was found that leaders of motivated groups achieved higher productivity in terms of speed but failed to do so in terms of quality.

The effect of the Fiedler variables on the relationship between leadership style and group productivity remained the same as was found in the ANOVA reported earlier in this section. The octant effect (differences in task structure, position power and leader member relations) was statistically significant for the quality of group decision ($P \leq 05$) but not for the speed of group decision.

3.4 Summary of Findings

Results reported in the present chapter provided moderate support in terms of direction and magnitude of correlation for the Contingency Theory hypotheses. All but one result failed to satisfy the test of statistical significance.

In the extension part of the study the ability variable failed to demonstrate the effect hypothesized. The hypothesized effect of intelligence was supported. However, the evidence provided in favour of the hypothesized effect of motivation as a situational variable was only partial. Motivation significantly affected the speed of group decision, but failed to show any strong effect on the quality of group decision.

CHAPTER 4

DISCUSSION AND CONCLUSIONS

4.1. Findings Relevant to the Hypotheses

The findings from the present study provided moderate support for the Contingency Theory hypotheses. It was found that task oriented leaders were more effective in extremely favourable (Oct. 1) or extremely unfavourable (Oct. 8) situations, whereas people oriented leaders were successful in situations of intermediate favourableness (Oct. 4). This finding was, of course, subject to the specific definitions of 'situational favourability', 'leadership style' and 'leadership effectiveness' as specified in the Contingency Model of leadership effectiveness.

The results reported here also added to the mass of evidence that has been gathered over the past two decades on the contingency nature of leadership effectiveness. Results indicated that effectiveness of leader behaviour in achieving higher group productivity is dependent upon task structure, leader position power and leader member relations. Three characteristics of the results were noticed: 1) low correlation in two instances; 2) lack of statistical significance with the exception of one case; but 3) consistency in terms of direction of the present findings with those of earlier tests of the Contingency Model.

Some doubt has been cast on the plausibility of the

Contingency Theory hypotheses by several studies, notably those by Graen et al. (1970,1971). Because of the lack of what Graen et al. called 'evidential probability', lack of sensitivity of the model to "correctional influences", and also because of "experimenter bias effect", Graen and his associates observed:

... the Contingency Model of leadership effectiveness clearly has lost the capability of directing meaningful research. (p. 295).

It is interesting to note that Fiedler (1971a), after a careful review of the Contingency Model studies reported to date observed:

A series of studies, extending the theory was reviewed. Taken as a group, these studies provide strong evidence that the situational favourableness dimension does indeed moderate the relationship between leadership style and group performance and that it provides an important clue to our understanding of leadership phenomena. (p. 147.)

Confusing and contradictory as the above two opinions are, more puzzling are the data provided by both researchers in support of their contention. To put the issue into proper perspective, some findings from Fiedler (1971a) and Graen et al. (1970) are reproduced here in Tables 16 and 17 respectively.

TABLE 16⁺

Summary of Correlations Between LPC and Group Performance
Reported in Field and Laboratory Studies Testing
the Contingency Model

Study	Octants							
	I	II	III	IV	V	VI	VII	VIII
Field Studies								
Hunt (1967)	-.64 -.51		-.80 .60		.21		.30 -.30	
Hill (1969) a		-.10	-.29			-.24	.62	
Fiedler et al. (1969)		-.21		.00		.67*		-.51
O'Brien et al. (1969)		-.46		.47		-.45		.14
Laboratory Experiments								
Belgian Navy	-.72 -.77	.37 .50	-.16 -.54	.08 .13	.16 .03	.07 .14	.26 -.27	-.37 .60
Shima (1968) a		-.26		.71*				
Mitchell (1969)		.24 .17		.43 .38				
Fiedler exec. a		.34		.51				
Skrzpek	-.43	-.32	.10	.35	.28	.13	.08	-.33

TABLE 16 < continued;

	I	II	III	IV	V	VI	VII	VIII
Median:								
All studies	-.64	.17	-.22	.38	.22	.10	.26	-.35
Field studies	-.57	-.21	-.29	.23	.21	-.24	.30	-.33
Laboratory experiments	-.72	.24	-.16	.38	.16	.13	.08	-.33
Median correlations of Fiedler's original studies (1964)	-.52	-.58	.33	.47	.42		.05	-.44

NOTE: Number of correlations in the expected direction (exclusive of Octant VI, for which no prediction had been made) = 34; number of correlations opposite to expected direction = 11; p by binomial test = .01.

a Studies not conducted by the writer or his associates.

* $p \leq .05$.

+ Source: Fiedler (1971a, p. 140).

+
TABLE 17

Comparison of Antecedent and Evidential Correlations
Between LPC and Group Performance

Statistic	Octant							
	I	II	III	IV	V	VI	VII	VIII
Mean:								
Antecedent	-.54	-.60	-.17	.50	.41	-	.15	-.47
Evidential	-.16	.08	-.12	.04	.09	-.21	.15	.08
t means	1.83*	-2.44*	-.19	2.02*	2.56*	-	.00	-2.81**
Standard deviation:								
Antecedent	.25	.12	.56	.39	.15	-	.28	.35
Evidential	.62	.51	.52	.62	.29	.52	.38	.55
Number:								
Antecedent	8	3	12	10	6	0	12	12
Evidential	12	13	9	8	11	13	9	8

* $p \leq .05$.

** $p \leq .01$.

+ Source; Graen et al. (1970, p. 293).

Table 16 presents data that Fiedler has provided as a summary of all studies done on the Contingency Model with the exception of those by Graen et al. Data from the Graen Study were rejected by Fiedler on grounds of "flaws in the method of experimentation". On the basis of the results shown in the last four rows of Table 16, Fiedler concluded that the findings from Contingency Model studies reported after 1964 provided meaningful and consistent results except for octants 2 and 6, where some results were contrary to the Contingency Theory predictions.

Graen et al. (1970), on the other hand, reported their own findings which are reproduced in Table 17. These investigators computed a mean of correlations found from all the studies up to 1964 which they named as 'antecedent' correlation. They also computed a mean correlation of all studies reported after 1964 which they labelled 'evidential' correlation. The inconsistency between the 'antecedent' and 'evidential' correlations is obvious when one compares the first two rows of Table 4 of the Graen et al. (1970) study as reproduced here in Table 17. Since there was such a wide discrepancy between antecedent and evidential support in favour of the Contingency Model, Graen and his associated suggested that the model should be rejected.

It will be interesting to compare the findings from the present experiment with the findings of both researchers. Since the present study examined only 3 octants (octants 1, 4 and 8), data relevant only to these three octants will be considered. Tables 18 and 19 provide such a comparison.

TABLE 18

Comparison of Results Reported by Fiedler
(1971a, Table 6, p. 140) and the Present Study

Nature of Studies	Octant 1	Octant 4	Octant 8
All Studies	$r = -.64$	$r = .38$	$r = -.35$
Field Studies	$r = -.57$	$r = .23$	$r = -.33$
Laboratory Experiment	$r = -.72$	$r = .38$	$r = -.33$
Present Study: Quality & LPC	$r = -.10$	$r = .34$	$r = -.10$
Speed & LPC	$r = -.69^*$	$r = .48$	$r = -.51$
Median correlations of Fiedler's original studies (1964)	$r = -.52$	$r = .47$	$r = -.44$

TABLE 19

Comparison of Results Reported by Graen et al. (1970, Table 4, p. 293) and the Present Study			
Nature of Studies	Octant 1	Octant 4	Octant 8
Mean Antecedent	$r = -.54$	$r = .50$	$r = -.47$
Mean Evidential	$r = -.16$	$r = .04$	$r = .08$
Present Study Quality & LPC	$r = -.10$	$r = .34$	$r = -.10$
Present Study Speed & LPC	$r = -.69^*$	$r = .48$	$r = -.51$

Results reported in Table 18 indicate the consistency of findings from the present study with those reported by Fiedler (1971a) in his summary of studies based on the Contingency Model. Of the 6 correlations reported by the present study, 4 were of the same magnitude as found in both antecedent and evidential studies. All 6 correlations were in the same direction predicted by the model.

Results reported in Table 19, however, show a discrepancy between findings of the present study and those reported by Graen et al. (1970). While the correlations reported by the present study compare favourably with 'mean antecedent' correlations reported by Graen, they differ significantly in terms of both direction and magnitude from the 'mean evidential' correlations.

Comparative results as reported in Tables 18 and 19 tend to complement the cumulative findings reported by Fiedler and contradict those reported by Graen. This, however, should not be interpreted to mean that the evidence in favour of the Contingency Theory hypotheses are devoid of any bone of contention. Two factors which continue to cast doubt on the validity of Contingency Model predictions are: 1) the low magnitude of relationship found between LPC and group productivity; and 2) lack of statistical significance of the reported results. Five out of the six correlations reported may be criticized to have been obtained by chance.

The evidence that has been reported here on the question of leadership effectiveness may be criticised as not applicable to 'real world' leadership situations. The subjects in the present study were students. The leadership situations were artificially created. The external validity of most investigations of this nature is usually suspect (Weick, 1965). The results of the present investigation, however, complement what has been found in numerous field studies and field experiments. The present findings, therefore, may be accepted with a fair degree of confidence.

In the extension part of the study, it was established that intelligence of a leader and group members ought to be considered in defining situational favourability for a leader. Leaders of groups under the condition of high intelligence achieved significantly higher productivity than leaders of groups with low intelligence. This achievement of higher productivity

was noticed both in terms of quality and speed of the group decision making.

The results also indicated that ability of the leader and group members as operationally defined by self esteem did not affect the situation favourability for the leader. Groups under conditions of high and low ability achieved productivity with identical quality and speed. Because of this finding Hypothesis IV was rejected. It was speculated, however, that these results may have been obtained because of the way in which ability was operationally defined.

Some support was found in favour of the hypothesis that motivation of leaders and group members influences the effectiveness of a leader's role. Leaders of motivated groups solved the assigned problem within a significantly shorter time than did leaders of non-motivated groups. This relationship between motivation and group productivity, however, failed to affect the quality of group output. That is, no difference was found in the quality of group output between the motivated and non-motivated groups. Thus evidence reported here in favour of the hypothesized effect of motivation on leadership effectiveness can be considered as partial only.

It should be pointed out that the findings of the present study concerning the moderating effects of intelligence, ability and motivation on leadership effectiveness should be considered as tentative and exploratory. This study was the first investigation which tested these three variables in framework of the Contingency Theory of leadership. Further studies including

these variables are needed before appreciable confidence may be placed on the present findings.

One aspect of the findings in Experiment B concerned how the three variables would react on the eight original cells of the Contingency Model. It was not possible to answer the question here because of the limited number of cells that were studied. A more comprehensive study involving intelligence, ability and motivation as well as the three original contingency variables is needed to show how the variables interact on one another and also in combination.

It is believed however, that a reasonable amount of evidence was generated here to indicate that motivation, intelligence and ability should be considered as parameters of leadership favourability. The present study provided empirical support to the contentions of Fiedler (1967) and Hill (1969) that these variables do indeed moderate the relationship between leadership style and group productivity. Based on what has been learned from the present study, an extension of the model is recommended as shown in Figure I.

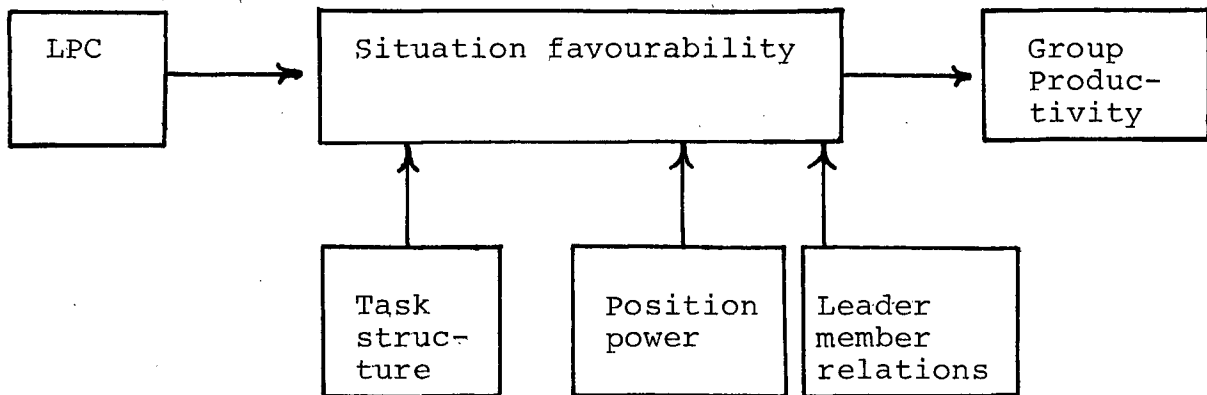
The present findings also added to the growing body of evidence regarding the interactive nature of the relationship between leadership style and situational favourability. The investigation was carried out in the context of the Contingency Theory. But the message was carried beyond this specific theory. The study may be considered as in union with other research that supports the contemporary viewpoint that leadership effectiveness is not just an outcome of style, but that it is a joint product of style, structure and situation.

FIGURE I

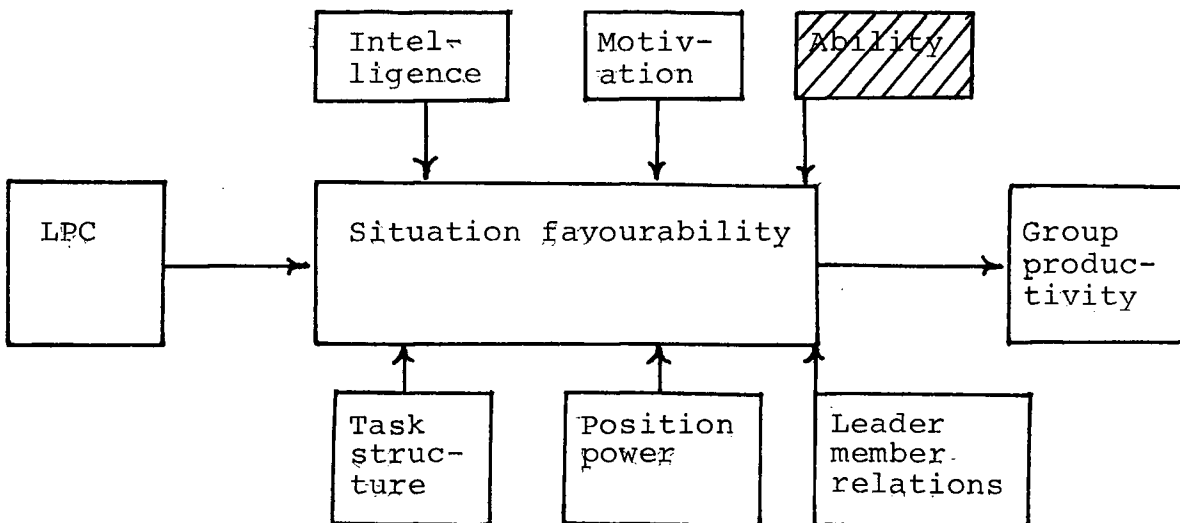
Situational Favourability, Leadership Style and Group Productivity


1 (a) The Contingency Model Variables:

Leadership style



1 (b) Extension:



 Indicates weak empirical support.

4.2 Relevance and Validity of the Measures:

It seems worthwhile to explore why Hypothesis IV regarding the postulated effect of ability on leadership effectiveness was not supported by the results. As already mentioned in Chapter 2, a satisfactory measure of task related ability for the kind of tasks used for the present study was very difficult to find. A measure of self esteem was accepted as an operational definition of ability. Self esteem indeed reflects an individual's permanent capacities which he has acquired over a long period of time. On a post hoc basis, it may be speculated that the kind of ability measure most appropriate for a thirty to forty-five minute experiment should be something more closely related to the task at hand. It may well be that the instrument used in the present study failed to tap the variable it purported to measure.

A measure which had a great deal of influence on the findings was the Least Preferred Co-worker measure. As explained earlier in Chapter 2, the controversy on the validity of the LPC measure has not been settled. An effort was made here to validate the measure by means of a panel rating of actual leader behaviour. Inter-rater reliability of the panel rating was found to be satisfactory but the validity was unknown of the questionnaire known as Leader Behaviour Rating that was used in panel rating. Consequently, it was difficult to explain the low correlation between LPC scores and panel ratings. The only conclusion that could be drawn was that leadership behaviour as measured by the LPC did not correlate with what a panel of

observers thought to be the demonstrated behaviour of the leaders. The true meaning of the LPC measure remains unknown.

Motivation as experimentally manipulated by cash rewards affected group productivity in terms of speed but not in terms of quality. This might be due to two reasons: 1) The subjects' understanding of what constituted quality of group decision was probably weaker than their appreciation of speed of decision. For example, in the unstructured task which required the groups to come up with a list of the five most important traits needed for success in a culture, it was difficult for the subjects to distinguish good quality from poor solutions. Speed of solution, on the other hand, was objectively recorded. The subjects knew that all they had to do to satisfy the criterion of quality was to minimize time to the best of their capacity.

2) Motivation was defined in terms of attraction toward some monetary incentive. Such a definition included only what Vroom (1964), Campbell et al. (1970) have called extrinsic motivation. No effort was made to differentiate and measure intrinsic motivation from extrinsic motivation. In completing the post experimental questionnaire on their level of motivation, some subjects rated themselves as 'motivated' when in fact they had been working under a 'non-motivated' experimental condition. When asked about the discrepancy, they admitted that they were motivated to do a good job simply for the enjoyment of doing a good job. They derived pleasure in performing as best they could. A more adequate manipulation and measurement of motivation was needed.

Task structure was manipulated in the experiment by means of task selection. According to Fiedler, a cutting score of five points distinguished structured from unstructured tasks. The two tasks selected for the experiment panel rating on structure were very close to the cutting point (e.g., 4.95 and 3.73). To strengthen the effect of task structure on leadership effectiveness, the difference score on rating of structure should be maximized. This was not possible because suitable tasks with larger difference scores were not available. Construction of suitable tasks to meet the specific demands of an experimental situation probably could alleviate this problem.

According to the Contingency Model, position power is defined in terms of two indices: 1) Capacity to reward, hire and fire; and 2) symbol of status. In an experimental situation, it is very difficult to provide a leader with such power. The leader in the present study had but little fate control over the group members who know the ad hoc nature of the leader's position power. In the strong position power condition, all the leader could offer to influence the members was a five dollar bill. Manipulation of this variable would in a real organization, be much more feasible.

The difficulties encountered in the manipulation of group atmosphere were identical with those faced in the attempted induction of position power. Because the subjects knew that they were in an experiment for only a short period of time, they tended not to express feelings of hostility to the leader and co-workers. Only in rare cases where a subject held a strong

opinion on an issue were these subject to censure by the group. Time tended to have some effect even on the care used in completing the Group Atmosphere questionnaire. Posthuma (1970) hypothesizes that because the subjects meet for a short period of time and may never meet again as a group, they tend to give a favourable rating to the group experience.

Interpersonal attraction was considered in the assignment of subjects to groups. It was thought that such interpersonal references would help to strengthen the quality of the group atmosphere and counter the effect of the artificiality of the experimental situation and short length of time period. Such experimental manipulation had some effect, but to a far less degree than was anticipated. Control of group atmosphere in an experimental study remains a difficult task to be accomplished.

The Contingency Model defines leadership effectiveness in terms of group productivity. Accordingly, significance of any finding from research on the model depends on the validity with which group productivity is measured. Two criteria of group productivity accepted for the study were speed and quality of group decision making. The measurement of speed was objective, since actual time taken by each of the groups was recorded. Thus the validity of the measurement of speed was beyond doubt.

Quality of group productivity on the other hand, was rated by a panel of judges in terms of four anchors (e.g., adequacy, issue involvement, exclusiveness, clarity of presentation) provided by the investigator. The choice of anchors was subject to the investigator's biases and accordingly result obtained

under the criterion 'quality' was subject to the particular definition of quality as adopted by the investigator.

4.3 Further Research Recommendations:

For the past few decades, more questions have been raised in research on leadership than it has been possible to answer. What attributes made leadership possible, was probably the first question to start a series of research undertakings. Hundreds of physical and mental qualities were correlated with leadership positions. In the process, the need for considering the situation became apparent. Before the situational approach could divert research attention to the extreme, the 'Personality x Situation' movement emerged. The present research focus on leadership is concerned with specifying clearly what personality or style will marry with what situational variables.

As mentioned earlier, there has been no little debate whether the research program on the Contingency Model should be continued (Graen et al., 1970, Fiedler, 1971). The study reported here was carried on in the belief that more research was required before final judgment could be reached on the validity of the model. Further efforts were needed to specify carefully the relevant factors to be considered in defining situation favourability. The results reported here lend some support to the Contingency Model hypotheses. Three new variables, intelligence, ability and motivation were examined as attributes of the parameter called situation favourability. The effort to examine the effect of these variables met with various degrees of success.

More and better controlled studies, however, are necessary before we can place confidence in the findings of the present investigation.

It was speculated that measurement of the variable 'ability' was not satisfactory. Future research should examine this variable as a contingency for leadership effectiveness in a more task related sense (technical qualification rather than self esteem). Further, the variable 'motivation' should be manipulated more adequately in both the 'intrinsic' and 'extrinsic' sense of the term. The influence of the individual's state of motivation as a moderator of leadership effectiveness was established here. Future studies may be able to establish even stronger effects for this variable if it is measured more adequately.

Because of sampling and design limitations, it was not possible to examine the effect of the three added variables on the original variables of the Contingency Model. A study using all combinations of the six variables should be designed and conducted. Appropriate measurement of the main and interaction effects of the six variables on leadership and group performance will indicate the nature of the relationship that may exist among the six situational parameters.

It was observed earlier that experimental manipulations with regard to group atmosphere and leader position were not strong because of the brevity of the experimental time period. It would also be worth exploring whether time as an independent

variable has any effect on the relationship between LPC score and group productivity. A longitudinal study would answer the question as to whether situational favourability of a leader changes over time. A longitudinal study involving a long period of time, of course, cannot be conducted in the context of a laboratory experiment. A field experiment or a field study will be needed to study the effects of time on leadership effectiveness.

One concern universally voiced by critics of findings from studies on the Contingency Model regards the statistical reliability of the findings. Studies thus far have not produced statistically significant results. Statistical significance, however, is a function of large sample size. Unfortunately, it has not been feasible for most investigators to obtain a large size sample for studies of the Contingency Model with its eight cells and requirement for one group to provide a single observation. In the present study, correlations as high as $r = .52$ were not statistically significant since the results were obtained with sample size of eight observations. Studies with larger sample sizes seem needed if statistical significance is to be achieved.

The present investigator concurs with the opinion of Graen et al. (1970) that an inductively derived theory such as the Contingency Model, should be sensitive to "correctional influences" in terms of new findings. The theorist should be prepared to accept modifications that may be proposed from time to time on the basis of ongoing research experience. The study reported

here established that at least three additional variables may be needed to define situational favourability. Future studies may reveal still further leadership contingencies than were hypothesized here.

4.4 Conclusion

Based on data provided in Chapter 3 and discussion in Chapter 4, the following conclusions may be drawn from the present study:

1. The study provided additional evidence on the validity of the Contingency Model of leadership effectiveness. Results reported in Tables 10 and 11 provided moderate support for the predictions of the model. From a comparison of findings of the present study with those of Fiedler (1971a) and Graen et al. (1970), it may be concluded that the present study tended to complement the earlier findings reported by Fiedler and contradict Graen et al.'s observations on the validity of the model.
2. In the extension part of the study, it was found:
 - a) that motivation significantly affected the speed of group decision and contributed to the leader's effectiveness;
 - b) that intelligence of the leaders and group members significantly affected both the quality and speed of group decision;
 - c) that ability as operationally defined by a self esteem measure did not affect either the

speed or the quality of group decision;

d) that motivation did not influence the quality of group output.

On the basis of findings 2 (a), 2 (b), 2 (c), 2 (d), it may be concluded that intelligence, motivation and perhaps ability should be incorporated in future studies of the Contingency Model as parameters of situation favourability.

3. The study also added indirectly to our knowledge of leadership behaviour by showing that leadership effectiveness is a joint product of style, structure and situation.

The study has tested the effect of three leadership contingencies and has also added to the plausibility of one of the advanced theories of leadership (i.e., the Contingency Model). It is expected that future studies will continue exploring the relationships that may exist between leadership style, group productivity and situation favourability.

APPENDIX I

BERGER'S ACCEPTANCE OF SELF SCALE

Following are questions of some of your attitudes. Of course there is no right answer for any statement. The best answer is that you feel is true of yourself.

You are to respond to each question by circling a number preceding each question according to the following scheme:

1	2	3	4	5
Not at all true of myself	Slightly true of myself	About half- way true of myself	Mostly true of myself	True of myself

Remember, the best answer is the one which applies to you.

- 1 2 3 4 5 (1) I'd like it if I could find someone who would tell me how to solve my personal problems.
- 1 2 3 4 5 (2) I don't question my worth as a person, even if I think others do.
- 1 2 3 4 5 (3) When people say nice things about me, I find it difficult to believe they really mean it. I think maybe they're kidding me or just aren't being sincere.
- 1 2 3 4 5 (4) If there is any criticism or anyone says anything about me, I just can't take it.
- 1 2 3 4 5 (5) I don't say much at social affairs because I'm afraid that people will criticize me or laugh if I say the wrong thing.
- 1 2 3 4 5 (6) I realize that I'm not living very effectively but I just don't believe I've got it in me to use my energies in better ways.
- 1 2 3 4 5 (7) I look on most of the feelings and impulses I have toward people as being quite natural and acceptable.
- 1 2 3 4 5 (8) Something inside me just won't let me be satisfied with any job I've done -- if it turns out well, I get a very smug feeling that this is beneath me, I should not be satisfied with this; this isn't a fair test.
- 1 2 3 4 5 (9) I feel different from other people. I'd like to have the feeling of security that comes from knowing I'm not too different from others.

- 1 2 3 4 5 (10) I'm afraid for people that I like to find out what I'm really like, for fear they'd be disappointed in me.
- 1 2 3 4 5 (11) I am frequently bothered by feelings of inferiority.
- 1 2 3 4 5 (12) Because of other people, I haven't been able to achieve as much as I should have.
- 1 2 3 4 5 (13) I am quite shy and self-conscious in social situations.
- 1 2 3 4 5 (14) In order to get along and be liked, I tend to be what people expect me to be rather than anything else.
- 1 2 3 4 5 (15) I seem to have a real inner strength in handling things. I'm on pretty solid foundation and it makes me pretty sure of myself.
- 1 2 3 4 5 (16) I feel self-conscious when I'm with people who have a superior position to mine in business or at school.
- 1 2 3 4 5 (17) I think I'm neurotic or something .
- 1 2 3 4 5 (18) Very often I don't try to be friendly with people because I think they don't like me.
- 1 2 3 4 5 (19) I feel that I'm a person of worth, on an equal plane with others.
- 1 2 3 4 5 (20) I can't avoid feeling guilty about the way I feel toward certain people in my life.
- 1 2 3 4 5 (21) I'm not afraid of meeting new people. I feel that I'm a worthwhile person and there's no reason why they should dislike me.
- 1 2 3 4 5 (22) I sort of only half-believe in myself.
- 1 2 3 4 5 (23) I'm very sensitive. People say things and I have a tendency to think they're criticizing me or insulting me in some way and later when I think of it, they may not have meant anything like that at all.
- 1 2 3 4 5 (24) I think I have certain abilities and other people say so too, but I wonder if I'm not giving them an importance way beyond what they deserve.

- 1 2 3 4 5 (25) I feel confident that I can do something about problems that may arise in the future.
- 1 2 3 4 5 (26) I guess I put on a show to impress people. I know I'm not the person I pretend to be.
- 1 2 3 4 5 (27) I do not worry or condemn myself if other people pass judgment against me.
- 1 2 3 4 5 (28) I don't feel very normal, but I want to feel normal.
- 1 2 3 4 5 (29) When I'm in a group I usually don't say much for fear of saying the wrong thing.
- 1 2 3 4 5 (30) I have a tendency to sidestep my problems.
- 1 2 3 4 5 (31) Even when people do think well of me, I feel sort of guilty because I know I must be fooling them -- that if I were really to be myself, they wouldn't think well of me.
- 1 2 3 4 5 (32) I feel that I'm on the same level as other people and that helps to establish good relations with them.
- 1 2 3 4 5 (33) I feel that people are apt to react differently to me than they would normally react to other people.
- 1 2 3 4 5 (34) I live too much by other people's standards.
- 1 2 3 4 5 (35) When I have to address a group, I get self-conscious and have difficulty saying things well.
- 1 2 3 4 5 (36) If I didn't always have such hard luck, I'd accomplish much more than I have.

APPENDIX II

SOCIOMETRIC PREFERENCE RATING

SOCIOMETRIC PREFERENCE RATING

NAME: _____

Suppose you are given a group assignment. Name, in order of preference, five students from Com. 221 you would enjoy working with. (YOUR OPINIONS WILL BE KEPT STRICTLY CONFIDENTIAL).

1. _____
2. _____
3. _____
4. _____
5. _____

APPENDIX III

THE LEAST PREFERRED COWORKER SCALE

People differ in the ways they think about those with whom they work. This may be important in working with others. Please give your immediate, first reaction to the items on the following page.

On the following sheet are pairs of words which are opposite in meaning, such as Very Neat and Not Neat. You are asked to describe someone with whom you have worked by placing an "X" in one of the eight spaces on the line between the two words.

Each space represents how well the adjective fits the person you are describing, as if it were written:

Very	:	:	:	:	:	:	:	:	:	Not
Neat:	:	:	:	:	:	:	:	:	:	:Neat
8	7	6	5	4	3	2	1			
Very	Quite	Some-	Slightly	Slightly	Some-	Quite	Very			
Neat	Neat	what	Neat	Untidy	what	Untidy	Untidy			
		Neat			Untidy					

FOR EXAMPLE: If you were to describe the person with whom you are able to work least well, and you ordinarily think of him as being quite neat, you would put an "X" in the second space from the words Very Neat, like this:

Very	:	:	:	:	:	:	:	:	:	Not
Neat:	:	X	:	:	:	:	:	:	:	:Neat
8	7	6	5	4	3	2	1			
Very	Quite	Some-	Slightly	Slightly	Some-	Quite	Very			
Neat	Neat	what	Neat	Untidy	what	Untidy	Untidy			
		Neat			Untidy					

If you ordinarily think of the person with whom you can work least well as being only slightly neat, you would put your "X" as follows:

Very	:	:	:	:	:	:	:	:	:	Not
Neat:	:	:	:	X	:	:	:	:	:	:Neat
8	7	6	5	4	3	2	1			
Very	Quite	Some-	Slightly	Slightly	Some-	Quite	Very			
Neat	Neat	what	Neat	Untidy	what	Untidy	Untidy			
		Neat			Untidy					

If you would think of him as being very untidy, you would use the space nearest the words Not Neat.

Very	:	:	:	:	:	:	:	:	:	Not
Neat:	:	:	:	:	:	:	:	:	X	:Neat
8	7	6	5	4	3	2	1			
Very	Quite	Some-	Slightly	Slightly	Some-	Quite	Very			
Neat	Neat	what	Neat	Untidy	what	Untidy	Untidy			
		Neat			Untidy					

Look at the words at both ends of the line before you put in your "X". Please remember that there are no right or wrong answers. Work rapidly; your first answer is likely to be the best. Please do not omit any items, and mark each item only once.

LPC

Think of the person with whom you can work least well. He may be someone you work with now, or he may be someone you knew in the past.

He does not have to be the person you like least well, but should be the person with whom you had the most difficulty in getting a job done. Describe this person as he appears to you.

Pleasant:	:	:	:	:	:	:	:	:	:	Unpleasant
	8	7	6	5	4	3	2	1		
Friendly:	:	:	:	:	:	:	:	:	:	Unfriendly
	8	7	6	5	4	3	2	1		
Rejecting:	:	:	:	:	:	:	:	:	:	Accepting
	8	7	6	5	4	3	2	1		
Helpful:	:	:	:	:	:	:	:	:	:	Frustrating
	8	7	6	5	4	3	2	1		
Unenthusiastic:	:	:	:	:	:	:	:	:	:	Enthusiastic
	8	7	6	5	4	3	2	1		
Tense:	:	:	:	:	:	:	:	:	:	Relaxed
	8	7	6	5	4	3	2	1		
Distant:	:	:	:	:	:	:	:	:	:	Close
	8	7	6	5	4	3	2	1		
Cold:	:	:	:	:	:	:	:	:	:	Warm
	8	7	6	5	4	3	2	1		
Cooperative:	:	:	:	:	:	:	:	:	:	Uncooperative
	8	7	6	5	4	3	2	1		
Supportive:	:	:	:	:	:	:	:	:	:	Hostile
	8	7	6	5	4	3	2	1		
Boring:	:	:	:	:	:	:	:	:	:	Interesting
	8	7	6	5	4	3	2	1		
Quarrelsome:	:	:	:	:	:	:	:	:	:	Harmonious
	8	7	6	5	4	3	2	1		
Self-assured:	:	:	:	:	:	:	:	:	:	Hesitant
	8	7	6	5	4	3	2	1		
Efficient:	:	:	:	:	:	:	:	:	:	Inefficient
	8	7	6	5	4	3	2	1		
Gloomy:	:	:	:	:	:	:	:	:	:	Cheerful
	8	7	6	5	4	3	2	1		
Open:	:	:	:	:	:	:	:	:	:	Guarded
	8	7	6	5	4	3	2	1		

APPENDIX IV

TASK 23

from

M.E. Shaw's Taxonomy of Experimental Tasks, 1963

PROBLEM: "What makes for success in our culture?"

INSTRUCTIONS: Your task is to discuss the question you have been given and decide among yourselves the five most important traits a person needs for success in our culture. When you have arrived at a decision, write the list of traits on a sheet of paper and hand it to me.

GOOD LUCK

APPENDIX V

TASK 59

from

M.E. Shaw's Taxonomy of Experimental Tasks, (1963)

TASK AND INSTRUCTIONS;

Suppose you are a five man team whose job is to manufacture a product, the completion of which requires the operation of five machines. In the past you have rotated positions to avoid boredom, but each man has spent most of the time operating the machine that he prefers. John prefers machine 3, Steve machine 2, Walt machine 4, Robert machine 1, and Denis machine 5.

The Methods man has been around checking the time each man requires to complete the operation on one product when he is operating each of the five machines. He has come up with the following results:

	Machines				
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
John	3 min.	3 min.	4 min.	3 1/2 min.	4 1/2 min.
Steve	2 min.	2 min.	5 min.	2 1/2 min.	3 1/2 min.
Walt	1 min.	2 min.	5 min.	2 min.	1 1/2 min.
Robert	4 min.	1 min.	3 min.	3 1/2 min.	3 min.
Denis	5 min.	3 min.	2 min.	5 min.	3 min.

Your foreman noticed that when each man runs the machine he most prefers, the total time spent on each product is 16 minutes. It seems to him that a different method of operation would result in substantial savings. He believes in letting his workers make their own decision, in so far as possible, and has asked that you consider the problem and try to come up with a plan that will be more efficient than the present mode of

operation.

Your task is now to examine the data provided by the methods man and decide which person should operate which machine. When you have reached a decision, please write your plan out in detail on the paper provided.

APPENDIX VI

Rating of Position Power & Motivation

For Leaders Only

Please respond to the following two questions by circling a number according to the following scheme:

- | | |
|---|---------------------------------|
| 5 | A great deal |
| 4 | Somewhat less than a great deal |
| 3 | More than a little |
| 2 | Just a little |
| 1 | None at all |

- 1) How much position power (e.g., symbol of your Status, capacity to reward) did you have in carrying out the group assignment?

A great deal: 5 4 3 2 1 :None at all

- 2) How motivated did you feel to do well in the group assignment?

5 4 3 2 1

APPENDIX VII

Rating of

Leader Behaviour, Position Power & Motivation

For Co-workers Only

LEADER BEHAVIOUR RATING

Please describe the behaviour of the leader of the present group by checking the following items:

- | | | |
|-------------------|-------------------------------|----------------------|
| 1. Permissive: | 8 : 7 : 6 : 5 : 4 : 3 : 2 : 1 | :Strict |
| 2. Requesting: | 8 : 7 : 6 : 5 : 4 : 3 : 2 : 1 | :Ordering |
| 3. Considerate: | 8 : 7 : 6 : 5 : 4 : 3 : 2 : 1 | :Rude |
| 4. Participating: | 8 : 7 : 6 : 5 : 4 : 3 : 2 : 1 | :Managing |
| 5. Passive: | 8 : 7 : 6 : 5 : 4 : 3 : 2 : 1 | :Active |
| 6. Task Sharing: | 8 : 7 : 6 : 5 : 4 : 3 : 2 : 1 | :Task
Controlling |

Following are questions about your group. Please respond to each question by circling a number according to the following scheme:

- | | |
|---|---------------------------------|
| 5 | A great deal |
| 4 | Somewhat less than a great deal |
| 3 | More than a little |
| 2 | Just a little |
| 1 | None at all |

- 1) How much position power (e.g., symbol of status, capacity to reward, etc.) the leader of your group had in carrying out the group assignment?

A great deal: 5 4 3 2 1 :None at all

- 2) How motivated did you feel to do well in the group assignment?

5 4 3 2 1

APPENDIX VIII

The Group Atmosphere Scale

GROUP ATMOSPHERE SCALE

Describe the atmosphere of your group by checking the following items:

1. Pleasant:	:	:	:	:	:	:	:	:	:	:Unpleasant
	8	7	6	5	4	3	2	1		
					:					
2. Friendly:	:	:	:	:	:	:	:	:	:	:Unfriendly
	8	7	6	5	4	3	2	1		
					:					
3. Bad:	:	:	:	:	:	:	:	:	:	:Good
	8	7	6	5	4	3	2	1		
					:					
4. Worthless:	:	:	:	:	:	:	:	:	:	:Valuable
	8	7	6	5	4	3	2	1		
					:					
5. Distant:	:	:	:	:	:	:	:	:	:	:Close
	8	7	6	5	4	3	2	1		
					:					
6. Cold:	:	:	:	:	:	:	:	:	:	:Warm
	8	7	6	5	4	3	2	1		
					:					
7. Quarrelsome:	:	:	:	:	:	:	:	:	:	:Harmonious
	8	7	6	5	4	3	2	1		
					:					
8. Self-assured:	:	:	:	:	:	:	:	:	:	:Hesitant
	8	7	6	5	4	3	2	1		
					:					
9. Efficient:	:	:	:	:	:	:	:	:	:	:Inefficient
	8	7	6	5	4	3	2	1		
					:					
10. Gloomy:	:	:	:	:	:	:	:	:	:	:Cheerful
	8	7	6	5	4	3	2	1		

APPENDIX IX

Rating Quality of Group Solution

QUALITY OF SOLUTION: This particular criterion for group output may be conceived as consisting of the following:

1. Adequacy: for example, how adequate the five traits mentioned are for attaining success.
2. Issue involvement: how relevant the solution is to the problem. For example, are the five traits mentioned related to the attainment of success.
3. Exclusiveness: are the traits mentioned mutually exclusive, that is, independent. A high quality solution should have mutually exclusive traits.
4. Clarity of presentation: did the group present their ideas clearly? Are the ideas well-expressed?

The following classification scheme is applicable for the evaluation job to be done by the judges:

- 5 very much
- 4 less than very much
- 3 somewhat
- 2 just a little
- 1 none

Please evaluate the present group's solution on adequacy:

A. very much: 5 4 3 2 1 :none

B. Please evaluate the present group's solution on issue involvement:

very much: 5 4 3 2 1 :none

C. Please evaluate the present group's solution on exclusiveness:

very much: 5 4 3 2 1 :none

D. Please evaluate the present group's solution on clarity of presentation:

very much: 5 4 3 2 1 :none

APPENDIX X

Leader Behaviour Rating

Observers Only

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