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THE EFFECT OF CULTURAL HETEROGENEITY, LEADER POWER, AND LEADER ATTITUDES ON GROUP PERFORMANCE: A TEST OF THE CONTINGENCY MODEL

FRED E. FIEDLER
UNIVERSITY OF ILLINOIS
TECHNICAL REPORT NO. 25
AUGUST, 1965

A Joint Report of the Project
Group and Organizational Factors Influencing Creativity
Contract NR 177-472, Nonr-1834(36) with the Advanced Research
Projects Agency and the Office of Naval Research

FRED E. FIEDLER, LAWRENCE M. STOLUROV,
and HARRY C. TRIANDIS
Principal Investigators
and of the
Center for Social Studies
Ministry of National Defense, Brussels, Belgium
U. BOUVIER, Director

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and Leader Attitudes on Group Performance:

A Test of the Contingency Model

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writer for the year 1963-1964.

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A B S T R A C T

The Effect of Cultural Heterogeneity, Leader Power, and

Leader Attitudes on Group Performance:

A Test of the Contingency Model

Fred E. Fiedler

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An experiment was conducted (a) to compare the performance of 96 culturally and linguistically homogeneous and heterogeneous three-man teams under powerful and weak leadership positions and on three types of tasks varying in structure and requirements for verbal interaction, and (b) to test a previously described Contingency Model of Leadership Effectiveness.

The experiment, conducted in collaboration with the Belgian Naval Forces, utilized 280 petty officers and men from a naval training center, who were assigned to 96 groups in a 16-cell design.

Homocultural and heterocultural groups differed in performance only on the highly verbal task. Heterogeneous groups, despite obvious communication difficulties and culturally divergent background, performed about as well on the structured and non-verbal tasks as did homogeneous groups. Groups led by recruit leaders performed as well as groups directed by petty officers. Thus, neither the military leadership training and experience nor the position power of petty officers contributed to the effectiveness of these groups. These findings have considerable potential implications for leadership training programs and an evaluation of the communication variable in affecting group productivity.

The experiment clearly supported the hypothesis derived from the Contingency Model that the specific leadership style required for effective group performance is contingent upon the favorableness of the group-task situation. As in previous research, groups under managing, task-controlling (low LPC) leaders performed best in very favorable group-task situations as well as in group-task situations which were relatively unfavorable or very unfavorable. Permissive, considerate, group-oriented leaders performed best in situations intermediate in favorableness.

The Effect of Cultural Heterogeneity and Leader Power on Group Performance

This experiment, conducted in cooperation with the Belgian Navy, investigated the effects of linguistic and cultural heterogeneity and the leader's position power on team performance under different group-task conditions.

The performance of heterocultural groups is today of considerable importance. It is especially critical in the large number of countries which have culturally and linguistically diverse populations. These, to mention but a few, include Belgium, Canada, Finland, Israel, Italy, Mexico, Spain, Switzerland, Yugoslavia and the United States, as well as practically all underdeveloped countries in the African and Asian continents. The problem of cultural heterogeneity is likewise a focal concern in international business and governmental organization, and in the increasing number of multilateral military operations which use personnel from different countries in closely cooperating or integrated units. Finally, it has implications for the management of interdisciplinary research and development teams where heterogeneity is due to technical background and training, or to groups where the diversity is due to large differences in socio-economic status among members.

This study had two major purposes. First, it tested whether the culturally homogeneous task groups perform significantly better than heterogeneous task groups on three types of tasks, and whether such teams will perform better under trained and powerful leadership than under inexperienced and weak leadership.

Second, the study attempted a validation and extension of the recently proposed Contingency Model of leadership effectiveness (Fiedler, 1964).

Design and Method

Subjects

The experiment was conducted at the Belgian Naval Training Center in Ste. Croix-Bruges, using 240 recruits and 40 petty officers. Half of these petty officers and recruits were from French-speaking homes, the other half from Dutch-speaking homes. The recruits, ranging in age from seventeen to twenty-four (mean age of 20.17), serve in the Belgian Navy for a term of 12 (now 15) months after which most of them return to civilian life. Petty officers are career men who expect to remain in service for twenty years or more. They typically complete two years of petty officer candidate school which provides leadership and technical instruction. Petty officer candidates enter this school directly after high school or the equivalent technical high school, and they are required to pay a nominal charge for their room and board while attending school. Promotion from the ranks is possible, but unusual. As a result, the Belgian Navy petty officer is highly committed to his career, and enjoys considerable prestige and power; his status is roughly comparable to that of the U.S. Navy's chief petty officer or warrant officer. The 40 petty officers in our sample ranged in age from 19 to 45 years, with a mean of 29.48, and they had, on the average, about ten years of leadership experience as petty officers in the Navy.

Belgium is sharply divided into two population and geographical sectors. Roughly 55 percent of the population is Flemish and lives in the northern half of Belgium, with Dutch as the official language. The remaining 45 percent of the population is French-speaking. It consists of Walloons who live in the southern part of the country and of the majority of the inhabitants of Brussels, which is primarily French-speaking although officially bilingual. Only the minority of Belgians is fluently bilingual, and relatively few French-speaking Belgians are able to speak Dutch.

Since its independence in 1830, the country has been enmeshed in the so-called "linguistic conflict" which has had far-reaching repercussions on its economic, social, and political life. There are considerable cultural and linguistic differences between the Flemish and French-speaking populations (although to a lesser degree than between the populations of Holland and France). The armed services, therefore, have established separate Dutch- and French-speaking units, and officers and petty officers are expected to give orders, training and instructions in the men's mother tongue. Bilingual units are avoided wherever possible.

Pre-Tests

All available petty officers and men (N = 546) at the Naval Training Center were given a series of pre-tests and questionnaires which served as the basis for the assembly of teams in the main study. All questionnaires were presented in the subject's mother tongue. Those most relevant to the present discussion were:

(a) Descriptions of least preferred coworkers (LPC). These constituted the major predictors of this study and have been extensively described in other papers (Fiedler, 1962; Bass and Fiedler, 1962). Previous studies have shown that these measures of leadership style play an important role in determining the success of team performance, and that different leadership styles may be required in different situations (Fiedler, 1964, 1965). LPC scores were obtained by asking the men to think of all the coworkers they had ever had and to describe the one individual with whom they could work least well. Thus, the least preferred coworker would not need to be someone with whom the rater worked at the time of being tested. In fact, these scales were here administered before the teams were formed. The LPC scale consisted of eight-point graphic scale items modeled after the Semantic

Differential (Osgood, 1957), and contained 20 items (in Dutch or French) such as the following:

Pleasant : 0 : 7 : 6 : 5 : 4 : 3 : 2 : 1 : Unpleasant
Friendly : 0 : 7 : 6 : 5 : 4 : 3 : 2 : 1 : Unfriendly¹

The LPC score is the sum of the twenty-item scores, with the most favorable scale position counted 8 and the least favorable scale position counted 1. A person who describes even his least preferred coworker in a relatively favorable manner (high LPC) tends to be passive, permissive, non-directive, and "considerate" in Hemphill's terms (Stogdill and Coons, 1957). A low LPC person, who sees his least preferred coworker in a very unfavorable, rejecting manner, normally tends to be active, directive, task controlling, punitive and structuring in his leader behavior, and tends to have a low score on the Consideration scale (see Morris and Fiedler, 1964; Bass, Fiedler, and Krueger, 1964; Hawkins, 1962).

(b) Verbal intelligence. A short verbal intelligence scale, standardized for Belgium in Dutch and French was administered to assess the level of intellectual functioning.

(c) Attitude scale. A measure of attitude toward Flemish or French-speaking Belgians (Nuttin, J., 1960), was administered to determine the mer.'s attitudes toward members of the other population group. The major

¹Other items on this scale were: pleasant-unpleasant; friendly-unfriendly; accepting-rejecting; helpful-frustrating; enthusiastic-unenthusiastic; lots of fun-serious; relaxed-tense; close-distant; warm-cold; cooperative-uncooperative; supportive-hostile; interesting-boring; harmonious-quarrelsome; self-assured-hesitant; efficient-inefficient; cheerful-gloomy; open-guarded.

purpose of this scale was to assure that the bilingual men who served as subjects would not be systematically more favorable or unfavorable to the other language group than monolingual men.

(d) Language comprehension. A short language comprehension scale was developed to assess the ability of the men to understand and communicate in the second language of their country. This scale involved reading to French-speaking subjects a set of simple instructions in Dutch, and vice versa. To be assigned to heterogeneous groups, a man had to be able to follow the instructions on at least four of the six items. The men who passed this test were at least marginally able to communicate in the other national language. Relatively few men were fluently bilingual.

Group Dimensions

Position power. In 48 of the 96 groups, the leaders were petty officers who, as already mentioned, enjoy considerable prestige in the Belgian Navy. The position power of petty officers was further increased (a) by giving the written task instructions in the leader's language, and (b) by telling the groups that the leader's decision was to be final in all controversial matters.

The 48 groups with low position power had recruits as leaders. Task instructions were given in the language of the group members rather than that of the leader (this, of course, was important only in the case of heterogeneous groups). These groups were instructed that all decisions would have to be unanimous; all response sheets containing the group solutions had to be signed by all three group members.

Heterogeneity. One of the major aims of this study was the comparison of culturally homogeneous and heterogeneous groups. The 48 homogeneous groups consisted of three French-speaking men or three Dutch-speaking men. The 48

heterogeneous groups consisted either of a French-speaking leader and two Dutch-speaking members, or a Dutch-speaking leader and two French-speaking members.

Construction of groups. To recapitulate, 120 French- and 120 Dutch-speaking men, as well as 24 petty officers from each language group participated. Intelligence, LPC, and attitude scores were used in matching, so that the groups were quite similar, man for man, on all control variables.

The men were assigned to 96 three-man teams. The design of the study involved sixteen cells with six groups per cell. Eight cells contained the 48 homogeneous and eight the 48 heterogeneous groups, eight had Flemish and eight Francophone leaders, eight contained groups with high position power and eight with low position power. We utilized three types of tasks, which will be described below. These varied in task structure and in the degree to which they demanded verbal interaction among the men. The presentation of the tasks was counterbalanced so that groups in eight cells started to work with a structured task while the groups in the other eight began with the unstructured task (a non-verbal, copying task was given last).

(See Table 1.) All 96 groups were run on the same day to prevent communication among the men about tasks or procedures.

The six groups within each cell were further subdivided so that three groups were in the upper half and three in the lower half of the intelligence score distribution of our subjects; two groups were high, two medium, and two low in LPC scores. It should be noted that this procedure resulted in groups which were quite homogeneous with respect to intelligence level and LPC scores (See Table 2). The cell means on intelligence, LPC, and attitude scores were nearly equal. The men in the heterogeneous groups necessarily had higher language comprehension scores.

Table 1

Design of the Experiment^a

| Leader's Language | High Position Power | | Low Position Power | |
|----------------------|---------------------|------------------|--------------------|------------------|
| | Task Sequence | | Task Sequence | |
| | <u>UT-ST-NVT</u> | <u>ST-UT-NVT</u> | <u>UT-ST-NVT</u> | <u>ST-UT-NVT</u> |
| Homogeneous | | | | |
| Dutch | D ^b | H | N | R |
| French | E | K | O | S |
| Heterogeneous | | | | |
| Dutch | F | L | P | T |
| French | G | M | Q | U |

^aUT = Unstructured Task; ST = Structured Task; NVT = Non-verbal Task.

^bLetters D through U identify cells in this study.

Table 2

LPC and Intelligence Distribution
of Groups Within Each Cell

| Intelligence of Group | <u>LPC of Leader and Group Members</u> | | |
|--------------------------|--|---------------|--------------|
| | <u>High</u> | <u>Medium</u> | <u>Low</u> |
| High | One Group | One Group | One Group |
| Low | One Group | One Group | One Group |

Group Tasks

Three types of group tasks were used. These tasks varied in task structure and in verbal interaction requirements. The task goal and the procedure in the structured tasks were clearly apparent to the subjects and the goals and methods could be spelled out by the leader. In contrast, the relatively unstructured task was more vague and ambiguous in goals and procedures and it provided the group with fewer points of reference in performing the assignment. This task also required a high degree of verbal interaction. A third completely non-verbal task was added to determine the extent to which language and communication problems interfered with performance. To assure proper motivation, a prize of 500 Belgian Francs (\$10) was offered to each man in the four best groups. These prizes noticeably increased the men's interest in the tasks.

The Unstructured Task. As in previous studies, the unstructured task consisted of a group activity which demanded a creative product. The men in the present study were told that their committee was to devise a recruiting letter for boys of sixteen to seventeen years of age, urging them to enlist in the Belgian Naval Forces. The letter, written either in French or in Dutch, was to be completed in 25 minutes (plus five minutes for writing it in final form), and it was to be no more than 250 words in length. The men were told that the letters would be judged in style and form as well as persuasiveness and originality.

Prior studies, using American college students and adult participants in leadership training workshops, required the groups to invent a fable, tell a story for children, or prepare a skit. However, the officers of the Naval Training Center advised against such a completely unstructured task since they considered it possible that the petty officers and the men would resist working on a problem which did not have considerable face-validity. For this reason, it was decided to make the test somewhat

more structured task than would be otherwise desirable.

Criterion ratings. Dutch and French letters were rated by separate groups of judges depending upon the language of the letter. The raters were professional psychologists or students with advanced graduate standing. They were given a short training period to acquaint them with the five dimensions on which each letter was to be judged. These dimensions, to be rated from 1 to 10, and the directions for rating are given below:

1. Well written versus poorly written, sloppy, awkward. This scale should gauge the degree to which a product is "good in a literary sense", the extent to which it is well written. High on this scale would be a product which, independent of its content, is presented in a readable fashion, with correct sentence structure, grammar, and word use. Exceptionally good style should be rated 10. Very awkward wording and poor style should be rated 1.

2. Understandably presented versus confused, incomprehensible. This scale reflects the degree to which the written product can be read and understood easily. There should be no doubt as to the meaning of each sentence, phrase, and paragraph. Lowest on this scale should be products that need to be read several times before the reader can get any meaning from them. The emphasis is on mode of presentation; content per se is here irrelevant.

3. Interesting versus boring. How well does this letter capture the reader's attention? To what extent is this "old stuff" and to what extent is this something which is exciting, which is colorful, and which makes you want to hear more? The emphasis here should be on the colorful language, a sense of excitement, and the interest which the letter evokes.

4. Persuasive versus unconvincing. This scale reflects the degree to which the letter evokes the feeling that the Navy life is a desirable, interesting, and worthwhile one. If the letter makes you want to join the Belgian Navy this very moment, it is an excellent one. The letter should be given a low score if it leaves you completely unconvinced, or unwilling to join that sort of organization, especially if it also would make you want to discourage others from joining.

5. Original, creative versus trite, platitudinous, commonplace. Consider here the degree to which the letter is original and new in its approach. Letters which sound trite and "tried" should get a low score; letters which are new and somewhat offbeat and which show originality of approach and ideas should get a high score.

The ratings for each letter were summed over eight French-speaking and seven Dutch-speaking judges. The reliability of this criterion, based on interrater agreement was estimated to be .36 for the French-speaking and .92 for the Dutch-speaking judges (Cronbach, Gleser, and Rajaratnam, 1963). Because of differences in the means and variances of scores given by French- and Dutch-speaking judges, the ratings were converted to T scores.

The Structured Tasks. Two structured tasks were administered, always in the same order. These tasks followed the model of the classic salesman's route problem; the groups were required to find the shortest route for a ship which had to touch at ten ports (or twelve in the second task), given certain fuel capacity and required legs of the journey.

The task material was presented on three different sheets, making it impossible for one person to complete the task without help from the other two team members. The group received a map of the ports which had to be covered. A second sheet contained a matrix of distances between all ports, and a third sheet gave detailed instructions and required the listing of

ports and mileages for each leg of the journey. Each of the two structured tasks was to be completed in twenty minutes. The team which computed the shortest mileage was given the best score.

We originally had hoped that the two structured tasks would be highly correlated and that the scores could, therefore, be added to increase the reliability of this criterion. Although these were clearly parallel problems, the correlation between the tasks was only .14 and each of the tasks, therefore, had to be treated separately. The first structured task turned out to be less satisfactory than the second task: nine of the groups obtained a perfect score and, therefore, had tied ranks. At the same time 62 of the 96 groups made a total of 109 routing errors by "running out of fuel", forgetting to make required legs of the journey and omitting one or more ports, as against 42 groups with 63 errors on the second structured task. The second task, therefore, appears to be a methodologically better measure of group performance.

There was no objective way by which error penalties could be assessed. A reasonable penalty had to be large enough so that the team would not profit by its errors; it had to be sufficiently small so that a relatively minor error would not disqualify a team which otherwise performed well. Each of three independent raters² devised a method for assessing error penalties which considered the magnitude of the error in terms of the advantage the group would derive from it, and added appropriate additional mileage as correction and penalty. Thus, one method used as the base the average distance to the nearest refueling base, another computed the exact mileage from the refueling port to the ship and back on the theory that it would

²We are indebted to Paul Ninane and R. Noel for their assistance. The author was the third rater.

have required a fuel tanker to go out and back to refuel the ship. The third method added a penalty of 100 miles for the first and 200 miles for the second task, since this figure approximated somewhat more than the average mileage which the ship would have gained by its errors.

Despite the fact that the three ratings were based on different error penalties, they intercorrelated .86, .93, and .95. These corrected ratings were, therefore, summed as the total score received by the team on the second structured task. In view of the high rater intercorrelations the score for the first task was based only on scores given by the rater whose judgments had correlated most highly with the other two ratings. As in the unstructured task, the raw scores obtained by the teams were converted to T scores with a mean of 50, and a SD of 10.

The Non-Verbal Task. The final task in the series differed in several respects from the structured and the unstructured tasks. This task was designed to be a completely non-verbal co-acting task situation. It was included to determine whether possible differences between homogeneous and heterogeneous groups were due to factors of language alone or to attitudinal factors as well.

The group leaders had previously been given several hours of training in field stripping and reassembling a .45 caliber automatic pistol. They were now asked to imagine that they were in charge of a NATO unit composed of men who did not speak their language. The leader's job was to train his men in field stripping and assembling the hand weapon in a ten-minute period. The group members were then given a blueprint of the various components of the weapon, and they were to indicate the order in which the parts were to be disassembled and reassembled.

The sum of the two members' scores constituted the criterion. The correlation between the two members' scores was fairly low (.35). Because of the poor criterion reliability the data could be used only in some of the cruder analyses.

Task Intercorrelations. The tasks of this study were designed to span the range of required verbal interactions. The letter-writing task obviously required a high level of verbal communication in which cultural and linguistic background play an important part. This type of interaction will be at a minimum in the pistol assembly task in which no verbal communications take place, and it will be intermediate in the structured ship-routing problems.

The intercorrelation among the four performance scores is shown on Table 3. As can be seen the tasks are essentially independent. On the face of it, this seems somewhat surprising, especially in the case of the two structured tasks which are essentially identical. The correlation between these two tasks is only .14, somewhat less, than the correlation between the first structured task and the unstructured task, though none of the relations are significant. These findings are, however, quite consistent with the hypothesis of the Contingency Model.³

Post-Session Questionnaires

At the conclusion of each task session all participants completed a number of questionnaires and scales designed to measure the group members' reactions to the tasks and to permit some inferences about the group processes during the session. A subsequent report will deal with these group process variables. The present paper will discuss only the questionnaires immediately relevant to the understanding of the factors determining group effectiveness.

³On the basis of the Contingency Model we would expect different leader performance depending on whether the group task situation is more or less favorable for the leader. The second task presents an easier situation for the leader since his previous exposure to the task enables him to direct the group more effectively. Since leadership style and favorableness of the situation interact, the model predicts low group task intercorrelations.

Table 3

Intercorrelations Among Group-Task
Performance Scores^a

| | UT | ST I | ST II | NVT |
|-------|----|------|-------|-----|
| UT | -- | .20 | .03 | .14 |
| ST I | | --- | .14 | .13 |
| ST II | | | -- | .10 |
| NVT | | | | --- |

^aUT = Unstructured task; ST I = 1st Structured task; ST II = 2nd Structured task; NVT = Nonverbal task.

Of major importance among the post session questionnaires is the Group Atmosphere scale. This is a ten item questionnaire, similar in form and content to the LPC scale, on which leaders and members were asked to describe the degree to which the group seemed friendly or unfriendly, warm or cold, accepting or rejecting.⁴ The internal consistency of the scale was over .90. Leaders and members apparently tended to judge group atmosphere on the basis of different criteria since the correlations between group members' and leaders' scores were fairly low in each of the three tasks (.35, .31, and .43). Yet, a group tended to have consistently good or poor group atmosphere, as indicated by the high intercorrelations among the three sessions, namely, .76, .73, and .83.⁵

Additional scales of importance in this report were a 20-item, eight-point Behavior Description Questionnaire (BDQ) and a 16-item Member Reaction Questionnaire of the same format. The former contained items designed to describe the leader's directive, structuring, task-oriented actions as well as person oriented behavior labelled by Hemphill as "considerate" (1957). The second questionnaire was used to measure the leaders' and group members' reactions to the sessions. It included items on the individual's feelings of interest, motivation, anxiety and frustration with the task and his group.

⁴The remaining items were: friendly-unfriendly; accepting - rejecting; satisfying-frustrating; enthusiastic-unenthusiastic; productive-nonproductive; warm-cold; cooperative-uncooperative; supportive-hostile; interesting-boring; successful-unsuccessful.

⁵Group Atmosphere scores are interpreted as conceptually related to good leader-member relations indices derived from sociometric preference questionnaires in real-life groups. However, the correlation between GA and sociometric indices was fairly low in this study. We tentatively interpret this finding as an indication that the leader of the real-life groups experiences the degree of his acceptance by his group as a result of his interaction with his group members. In ad hoc groups, which meet at most for a few hours, the leader generally cannot obtain this feedback. He will, therefore, act on the basis of his own feelings toward the group and the group is likely to go along with him for the duration of the experiment.

Finally, participants were asked to describe each of the other members of their group. These interpersonal perception scales, identical to those for obtaining LPC scores, yielded esteem scores for leader and fellow group members.

The items from the post meeting scales and questionnaires given after the structured and unstructured task resulted in 38 factorially identifiable clusters. Analysis of questionnaires given after the non-verbal task did not include the BDQ, and resulted in 14 clusters. A subsequent factorization of these clusters yielded five clearly identifiable factors in the case of the structured and the unstructured tasks, and two in the case of the non-verbal task. Of importance to the present discussion are the leader's group climate factors which were used to determine the affective leader-member relations required for the test of the Contingency Model. The items most heavily loaded on the Group Climate Factors are given on Table 4 along with corresponding factor loadings.

Only the leader's Group Atmosphere scores based on the 10-item scale have been used in our previous creativity studies as the main index of good or poor leader-member relations, and groups were customarily divided into high and low leader-member relations on the basis of these scores. (Dividing the groups on the basis of the members' scores has led to considerably less satisfactory results in our previous studies.) The group climate scores used in this study undoubtedly represent a more general and reliable measure of the group climate as perceived by the leader. They were here utilized to subdivide groups seen by the leader as pleasant and relaxed from those perceived by him as unpleasant and tense. While this method of dividing groups on their leader-member relations is less elegant than would have been an experimental manipulation to assure congenial groups, the design of the study was too complex at this point to permit the introduction of this additional variable into the design.

Table 4

Factor Loadings of Scales and Clusters of the
Leader Group Climate Factor

| Scale or Cluster | Factor Loadings | |
|---|---------------------|---------------------|
| | Unstructured Task | Structured Task |
| Leader Group Atmosphere Scale | .30 | .81 |
| Leader's Esteem for Members | .76 | .89 |
| Members' Satisfaction with Group | (-.01) ^a | .77 |
| Leader's Description of Members as Considerate | .69 | .73 |
| Leader's Satisfaction with Group | .66 | (-.08) ^a |

^a Parenthesized loadings were not included in the computation of factor scores.

The Effects of Group Organization and Composition on Performance

One purpose of this study was the comparison of teams in which the leaders and members share the same cultural background and language, and those in which members and leaders differ in these important aspects. This study also compared teams in which recruits worked under the leadership of petty officers and those in which recruits worked under fellow recruits. The working hypothesis was that homogeneous groups and those led by petty officers would be superior in performance to heterogeneous groups and to groups having recruit leaders.

Analyses of variance, one per task, were computed which compared groups on these variables as well as on three additional factors of leader LPC scores (three levels), group intelligence (two levels), and leader's mother tongue (two levels, i.e., French and Dutch). Table 5 presents the results (in T scores) obtained in the four main conditions. The significant analyses of variance results are summarized in Table 6. (See also Figure 1.)

The differences in the performance of these sets of groups, working under quite diverse experimental treatments were strikingly small. Only the group's intelligence level emerged as a significant main effect under all four task conditions. Since intelligence level of leader and group members was incorporated into the design as a control variable, these results were anticipated and hardly surprising. These highly significant relations show, however, that the criteria of performance are reliable and meaningful measures.

Three other significant F ratios were obtained.

1. On the unstructured task, which required the group to compose a recruiting letter, the homogeneous teams performed better than did heterogeneous groups. This result again was not surprising since the letter writing

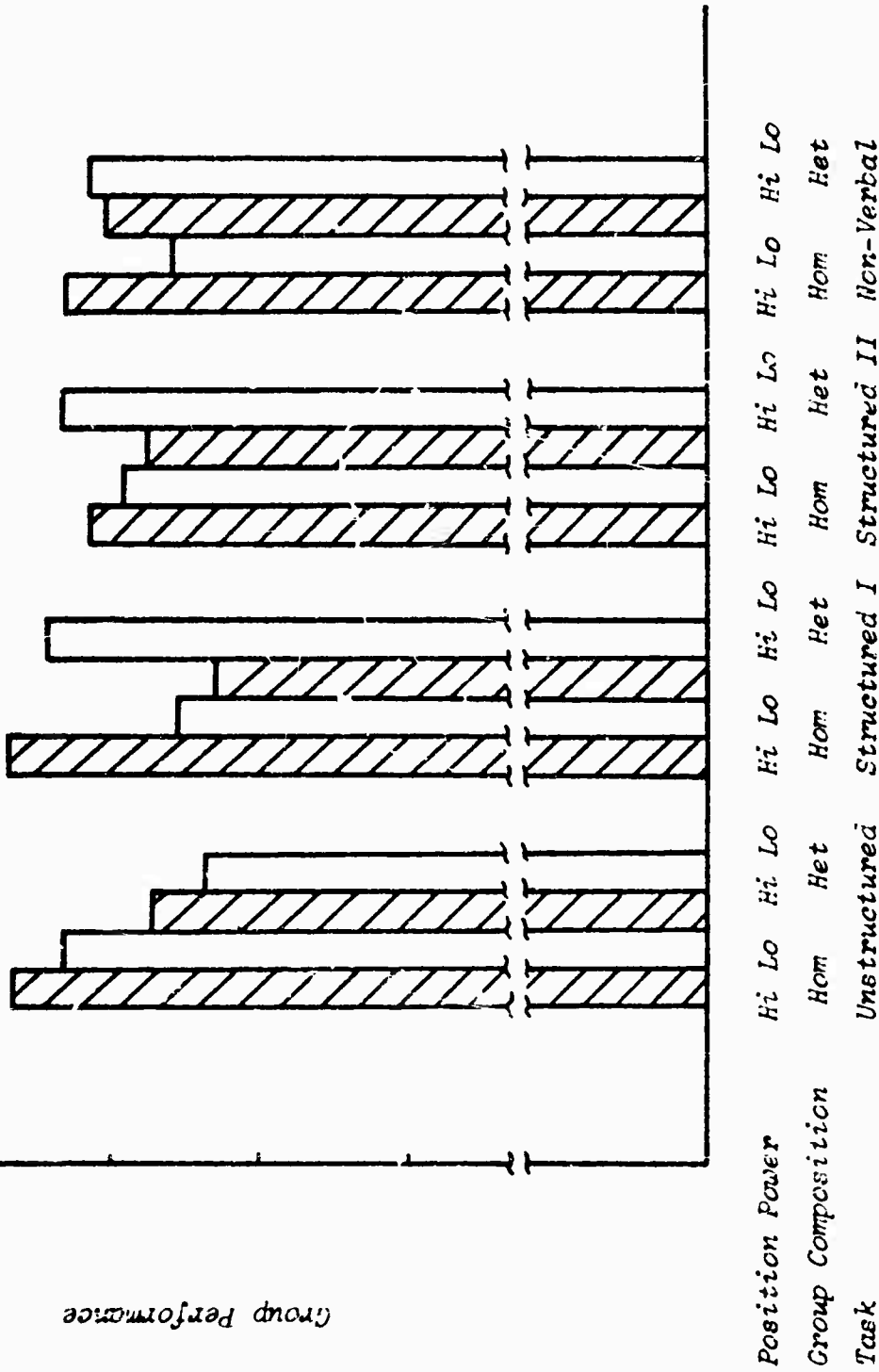


Figure 1. Performance of homogeneous and heterogeneous groups with high and low leader position power.

Table 5

Mean Task Performance in Standard Scores for Groups
Under Main Experimental Conditions

| Group Composition | Task | Position Power | |
|----------------------|---------------|----------------|-------|
| | | High | Low |
| Homogeneous | Unstructured | 53.10 | 51.55 |
| | Structured I | 53.20 | 47.32 |
| | Structured II | 50.25 | 49.24 |
| | Non-Verbal | 51.40 | 47.89 |
| Heterogeneous | Unstructured | 40.52 | 46.87 |
| | Structured I | 40.40 | 52.05 |
| | Structured II | 40.70 | 51.43 |
| | Non-Verbal | 50.04 | 50.60 |

Table 6

Analysis of Significant Variance Results
for Performance Scores

| | Mean Performance Scores | | F Ratio | P | % Variance |
|---------------------------|----------------------------------|---------------|---------|-----|------------|
| <u>Structured Task I</u> | 52.35 | | | | |
| | 47.12 | | 10.333 | .01 | 7.2 |
| | | | | | |
| | <u>Homogeneous Heterogeneous</u> | | | | |
| High Position Power | 53.21 | 46.50 | | | |
| Low Position Power | 47.33 | 52.19 | 11.890 | .01 | 8.4 |
| | | | | | |
| <u>Structured Task II</u> | | | | | |
| High IQ | 52.40 | | | | |
| Low IQ | 47.56 | | 4.480 | .05 | 4.5 |
| | | | | | |
| <u>Unstructured Task</u> | | | | | |
| Homogeneous | 52.35 | | | | |
| Heterogeneous | 47.71 | | 6.394 | .05 | 4.5 |
| | | | | | |
| High IQ | 54.00 | | | | |
| Low IQ | 46.06 | | 18.665 | .01 | 14.8 |
| | | | | | |
| <u>Non-verbal Task</u> | | | | | |
| High IQ | 9.75 | | | | |
| Low IQ | 7.33 | | 6.485 | .05 | 5.3 |
| | | | | | |
| | <u>High IQ</u> | <u>Low IQ</u> | | | |
| High Position Power | 3.92 | 9.00 | | | |
| Low Position Power | 10.53 | 5.75 | 6.948 | .05 | 5.8 |
| | | | | | |
| | t=1.253 | t=2.462 | | | |
| | p < .05 | p < .05 | | | |

task primarily demanded language and verbal communication skills. These requirements would be more easily met by groups in which all members speak the same language and hold the same cultural values than by groups in which the members are handicapped in communicating with one another.

2. A significant interaction between the leader's position power and group homogeneity occurred in the first structured task which involved routing a ship through ten ports via the shortest way. Homogeneous groups performed better under the leadership of petty officers than they did under recruit leaders, while heterogeneous groups performed better under recruit leaders than under petty officers.

Two explanations are suggested. (a) This finding may reflect the resentment which men might have felt because they had to work under petty officers from the other ethnic group - mixed teams are uncommon in the Belgian military services. (b) It may reflect the communication barrier between men of different rank which was further exacerbated by linguistic heterogeneity. In heterogeneous groups, in which the leader was, himself, a recruit the members may well have assumed more responsibility for the task, and they may have worked extra hard to overcome the communication difficulties which existed. The latter explanation seems more plausible. If the difference in performance had been caused by antagonistic attitudes, these attitudes should have played an even more important part in the second structured task or in the non-verbal task where similar results were not found. This suggests a difficulty in the group process that was amenable to learning or practice rather than one caused by deepseated resentments and antagonistic attitudes.

3. An interaction was also found on the non-verbal task, requiring the leader to instruct his men in disassembling and re-assembling an automatic pistol. The performance of men trained by dull recruits was substantially

poorer than that of men under bright recruits. However, bright recruits and bright petty officers did not differ in their leadership effectiveness. Since this was a fairly simple task, it is easy to see why the relatively dull petty officers would be as effective as the brighter petty officers, since these tasks were quite familiar to all petty officers. The relatively duller recruit leaders, on the other hand, undoubtedly had more difficulty not only in learning the assembly and disassembly procedures, but they also may have experienced more difficulty in teaching these procedures to their equally dull team members.

The results of this study obviously do not support the conclusion that groups with culturally and linguistically homogeneous membership perform better than culturally and linguistically heterogeneous task groups on all but highly verbal tasks. More importantly, this study fails to support the even more plausible hypothesis that task groups led by trained and experienced leaders with strong position power perform significantly better than teams led by inexperienced and relatively powerless leaders. The implications of these findings will be further considered in the discussion section of this paper.

Validation and Extension of the Contingency Model

The second major concern of this study was a test and extension of the Contingency Model (Fiedler, 1964). This model states that the leadership style required for effective performance of interacting groups is contingent upon the favorableness of the group-task situation: effective performance in very favorable and in very unfavorable group-task situations requires the managing, controlling style of the low LPC leader; situations moderately favorable for the leader require the permissive, considerate, non-directive style of the high LPC leader. The present study tests the Contingency Model and extends the research to heterocultural groups. The non-verbal task in which the work of one individual does not directly affect the performance of another is a co-acting group situation, and is, therefore, unsuitable for testing this model. Only the structured and unstructured tests are here considered for purposes of these tests.

Background of the Contingency Hypothesis

There has been considerable controversy in the field of leadership concerning the relative merits of directive, autocratic, versus non-directive, human relations-oriented attitudes and behaviors. The Contingency Model attempts to reconcile these two viewpoints. It postulates that the effectiveness of these particular leadership styles depends upon the degree to which it is "easy" or "difficult" to be a leader of a group under a particular set of circumstances.

Our previous research has used the Esteem for the Least Preferred Co-worker (LPC) and the Assumed Similarity between Opposites (ASo) score. The LPC and ASo scores, which are highly correlated (.80 to .90) measure permissive, non-directive, considerate versus autocratic, structuring, managing and controlling leader attitudes and behaviors (Fishbein, 1965;

Meuwese and Fiedler, 1965; Morris and Fiedler, 1964). These scores have predicted group performance in a wide variety of studies (Fiedler, 1958, 1964). However, the correlations were in the positive direction in some situations and in the negative direction in others. The Contingency Model predicts lawful relations if we classify group-task situations in terms of their favorableness for the leader.

Groups in our previous studies were tentatively classified on the basis of three dimensions. These were, in order of importance, (a) the affective leader-member relation (b) the task structure and (c) the power of the leadership position. These dimensions are here briefly described. Detailed operational definitions can be found in a previous paper (Fiedler, 1964).

Affective leader-member relations were operationally defined either by means of sociometric preference scores which indicate that the leader is the group's most preferred member, or by means of "group-atmosphere scales". The latter are bipolar adjective scales, similar to the Semantic Differential, on which the leader is asked to describe the climate of his group. A high leader group-atmosphere score indicates that the leader feels accepted by the group, and that he sees the group as friendly, relaxed, and free of tension. This dimension probably represents the most important aspect of the leader-member relationship, since a leader having the trust and confidence of his men can do what would be difficult for a disliked or distrusted leader.

Task structure, the degree to which the job can be spelled out or done "by the numbers", and hence controlled by the leader, was measured on the basis of four scales developed by Shaw (1962). These are (a) the task's goal clarity - the degree to which the desired outcome is specified; (b) its decision verifiability, the objectivity with which the outcome can be measured; (c) its solution specificity, whether there are one or many possible solutions; and (d) its goal path multiplicity - whether there are

one or many possible methods for reaching the goal (reverse scoring).

Position power indicates the degree to which an organization invests the leader with power to reward and punish, and the degree to which it gives the leader prestige (see French, 1956). It is distinct from the power the leader enjoys by virtue of his personal attraction or his ability to inspire loyalty and trust. Rather, position power is here defined as representing the formal power at the leader's disposal, irrespective of his ability or willingness to use it. This dimension can be reliably measured by means of a simple checklist (see Fiedler, 1964). Position power was considered to be the least important of these three dimensions in the groups we had previously studied: even low-ranking leaders can control a group if the task is spelled out in detail, and a well-liked leader does not require rank.

The classification of group-task situations. The three dimensions can be represented in the form of a cube. We can further arbitrarily subdivide each dimension into a high and low half, yielding an eight-celled figure (Figure 1). Thus, Cell I includes group-task situations in which the leader is, or feels, accepted by his group, in which the task is highly structured, and in which the leader's position power is relatively high compared to that of his members. Cell VIII includes group-task situations in which the leader is not accepted and has little power, and in which the task is ambiguous and unstructured.

A consideration of these eight group-task situations suggested that these cells could be further classified in terms of their favorableness for the leader. Ordering the cells first on the basis of leader-member relations, then on task structure, and finally on position power leads to a continuum indicated by the numbers assigned to the cells, with Cell I being most favorable, Cell II next most favorable, and so on to Cell VIII which is the least favorable pole on this continuum. We have in this manner classified

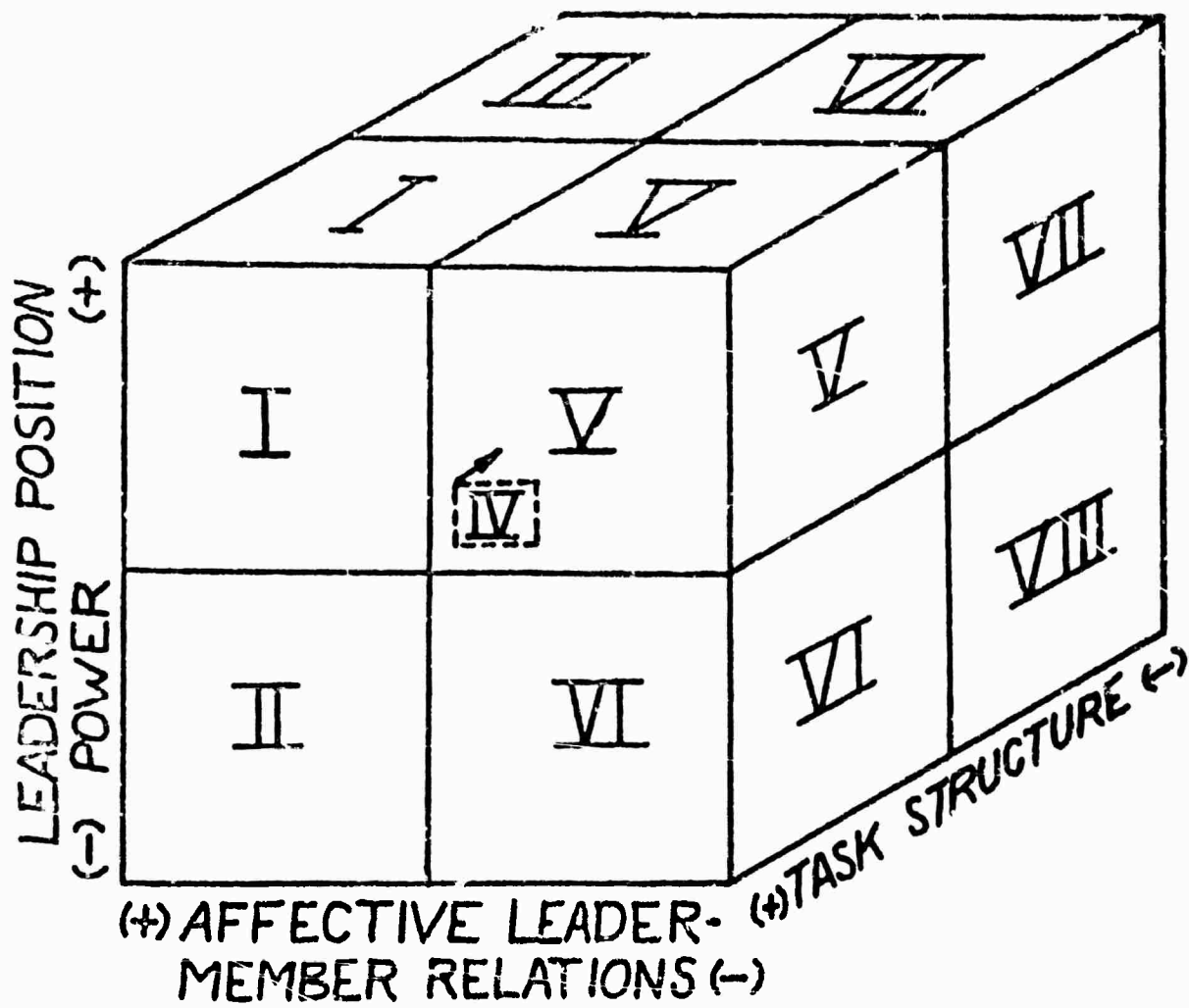


Figure 2. A model for the classification of group task situations.

a total of 58 different group-task situations from 15 different studies. A more detailed rationale and description of this procedure can be found in Fiedler (1964).

By ordering the eight cells according to their favorableness and plotting the correlations between leader LPC (or ASo) and group performance within each of the cells, we obtained the curvilinear performance curve shown in Figure 2. This plot shows negative correlations between leader LPC and group performance in Cells I, II, III and VIII, and positive correlations in Cells IV, V, and VI. In other words, the directive managing, structuring leaders (low LPC) tended to perform best in very favorable and in the very unfavorable group-task situation; the non-directive, permissive, considerate (high LPC) leaders performed best in situations intermediate in difficulty.

Tests of the Contingency Hypothesis

The critical problem of testing the model lies in ordering the group-task situations, represented by this experimental design, on the basis of their favorableness for the leader. Once this is done, the leader's LPC scores can be correlated with the performance scores of the groups within each of the cells.

Although we had started with the comparatively large sample of 96 groups, the number of cases within each cell shrank rapidly with each variable that had to be incorporated in the design. We obviously had to divide the groups on the basis of the original dimensions, namely, high versus low position power, task structure, and the group climate scores which measured affective leader-member relations. A further division was required on the basis of homogeneity versus heterogeneity.

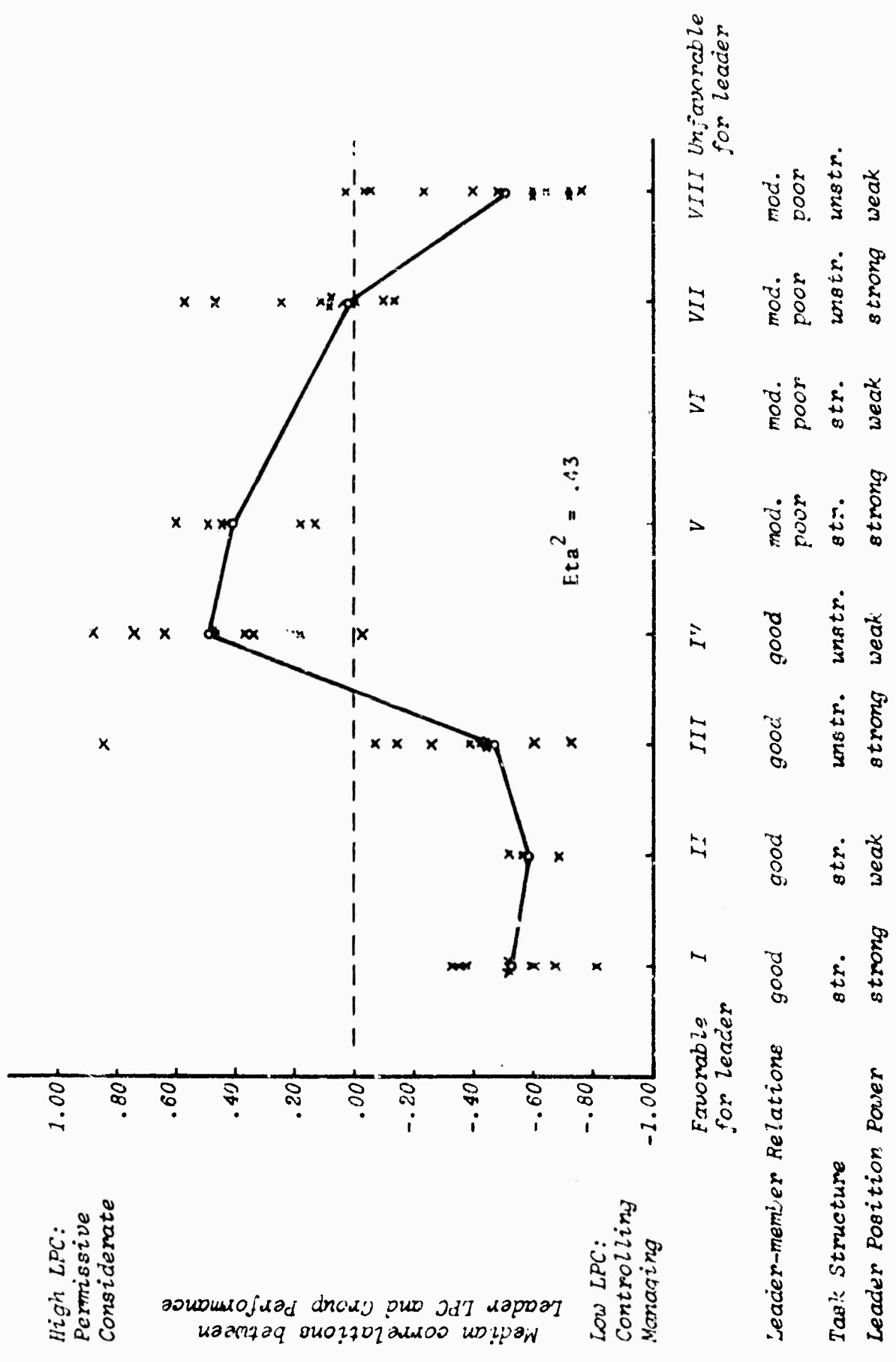


Figure 3. Correlations between leaders' LPC scores and group effectiveness plotted for each cell.

Four other variables in this study also had to be considered or statistically controlled: (a) the intelligence level of the leader and his group members played a major role in affective performance; (b) Differences were found between Dutch and French speaking groups; (c) The order of presenting the tasks affected the difficulty experienced by the leader (in the "second presentation" task, the leader had already learned to some extent how to work with his men); finally (d) The second structured task situation was judged less difficult than the first since some task learning and practice effects had occurred by that time.

Since we would run out of degrees of freedom needed to test the model it was essential to combine certain cells. For example, although intelligent groups performed better than did dull groups, differences in performance could be statistically controlled by means of co-variance adjustments. This procedure involved obtaining the mean difference between performance scores of the relatively bright and dull groups, and adding this difference to the scores of the dull groups. A similar adjustment was needed to equalize mean differences in the performance of French and Dutch speaking teams where such extraneous factors as differences in scoring standards in the two languages and clarity in translating the instructions, could have affected the results.

The order of task presentation, as already mentioned, affected the difficulty of the group-task situation, as did the practice effects that occurred on Structured Task II since the groups had performed an almost identical problem in the immediately preceding Structured Task I. These effects were considered in scaling the group-task situation.

The classification procedure, outlined above, categorized the 96 groups on the basis of (a) homogeneity versus heterogeneity, (b) high versus low leader group climate scores, (c) high versus low leader position power, (d) task presentation order beginning with the structured or with the

unstructured task. This classification generated 16 cells with six groups per cell. (Two of the 96 groups had to be discarded for purposes of this analysis because of a clerical error which misclassified two bi-lingual men in terms of their mother tongue, leaving five groups in two of the cells.)

Since the criterion tasks were uncorrelated and, therefore, presumed to be independent, correlations were computed separately for each of the tasks. The resulting 48 correlations (3 correlations for each of 16 cells) constitute the basic data for testing the Contingency Hypothesis.

These data are presented on Table 7. Column 1 of this table indicates the cells which were involved in the analysis, columns 2, 3, 4, and 5 indicate the characteristics of the particular cell. Thus, Cell DE consisted of homogeneous groups (col. 2) with high position power (petty officers) (col. 3), and groups which began the experiment with the structured task (col. 4). Dutch (D) and French speaking (E) groups were merged. The 12 groups were then divided into the six in which the leader had high group climate factor scores and the six in which he had low group climate scores (col. 5). The correlation between LPC of the leader and his performance on the unstructured task are listed in col. 6, those on the first and second structured tasks in columns 7 and 8.

The model requires that we order the group-task situations in terms of their favorableness for the leader. Three tests, each based upon a different method of ordering, are here presented.

Test I. Replication of the original model. The first test follows the method of categorization described in the development of the original model (Fiedler, 1964). It involves the categorization of groups on the basis of group climate scores, task structure (using the unstructured and second structured task), and position power of the leader, in addition to the main variable of homogeneity versus heterogeneity.

Table 7

Correlations Between Leader LPC and Group Performance

in Different Group-Task Situations^a

(N = 6)

| Cells ^b | PP | Order of Task Presentation | Leader's Group Climate | Weights Indicating Favorable-ness of the Group-Task Situation | | | | | | |
|--------------------|------|----------------------------|------------------------|---|-----|------|--------------------------------|-----|------|----|
| | | | | Split on Leader Group Climate | | | Split on Leader Task Situation | | | |
| | | | | UT | STI | STII | UT | STI | STII | |
| DE | Hom. | High | U | High | -16 | -20 | -77 | 9 | 11 | 12 |
| | | | Low | 26 | 36 | 16 | 6 | 8 | 9 | |
| HK | Hom. | High | S | High | -54 | 59 | -72 | 10 | 10 | 11 |
| | | | Low | -27 | -03 | 03 | 7 | 7 | 3 | |
| NO | Hom. | Low | U | High | 08 | 67 | 37 | 6 | 8 | 9 |
| | | | Low | -37 | 10 | 07 | 3 | 5 | 6 | |
| RS | Hom. | Low | S | High | 13 | -43 | 50 | 7 | 7 | 3 |
| | | | Low | 60 | -72 | 14 | 4 | 4 | 5 | |
| FG | Het. | High | U | High | 20 | -49 | 03 | 6 | 8 | 9 |
| | | | Low | -37 | 54 | 08 | 3 | 5 | 6 | |
| LM | Het. | High | S | High | -26 | -09 | 77 | 7 | 7 | 3 |
| | | | Low | 03 | 09 | -19 | 4 | 4 | 5 | |
| PQ | Het. | Low | U | High | -89 | -49 | 7 | 3 | 5 | 6 |
| | | | Low | -36 | -13 | 53 | 0 | 2 | 3 | |
| TU | Het. | Low | S | High ^c | 70 | -25 | -53 | 4 | 4 | 5 |
| | | | Low ^c | -60 | 30 | -90 | 1 | 1 | 2 | |

^aUT = Unstructured task; STI = First structured task; STII = Second structured task. PP = Position Power. U = Task presentation sequence beginning with the unstructured task. T = Task presentation beginning with the structured task.

^bSee Table 1 for Cell designation.

^cN's = 5.

Figure 4 shows the performance curve based upon these data, abstracted for this purpose from Table 7. The curve is drawn through the medians of the correlations representing each cell.

As in Figure 2, showing the original performance curve of the Contingency Model, the plot, based on the present study, is curvilinear. However, the point by point correspondence is far from satisfactory. The curve in the Belgian navy study reaches its highest point in Octant II, while the original curve peaked in Octants IV and V. Octant VIII of the original curve showed high negative correlations between leader LPC and performance, while the corresponding correlations in the present study do not become negative until the much more unfavorable situations presented by heterogeneous groups.

The differences between these two curves may well be due to the special conditions under which this experiment was conducted. The differences in position power between petty officers and men was undoubtedly greater in the Belgian military teams than in civilian groups or even in American military crews which we had studied before. On the other hand, the difference between the structured and unstructured tasks seemed to be considerably less important in this than in previous studies.

Test II. Separate tests for structured and unstructured tasks. This test does not make any assumptions about the relative difference in group-task difficulty of the structured and unstructured tasks and, therefore, treats the tasks separately. The method does assume an order of importance in major factors affecting favorableness, and that this order would be (a) group homogeneity versus heterogeneity (b) leader group climate, and (c) position power. The median correlations between leader LPC and group performance for the unstructured and the second structured tasks are plotted on Figure 5 and clearly indicate the curvilinearity of the relations.

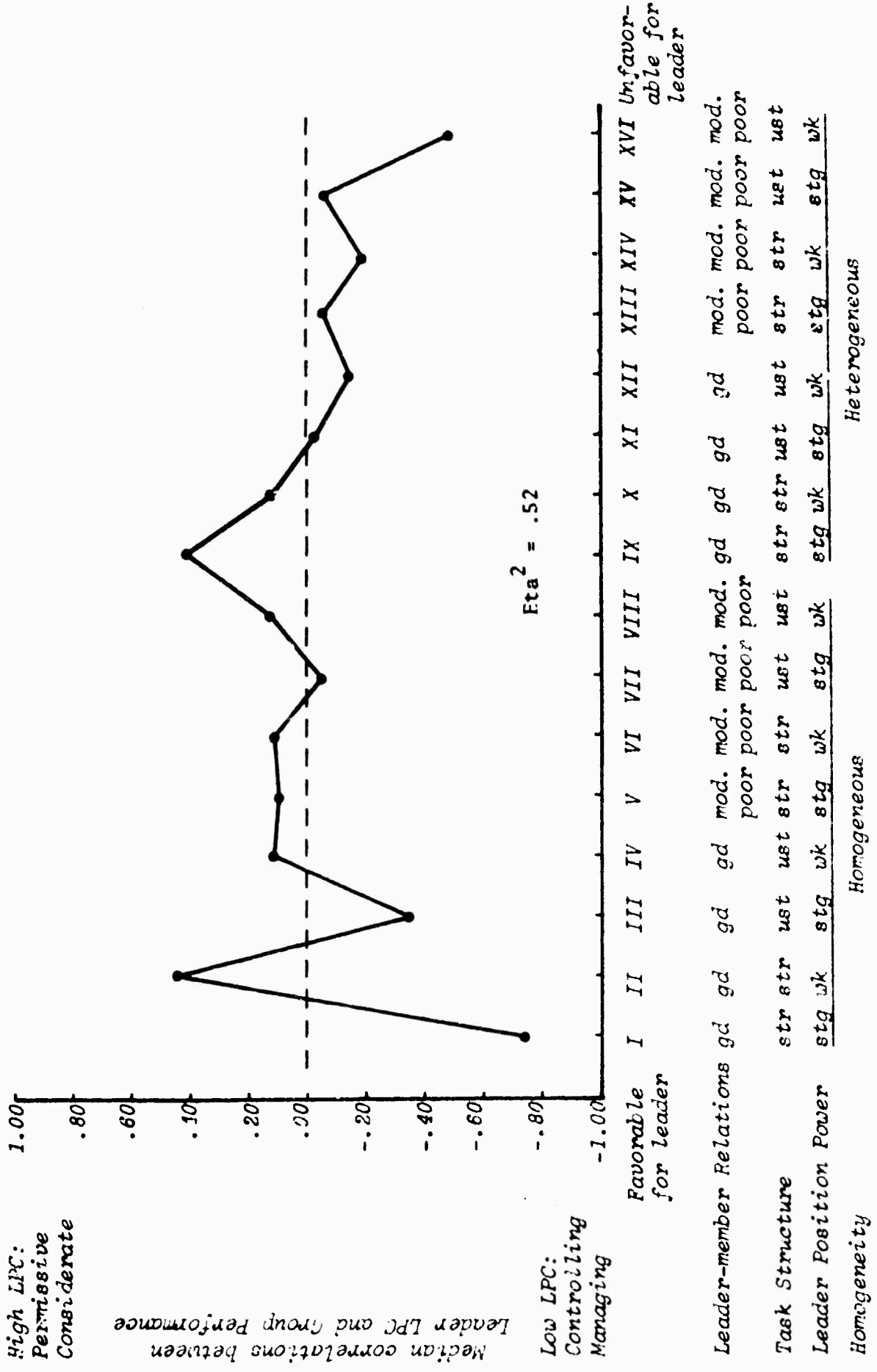


Figure 4. Correlations between leader LPC scores and group performance for homogeneous and heterogeneous groups, following the original classification of group-task situations presented in Fiedler (1964).

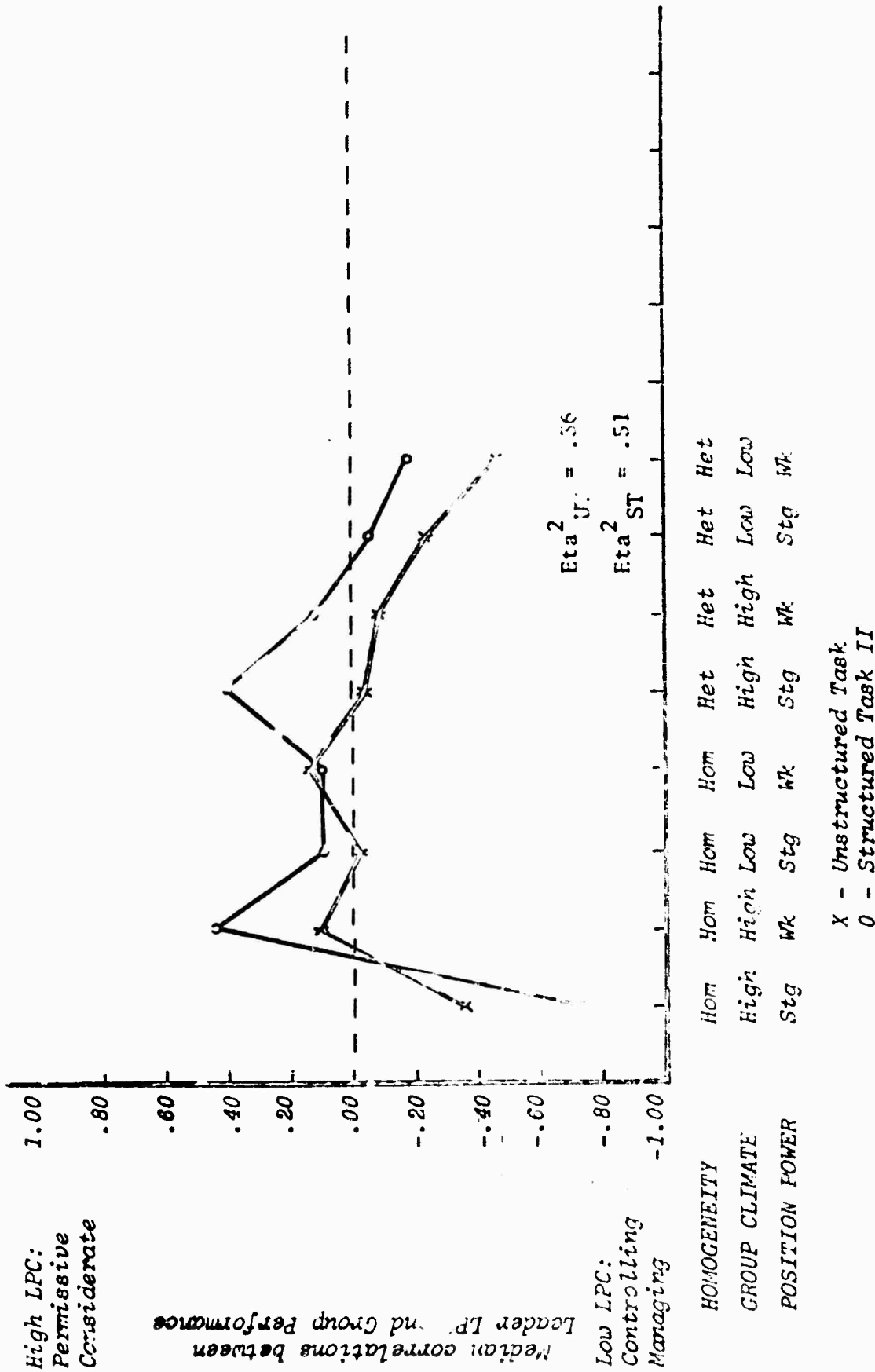


Figure 5. Correlations between leader LPC and group performance in unstructured and second structured tasks, classified by 'mogeneity, group climate and position power of teams.

Test III. Scaling of group-task situation factors. The third test of the model takes account of all the factors in the experiment which are likely to affect the favorableness or difficulty of the leadership situation. These factors include not only homogeneity, leader group climate, position power and task structure, but also the order of task presentation and learning and practice effects favoring the second over the first structured task.

The group-task situations were scaled in terms of their favorableness for the leader by assigning weights to each of the relevant factors on the basis of judgments which were made by several coworkers and the writer after the groups had been run, but prior to the analyses of all the data. This test of the Contingency Model was specifically tailored to the particular conditions which the experiment incorporated. This enabled us to apply the hypothesis in a psychologically more meaningful fashion. This test, being in part a posteriori requires further validation.

The method of scaling gives a weight of three points, each, to group homogeneity, high leader group climate, and high leader position power. A weight of one point was assigned to the first structured task; an additional point was given to the second structured task since it benefitted from learning and practice. Finally, one point was given to the tasks in the second presentation since the leader and members had by then had an opportunity to work together as a team.

The resulting weights for each of the cells are listed in Columns 9, 10, and 11 of Table 7, for each of the three tasks.⁶ The performance curve on Figure 6 is drawn through the medians of the correlations between leader LPC and performance corresponding to each scale point. As can be seen, this curve clearly follows the prediction of the Contingency Model, showing that the low LPC leaders were most successful in very favorable and very unfavorable conditions, while the permissive, non-directive high LPC leaders performed best in situations of intermediate favorableness. Heterocultural groups tended to fare better under low LPC leaders.

The curve, based only on the first structured task (Figure 7) is flat with correlations between leader LPC and group performance close to zero. Whether this is due to the factors operating in this particular task session or to the methodological weakness of the performance scores for this task cannot be determined.

The separate curves for the unstructured and second structured tasks are curvilinear as predicted (Figures 8 and 9). Table 8 summarizes these data. It is interesting to note that the performance curve of the unstructured task peaks at a scale point corresponding to a less favorable group-task situation than is the case of the second structured task. These curves would have overlapped if we had not allotted two extra scale points to the weight of the second structured task above those given to the unstructured task. This

⁶ For example, the weight for the groups in Cell DE with high group climate and the Unstructured Task is 9. This weight was obtained by adding points as follows: homogeneity, 3; high position power, 3; task presentation starting with the unstructured task, 0; unstructured task, 0. Total weight equals 9. The weight for the groups in Cell DE with low group climate working on the first structured task would be 8. This was obtained by adding 3 points for homogeneity, 3 for high position power, 1 for the task presentation which started with the unstructured task, and 1 for the first structured task.

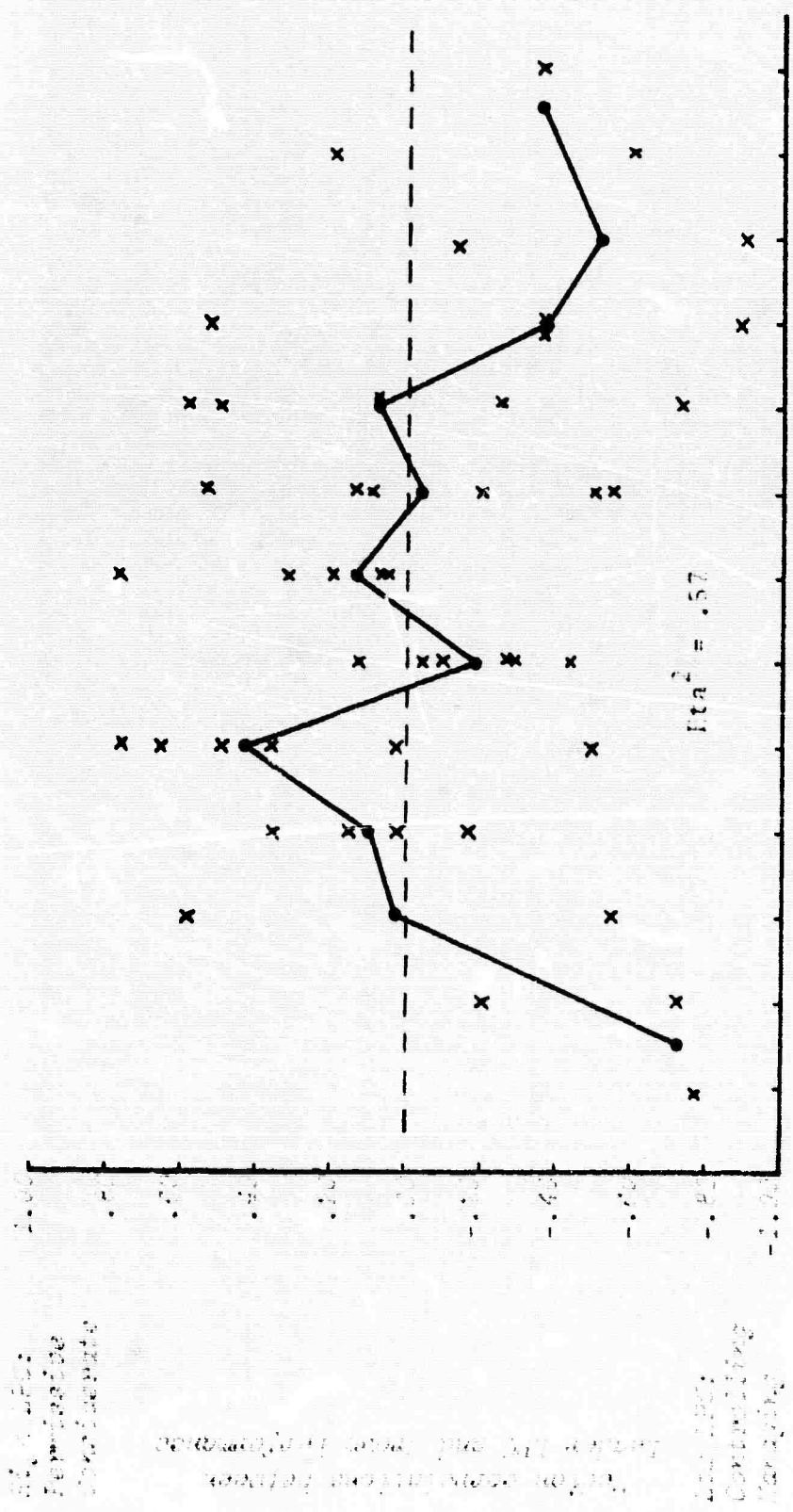


Figure 6. Performance curve indicating the relationship of leader LPC and performance with task-group situation difficulty for all tasks, split on leader group climate factor.

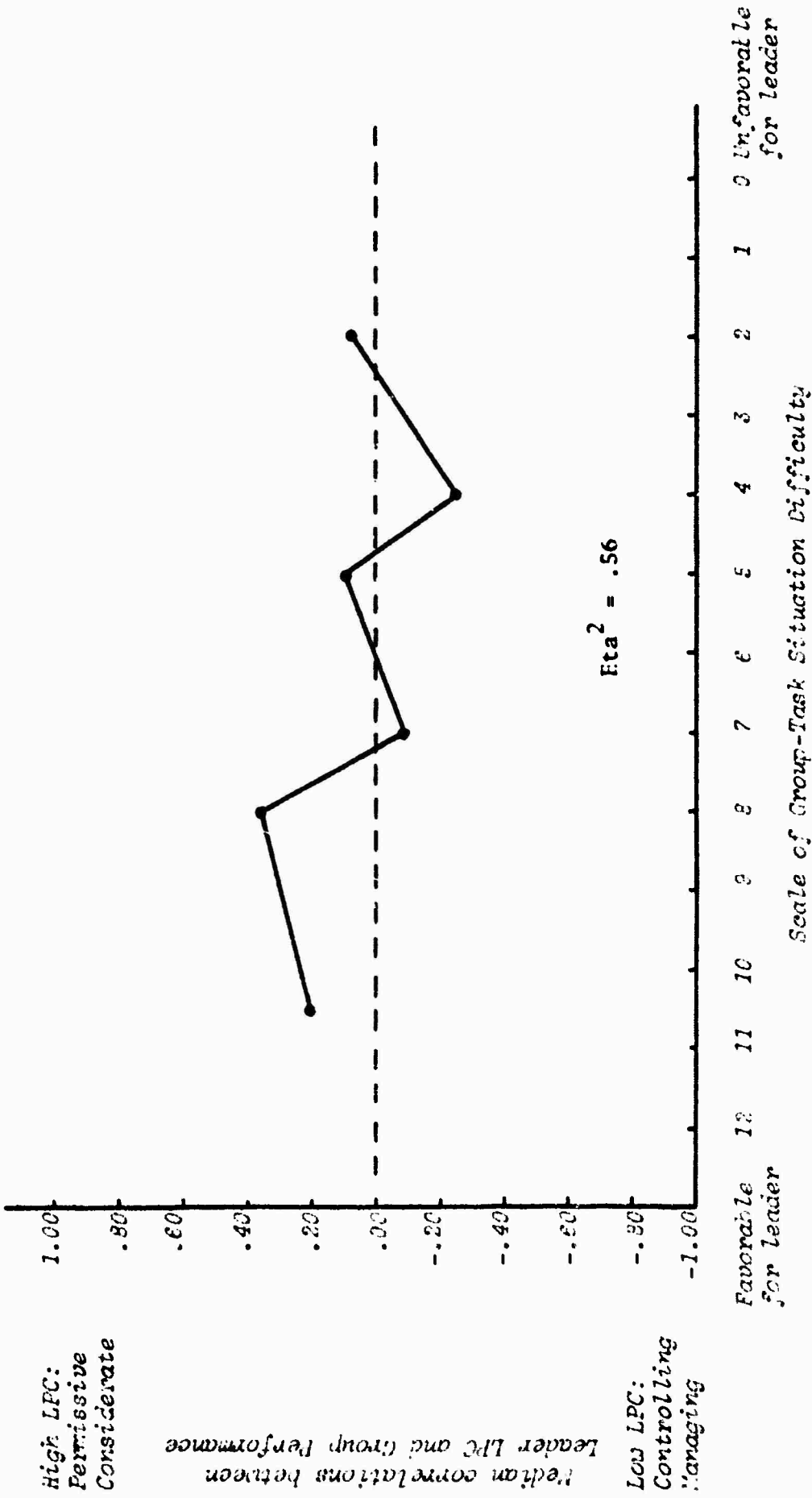


Figure 7. Performance curve indicating the relationship of leader LPC and performance with group-task situation difficulty for the first structured task, split on leader group climate factor.

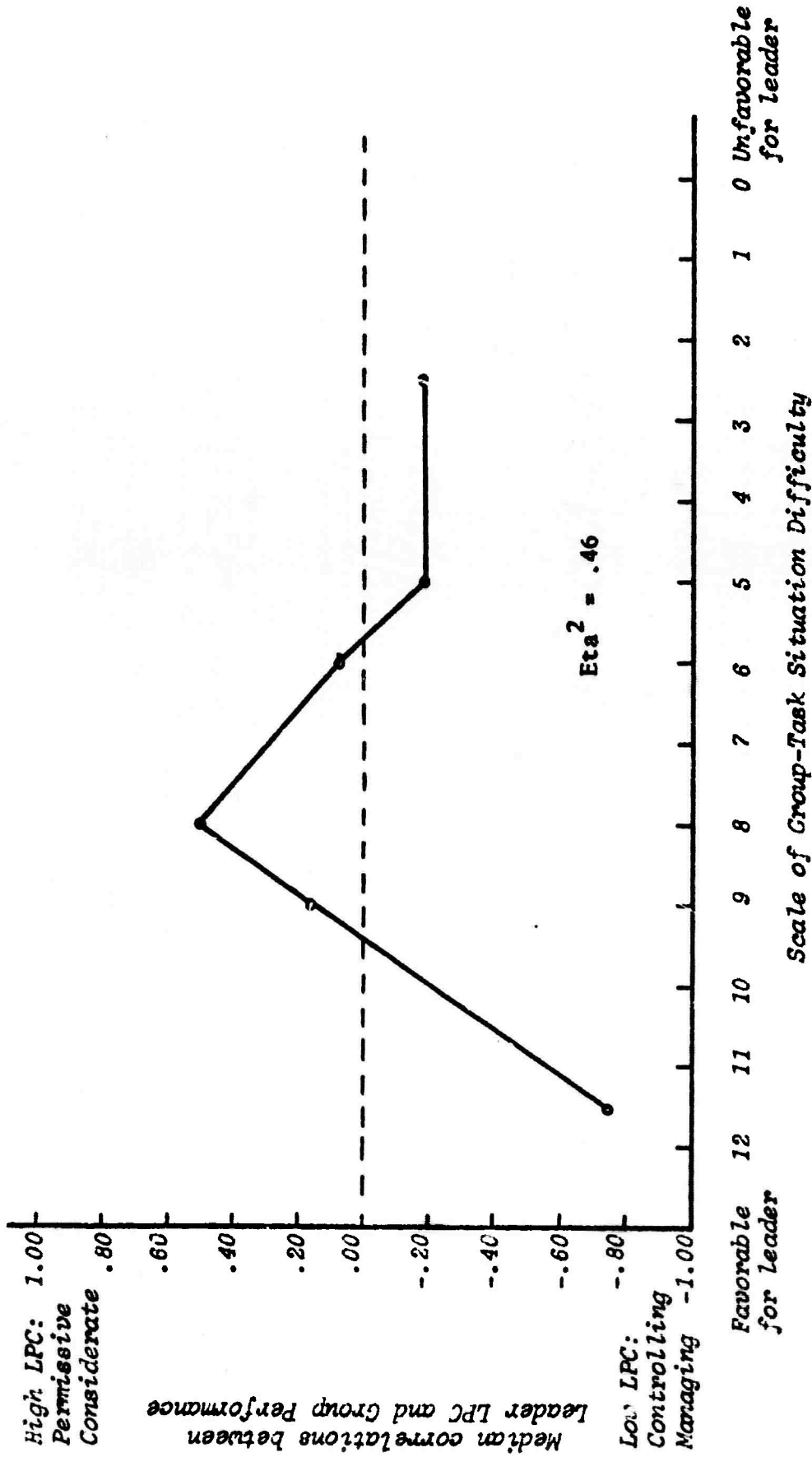


Figure 8. Performance curve indicating the relationship of leader LPC and performance with group-task situation difficulty for the second structured task, split on leader group climate factor.

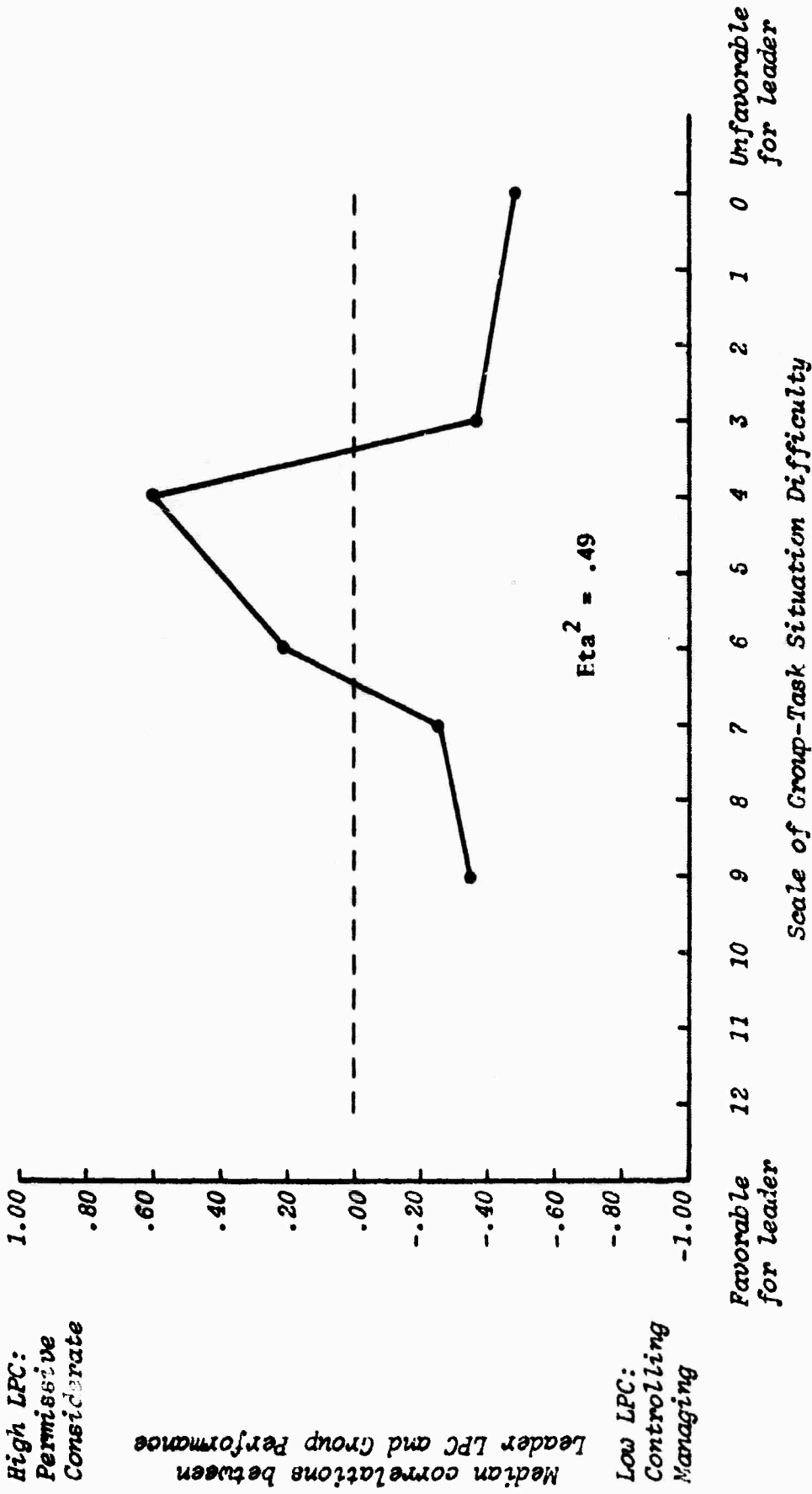


Figure 9. Performance curve indicating the relationship of leader LPC and performance with group-task situation difficulty for the unstructured task, split on leader group climate factor.

Table 8

Correlations Between Leader LPC and Group Performance

Ordered by Weights and Tasks

(N = 6)

| | Unstructured Task | Median Correl. | Structured Task I | Median Correl. | Structured Task II | Median Correl. | Grand Median Correl. |
|----|----------------------|-------------------|----------------------|-------------------|-----------------------|-------------------|----------------------------|
| 12 | | | | | -.77 | | |
| 11 | | | -.20 | | -.72 | -.74 | -.72 |
| 10 | -.54 | | .59 | .20 | | | .02 |
| 9 | -.16 | -.35 | | .20 | .37 .16 | .03 .16 | .17 |
| 8 | | | .67 .36 | -.49 .30 | .50 .03 | .77 | .43 |
| 7 | .13 -.27 | -.26 -.20 | -.43 -.03 | -.09 -.09 | | | -.17 |
| 6 | .08 .26 | .20 .20 | | | .77 .00 | .07 | .14 |
| 5 | | | -.49 .54 | .10 .10 | -.53 -.19 | .14 | -.04 |
| 4 | .70 .08 | .60 .60 | -.25 .09 | -.72 | | | .08 |
| 3 | -.89 -.37 | -.37 -.37 | | | .53 | | -.37 |
| 2 | | | -.13 | | -.90 | -.18 | |
| 1 | -.60 | | .30 | .00 | | | |
| 0 | -.36 | -.40 | | | | | -.36 |

finding again supports our belief that the difference between the structured and unstructured tasks in this study was quite small. A more adequate method for scaling group-task situations is obviously required for better prediction of group performance in future studies. In general, however, the results of this and the previous analyses support the hypothesis of the Contingency Model.

Discussion

The first part of this study tested two hypotheses. These were (a) that culturally and linguistically homogeneous teams would perform more effectively on various tasks than would heterogeneous teams, and (b) that groups under powerful as well as experienced and trained leaders would perform better than teams under weak, inexperienced and untrained leaders. The fact that the results supported neither hypothesis throws doubt on some fundamental assumptions in this area.

Group heterogeneity. The importance of good communication for group effectiveness has been a keystone in social psychological theories. Shaw (1964), in reviewing research on communication networks says:

"Communication lies at the heart of the group interaction process. No group, whether an informal or formal organization such as an industrial unit, governmental body, or military group, can function effectively unless its members can communicate with facility . . . The free flow of information among various members of a group determines to a large extent the efficiency of the group and the satisfaction of its members." (pp. 111-112)

According to this widely held assumption, group performance should suffer in teams with poor communication. This should be even more true in groups in which negative, hostile interpersonal attitudes are present. As indicated before, the men in homogeneous groups shared the same cultural heritage, they shared common attitudes, and they spoke the same language. The men in heterogeneous groups came from one ethnic background while their leader came from another; the men and their leader were raised in different languages, and they held negative attitudes toward each other's ethnic groups. Since most participants were only marginally competent in the other national language, there can be little doubt that the heterogeneous teams were severely handicapped in their verbal interaction. This contention is supported not only by common sense expectation and observer judgments, but also by the questionnaire responses obtained after each session.

Despite these handicaps, the heterogeneous teams performed as well as homogeneous groups in all but the letter writing task which demanded a high degree of verbal facility. These results suggest the need for reevaluating the importance of the communication variable in group interaction. Poor communication and antagonistic interpersonal relations might be very important in determining how well members like the group and their teammates. The effect of communication difficulty on group effectiveness needs to be reevaluated in terms of the specific aspects of communication which do and do not affect the performance of the team.

Leadership training and experience. The comparison of petty officers and recruit leaders in this study raises an equally important issue. It is generally assumed that leadership training and experience will increase the effectiveness of leaders (Hare, 1962, p. 390). Trained and experienced leaders should not only be more skillful in handling personnel and administrative problems within their teams but they should also be instrumental in obtaining more effective group performance. Interestingly enough, only a

very small number of studies have compared the performance of groups the leaders of which had been given leadership training and those which have not. The majority of studies in this area evaluated the effectiveness of leadership behavior rather than the effectiveness of group performance (Barnlund, 1955; Harris and Fleishman, 1955). One of the few is a study by Maier (1953) that compared 44 four-man groups with trained discussion leaders and 36 similar groups with untrained leaders. The task consisted of a role playing situation which was rated as having been successful if the leader's decision was accepted but unsuccessful if the leader's decision was not accepted by his group. Maier's study does not deal with group performance in our sense of the word. A study by Harris and Fleishman (1955) failed to show that foreman training increased work crew effectiveness, which is supported by our present findings.

In the present study, as we pointed out before, Belgian petty officers are career men who enjoy considerable prestige and status. The average petty officer in our sample completed two years of leadership and technical training in petty officer candidate school, which is quite comparable in quality and intensity to similar training in the United States. He also had about ten years of leadership experience behind him. This compares with the recruit leaders, most of whom were only 20 years old and therefore untrained and inexperienced in Navy leadership. Moreover, the experimental design gave additional prestige and power to the petty officers by letting them have the final voice on all group decisions, and by giving task instructions for heterogeneous groups in the leader's mother tongue. Petty officers were in fact more highly motivated than were recruit leaders. Despite these advantages, favoring the petty officers, neither their training and experience, nor their prestige and position power enabled them to perform significantly more effectively than the untrained, inexperienced recruit leaders. These results are rather startling when we consider the time and energy which the armed services devote to leadership training.

A number of questions must be asked before these results can be accepted at face value. First, could the tasks in this study have been unrealistic or unfair to petty officers? This would certainly not be the case for the non-verbal, pistol assembly task. The training of recruits is one of the main functions of petty officers at Ste. Croix-Bruges. While the pistol assembly training was to be conducted in silence, this did not seem to handicap the petty officers more than the recruit leaders. The other tasks are also not very far removed from those common in the military services. Petty officers and their clerks are not infrequently called upon to draft reports or letters. The ship routing task was basically no different from such military tasks as laying out a supply-truck route or a cross-country march, or devising a system which will most efficiently accommodate scarce classroom space for a training program. In any case, not one petty officer or recruit complained that the tasks had been unfair or unreasonable, and most said that they enjoyed the problems.

A related argument could be advanced that petty officers and recruits should not be compared on any but routine Navy problems for which petty officers had received special training. This would imply, however, that leadership skills taught in military schools and acquired through experience are not transferable to new situations. In that case, however, there would be no need for leadership training as it is now conducted by the armed services and most industrial and governmental institutions.

Could it then be that the recruits were overawed by the high ranking and prestigious petty officers, or unwilling to cooperate with them? Post-meeting data do not support either of these contentions. The men liked to work with petty officers as well as they did with recruits, and communication in groups led by petty officers was rated better than in recruit-led groups. Leadership training and experience may, therefore, improve the men's satisfaction but not their team performance.

Finally, it might be pointed out that the results were obtained on brief tasks given to ad hoc groups. This point is valid and limits the generality of our findings. For what it is worth, we may note that the petty officers' performances did not improve proportionately more from the first to the second structured task than did the performances of recruits. Whether the petty officers' performance would have improved over that of recruit leaders in tasks extending over much longer periods of time is a question for further research. However, the petty officers, who already had considerable experience and training are not likely to gain much, while the untrained recruits would be expected to gain proportionately more. Hence, additional time and experience would be an advantage to recruit leaders, rather than to petty officers. In the meantime, however, the data lead us to conclude that extensive training and experience of the leader, at least in ad hoc groups, did not contribute to group effectiveness. These findings point to a pressing need for further research on this problem.

Test of the Contingency Model. The second major purpose of this study was the test and extension of the leadership theory proposed in a recent paper (Fiedler, 1964). The data clearly support the major hypothesis of the Contingency Model, although there are point by point discrepancies from the predicted curves. Whether these discrepancies in the shape of the curve are due to the specific peculiarities of the sample and the experimental conditions of the Belgian study, or to the inadequacies of the theory, will need to be determined in future research. The former is certainly possible in view of the importance which the position power dimension occupies in the experiment and in view of the relatively small difference between structured and unstructured tasks. That the general hypothesis was supported despite differences in language and population samples, and that it could be extended to heterocultural groups, testifies to the robustness of the theory. Further attempts to generalize the model are now underway.

The model takes on additional significance in view of the fact that we did not find significant differences in leadership performance due to leadership training or experience, or to group heterogeneity. Neither leadership experience nor orthodox leadership training as currently administered, is likely to increase the individual's ability to fit his leadership style to the requirements of the group-task situation. Nor is current training designed to assist the leader in modifying the situation so that he will be able to cope with it more effectively.

It is almost always easier to change environmental factors than to change an individual's personality or his style of interpersonal relations. The most eligible solution for increasing leadership effectiveness seems to lie, therefore, in "engineering the group task situation" so that it will fit the leader's style. This has already been suggested in a recent paper (Fiedler, 1964), and the present data provide further support for this view.

What, then, are the implications of these results for training? As has been demonstrated in this study, we can change the group-task situation in a number of ways. We can modify (a) group homogeneity, (b) leader position power, (c) task structure, (d) the sequencing of tasks and the concomitant learning effects, and (e) the time a group has to work together and to learn how to operate as a team. Our study showed that the groups performed about as well in unfavorable as in favorable group-task situations. It is, apparently, more important that the leader's style fit the group-task situation than that it be favorable for the leader. The Contingency Model therefore, presents one possible alternative to current practices of leadership training and placement.

Summary and Conclusions

An experiment was conducted in cooperation with the Belgian Naval Forces at the Naval Training Center at Ste. Croix-Bruges. The study was designed to compare the performance of homocultural and heterocultural three-man teams on three different types of tasks. 144 Flemish and 144 Walloon or French-speaking petty officers and recruits were assigned to 96 three-man teams balanced for homogeneity, intelligence and LPC scores of members and leaders, order of task presentation, and attitudes toward the other group. The tasks consisted of writing a recruiting letter, the two unstructured tasks required finding the shortest route for ships traveling through a given number of ports. A completely non-verbal task entailed training "foreign" men in the assembly and disassembly of hand weapons.

Results of the study showed that homocultural groups performed better than heterocultural groups on the unstructured letter writing task. However, heterocultural groups performed about as well as homocultural groups on the non-verbal and the two structured tasks. Thus, neither the handicap caused by poor ability to communicate, nor the cultural divergencies between Flemings and Walloons, materially reduced the performance of heterocultural teams. Even more important in their potential implications for current leadership training theory and method were the results showing that groups led by trained and experienced petty officers with strong position power performed no better on any of the tasks than did weak, untrained, inexperienced recruit leaders. These findings raise serious questions about the value which current leadership training and experience have for increasing team performance.

The experiment tested the hypothesis derived from the Contingency Model of leadership effectiveness. This model holds that very favorable, as well as moderately unfavorable situations require low LPC leaders, while group situations intermediate in favorableness require the more considerate, high LPC leaders. This hypothesis was here supported and extended to heterocultural teams, indicating that heterocultural groups generally tend to require low LPC leaders for effective performance.

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| <p>An experiment was conducted (a) to compare the performance of 96 culturally and linguistically homogeneous and heterogeneous three-man teams under powerful and weak leadership positions and on three types of tasks varying in structure and requirements for verbal interaction, and (b) to test a previously described Contingency Model of Leadership Effectiveness.</p> <p>The experiment, conducted in collaboration with the Belgian Naval Forces, utilized 288 petty officers and men from a naval training center, who were assigned to 96 groups in a 16-cell design.</p> <p>Homocultural and heterocultural groups differed in performance only on the highly verbal task. Heterogeneous groups, despite obvious communication difficulties and culturally divergent background, performed about as well on the structured and non-verbal tasks as did homogeneous groups. Groups led by recruit leaders performed as well as groups directed by petty officers. Thus, neither the military leadership training and experience nor the position power of petty officers contributed to the effectiveness of these groups. These findings have considerable potential implications for leadership training programs and an evaluation of the communication variable in affecting group productivity.</p> <p>The experiment clearly supported the hypothesis derived from the Contingency Model that the specific leadership style required for effective group performance is contingent upon the favorableness of the group-task situation. As in previous research, groups under managing, task-controlling (low LPC) leaders performed best in very favorable group-task situations as well as in group-task situations</p> | | | |

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13. Abstract (continued)

which were relatively unfavorable or very unfavorable. Permissive, considerate, group-oriented leaders performed best in situations intermediate in favorableness.

| 14. KEY WORDS | LINK A | | LINK B | | LINK C | |
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