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The Effect of Leadership and Cultural Heterogeneity on Group Performance: A Test of the Contingency Model

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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. Homocultural and heterocultural groups differed in performance only on the highly verbal task. Heterogeneous groups, despite obvious communication difficulties and culturally divergent backgrounds, performed about as well on the structured and nonverbal 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 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

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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.

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 include, to mention but a few, 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 differences in race and socioeconomic status among members.

This study had two major purposes. First, it tested whether 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, with 240 recruits and 48 petty officers. Half of these petty officers and recruits were from French-speaking homes, the other half from Dutch-speaking homes. At the time of the study the recruits, ranging in age from 17 to 24 (mean age of 20.17), were expected to serve in the Belgian Navy for a term of 12 months after which most of them would return to civilian life. Petty officers are career men who plan to remain in service for 20 years or more. They typically complete 2 years of petty officer candidate school, which they enter directly after high school or an equivalent technical 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 a high status roughly comparable to that of the U.S. Navy's

chief petty officer. The 48 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 10 years of leadership experience as petty officers in the Navy.

Belgium is sharply divided into two population and geographical sectors. Roughly 55% of the population is Flemish and lives in the northern half of Belgium, with Dutch as the official language. The remaining 45% of the population consists of French-speaking Walloons who live in the southern part of the country. Brussels is primarily French-speaking, although officially bilingual. Only the minority of Belgians speaks both languages well, and relatively few from French-speaking homes are fluent in Dutch.

Since achieving 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. Officers and petty officers are expected to give orders, training, and instructions in the men's mother tongue, and bilingual units are avoided wherever possible.

Pretests

All available petty officers and men ($N = 546$) at the Naval Training Center were given a series of pretests 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) *Description of least preferred co-workers (LPC).* These scores constituted the major predictors of this study and have been extensively described in other papers (Fiedler, 1962, 1964; Bass and Fiedler, 1962). LPC scores were obtained by asking the men to think of all the co-workers they had ever had and to describe the one individual with whom they could work least well. Thus, the least preferred co-worker 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 *et al.,* 1957), and contained 20 items (in Dutch or French) such as the following:

Pleasant :—8—:—7—:—6—:—5—:—4—:—3—:—2—:—1—: Unpleasant
Friendly :—8—:—7—:—6—:—5—:—4—:—3—:—2—:—1—: Unfriendly[2]

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.

The LPC score is best interpreted as a dynamic trait which results in different specific behaviors as the situation changes. The individual who perceives his least preferred co-worker in a relatively favorable manner (high LPC) gains satisfaction and self-esteem from successful interpersonal relations. The person who perceives his least preferred co-worker in a very unfavorable manner (low LPC) gains satis-

[2] Other items on this scale were: 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.

faction and self-esteem from successful task performance. High and low LPC leaders thus seek to satisfy different needs in the group situation.

This formulation emerges from a number of studies which are giving convergent results. High LPC leaders are generally described as more considerate of the feelings of group members, less punitive, and more relationship- than task-oriented in their behaviors than are low LPC leaders (Meuwese and Fiedler, 1965; Fiedler, Meuwese, and Oonk, 1961; Morris and Fiedler, 1964). The important clues for the interpretation of the score are to be found, however, in the differences in behavior of high and low LPC persons when they are in anxiety-producing or "difficult" situations as against tension-free, "easy," and nonthreatening situations (Fiedler, 1962).

For example, low LPC persons experienced negotiation groups as considerably and significantly more pleasant when they felt that their side had been successful than when they felt their side had been unsuccessful. In contrast, perceived success did not correlate with perceived pleasantness for high LPC leaders (McGrath and Julian, 1962). In a reanalysis of the rifle teams study by Bishop, low LPC men felt more accepted by their group when they were successful on the task than when their group was unsuccessful, while success again did not influence the feeling of acceptance of high LPC group members. A study by Bishop (1964) showed that group members with high LPC scores improved in adjustment and self-esteem scores if they felt they had been successful in their interpersonal relations (that is, if they felt accepted by the group), but not necessarily if they had been successful on the task. Exactly the reverse was the case for low LPC members, who improved in adjustment and self-esteem scores if they felt successful on the task but not necessarily if they felt successful in their interpersonal relations. Data from the present study, to be reported in a subsequent paper, provide further evidence for this interpretation.

(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, 1960) was administered 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. Those 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.

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

TABLE 1
DESIGN OF THE EXPERIMENT[a]

	High position power		Low position power	
	Task sequence		Task sequence	
Leader's language	UT–ST–NVT	ST–UT–NVT	UT–ST–NVT	ST–UT–NVT
Homogeneous				
Dutch	D[b]	H	N	R
French	E	K	O	S
Heterogeneous				
Dutch	F	L	P	T
French	G	M	Q	U

[a] UT = unstructured task; ST = structured task; NVT = nonverbal task.
[b] Letters D through U identify cells in this study.

eight the 48 heterogeneous groups, eight had Flemish and eight French-speaking leaders, eight contained groups with high position power and eight groups with low position power. Three types of tasks (described below) 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 half the groups started to work with a structured task while the other half began with the unstructured task (a nonverbal, co-acting task was given last). All 96 groups were run on the same day to prevent communication among the men about tasks or procedures. Table 1 presents the experimental design.

The six groups within each cell were further subdivided so that three groups

TABLE 2
LPC AND INTELLIGENCE DISTRIBUTION OF GROUPS WITHIN EACH CELL

Intelligence of group	LPC of leader and group members		
	High	Medium	Low
High	One group	One group	One group
Low	One group	One group	One group

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 (Table 2). The cell means on intelligence, LPC, and attitude scores were nearly equal. The men in the heterogeneous groups necessarily had higher scores in comprehension of the second language.

Group Tasks

As mentioned, three types of group tasks were used which varied in task structure and in verbal interaction requirements. 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. The unstructured task demanded a creative product. The men were told that their committee was to devise a recruiting letter for boys of 16 to 17 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 5 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 on style and form as well as on 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. This was considered unwise by the officers of the Naval Training Center, since they felt that the men would resist working on a completely unstructured task which did not seem related to the military service. For this reason, this task was somewhat more structured than would otherwise be 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 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.

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 worth-

while one. If the letter makes one 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 one completely unconvinced or unwilling to join, especially if one would 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 respectively over eight French-speaking and seven Dutch-speaking judges and converted to T scores. The reliability of this criterion, based on inter-rater agreement, was estimated to be .86 for the French-speaking and .92 for the Dutch-speaking judges (Cronbach, Gleser, and Rajaratnam, 1963).

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 20 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 be added to increase the reliability of this criterion. However, 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, and 62 of the 96 groups made a total of 189 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 68 errors on the second structured task. The second task would therefore seem to be a methodologically better measure of group performance.

Each of three independent raters[3] 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 nearest refueling port to the ship and back, so that a fuel tanker could go out to refuel the ship. The third method added a penalty which approximated somewhat more than the average mileage that the ship would have gained by its errors. Despite the fact that the three ratings were based on different theories for assessing 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. As in the

[3] We are indebted to Paul Ninane and H. Noel for their assistance. The author was the third rater.

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 nonverbal task. This task was designed to be a completely silent "co-acting" task situation, 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 presumably did not speak their language. The leader's job was to train his men in field stripping and assembling the hand weapon in a 10-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. Because the correlation between the two members' scores was fairly low (.35), the data could be used only in some of the cruder analyses.

Task intercorrelations. The median intercorrelation among the four performance scores was only .14, with a range of .03 to .20. The tasks were, therefore, independent. This seems somewhat surprising, especially in the case of the two structured tasks which are essentially identical and which correlated only .14. These findings are, however, quite consistent with the hypothesis of the Contingency Model which is described later.[4]

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.

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.[5] The internal consistency of the scale was over .90. 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.[6]

[4] On 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.

[5] The remaining items were: satisfying-frustrating; enthusiastic-unenthusiastic; productive-nonproductive; cooperative-uncooperative; supportive-hostile; interesting-boring; successful-unsuccessful.

[6] Group 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

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, and task-oriented actions, as well as person-oriented behavior labeled 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 with his group. 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 leaders and fellow group members.

A factor analysis of the post-meeting scales and questionnaires given after the structured and unstructured task resulted in leader 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 in Table 3 along with corresponding factor loadings. The group

TABLE 3

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	.80	.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.

climate factor scores 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 *post hoc* 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.

RESULTS

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,

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.

TABLE 4
MEAN TASK PERFORMANCE IN STANDARD SCORES FOR GROUPS UNDER MAIN EXPERIMENTAL CONDITIONS

Group composition	Task	Position power: High	Position power: Low
Homogeneous	Unstructured	53.10	51.55
	Structured I	53.20	47.32
	Structured II	50.25	49.24
	Nonverbal	51.48	47.89
Heterogeneous	Unstructured	48.52	46.87
	Structured I	46.48	52.05
	Structured II	48.70	51.43
	Nonverbal	50.04	50.60

with those in which members and leaders differ in language and background. This study also compared teams in which recruits worked under the leadership of trained and experienced petty officers with those in which recruits worked under fellow recruits. The working hypothesis was that homogeneous groups and those led by petty officers would be

TABLE 5
ANALYSIS OF SIGNIFICANT VARIANCE RESULTS FOR PERFORMANCE SCORES

	Mean performance scores		F Ratio	P	% Variance
Structured Task I	52.85		10.333	.01	7.2
	47.12				
	Homogeneous	Heterogeneous			
High position power	53.21	46.50			
Low position power	47.33	52.19	11.890	.01	8.4
Structured Task II					
High IQ	52.40				
Low IQ	47.56		4.480	.05	4.5
Unstructured Task					
Homogeneous	52.35				
Heterogeneous		47.71	6.394	.05	4.5
High IQ	54.00				
Low IQ	46.06		18.665	.01	14.8
Nonverbal Task					
High IQ	9.75				
Low IQ	7.38		6.485	.05	5.3
	High IQ	Low IQ			
High position power	8.92	9.00			
Low position power	10.58	5.75	6.948	.05	5.8

superior in performance to heterogeneous groups and to groups having recruit leaders.

Analyses of variance, one per task, were computed to compare 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 4 presents the results (in T scores) obtained in the four main conditions. The significant analyses of variance results are summarized in Table 5. The results are shown on Fig. 1.

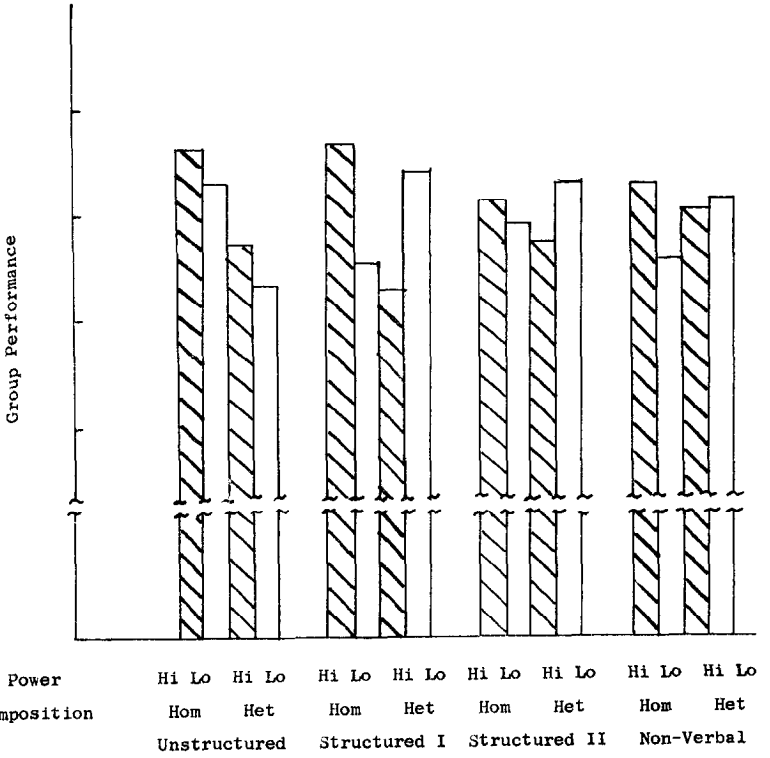

FIG. 1. Performance of homogeneous and heterogeneous groups with high and low position power.

The differences in the performances 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 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 nonverbal task where similar results were not found. This suggests a communication difficulty in the group process that was amenable to learning or practice rather than one caused by deep-seated resentments and antagonistic attitudes.

3. An interaction was also found on the nonverbal task (which required the leader to instruct his men in disassembling and reassembling 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 dull recruit leaders, on the other hand, undoubtedly had more difficulty in learning the assembly and disassembly procedures, and they may also have experienced more difficulty in teaching these procedures to their equally dull team members.

The results of this study 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 equally 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 applies to "interacting" groups, that is, groups in which the members must work together cooperatively, or in which the task cannot be performed by one person alone. It states that the leadership style required for effective performance of these 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, nondirective style of the high LPC leader. The present study tests the Contingency Model and extends the research to heterocultural groups. The nonverbal 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 nondirective, 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. By the *favorableness of the group situation* is here meant the ease with which the leader is able to influence the group members, that is, the degree to which the group task and group

organization facilitates or inhibits the leader's ability to exert influence without incurring resistance.

Our previous research has used the Esteem for the Least Preferred Co-worker (LPC) and the Assumed Similarity between Opposites (ASo) score, which are highly correlated (.80 to .90). As already discussed they indicate the degree to which the leader seeks satisfaction from successful interpersonal relations or from successful task performance. 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. These 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 recent study by Fishbein *et al.* (1965) shows that approximately one-half the variance is accounted for by this dimension. This dimension seems to represent the most important aspect of the leader-member relationship. 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. 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 (French, 1956) indicates position power. 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, ir-

respective of his ability or willingness to use it. This dimension can be reliably measured by means of a simple checklist (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 (Fig. 2). Thus, Cell I includes group-task situations in which the

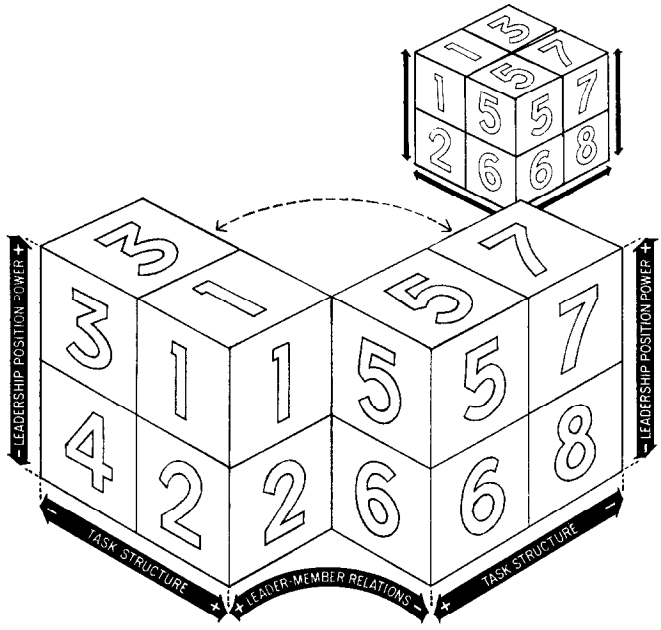

FIG. 2. A model for the classification of group-task situations.*

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 rela-

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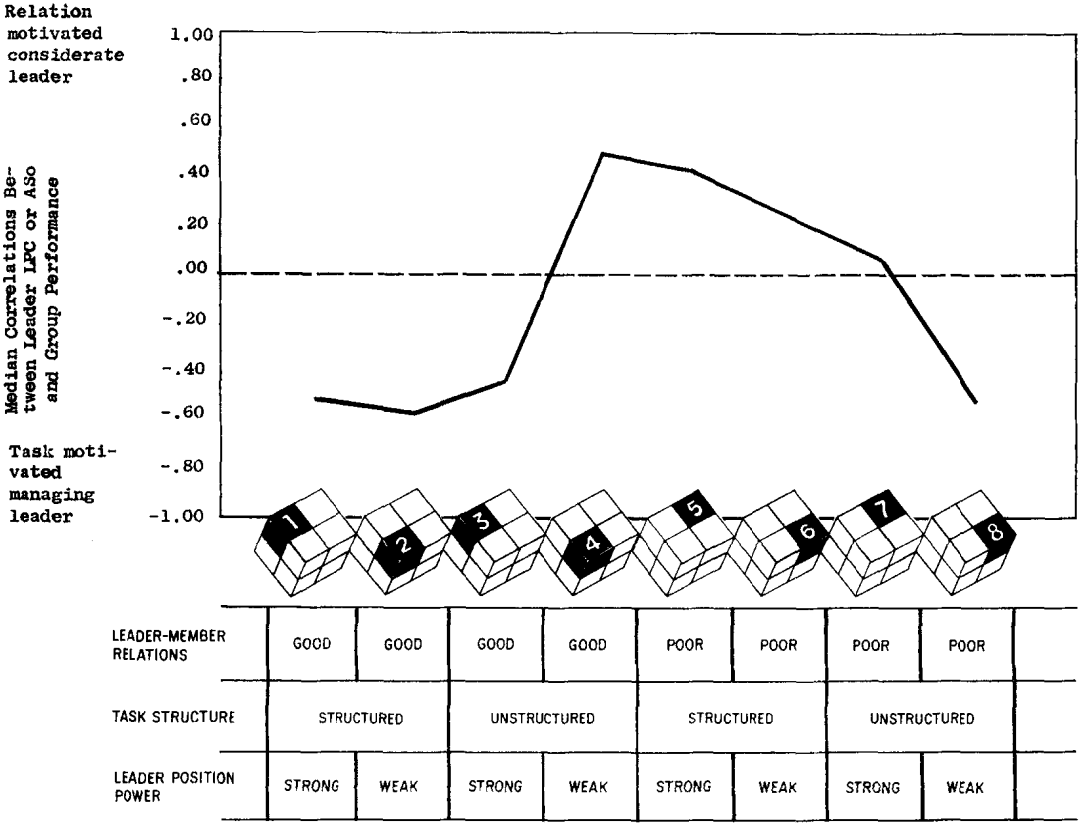

FIG. 3. Correlations between leaders' LPC scores and group effectiveness plotted for each cell.†

† This figure is reproduced by permission from The Harvard Business Review, September–October, 1965, p. 118.

tions, 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 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 Fig. 3. 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 VII. In other words, low LPC leaders tended to perform best in very favorable and in very unfavorable group-task situations; the 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 in this experiment 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 that measured affective leader-member relations. A further division was required on the basis of homogeneity versus heterogeneity.

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" tasks the leader had already learned to some extent how to work with his men); and, 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 covariance 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 (three correlations for each of the 16 cells) constitute the basic data for testing the Contingency Hypothesis.

These data are presented in Table 6. 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 unstructured 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 (by using the unstructured

TABLE 6
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	Split on leader group climate			Weights indicating favorableness of the group—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	8
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	8
				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	8
				Low	08	09	−19	4	4	5
PQ	Het.	Low	U	High	−89	−49	77	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

[a] UT = unstructured task; STI = first structured task; STII = second structured task. PP = position power. U = task presentation sequence beginning with the unstructured task. S = task presentation beginning with the structured task.

[b] See Table 1 for Cell designation.

[c] N's = 5.

and second structured task), and position power of the leader, in addition to the main variable of homogeneity versus heterogeneity.

Figure 4 shows the performance curve based upon these data, abstracted for this purpose from Table 6. The curve is drawn through the medians of the correlations representing each cell.

As in Fig. 2, which shows 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.

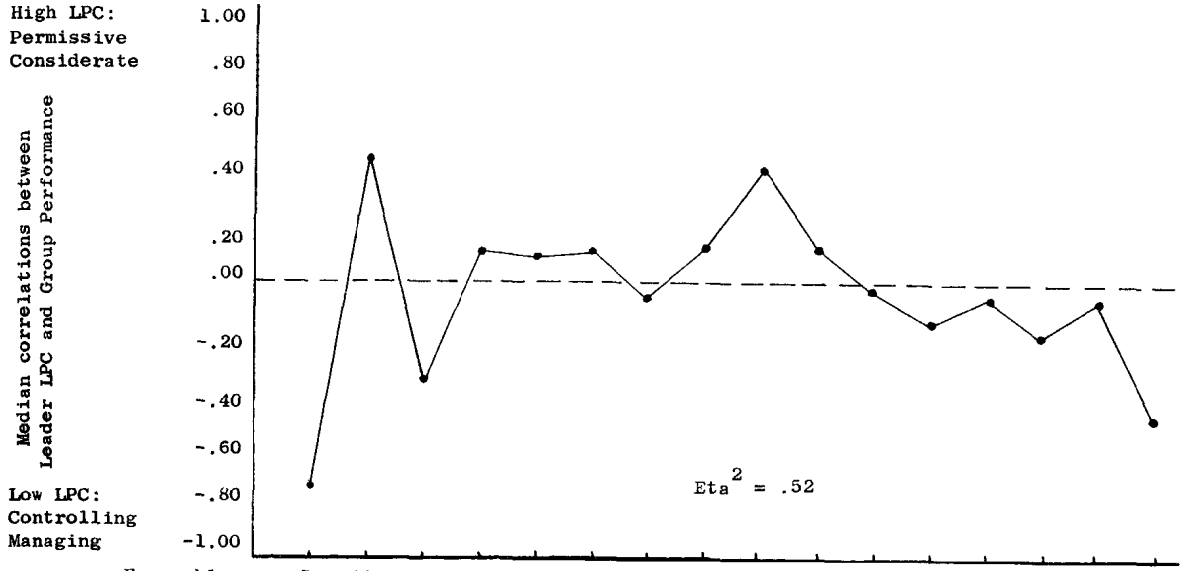

FIG. 4. Correlations between leader LPC scores and group performance for homogeneous and heterogeneous groups, following the original classification of group-task situations presented in Fiedler (1964).

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 clearly much greater in the Belgian military teams than in civilian groups or even in the 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 experiment 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 struc-

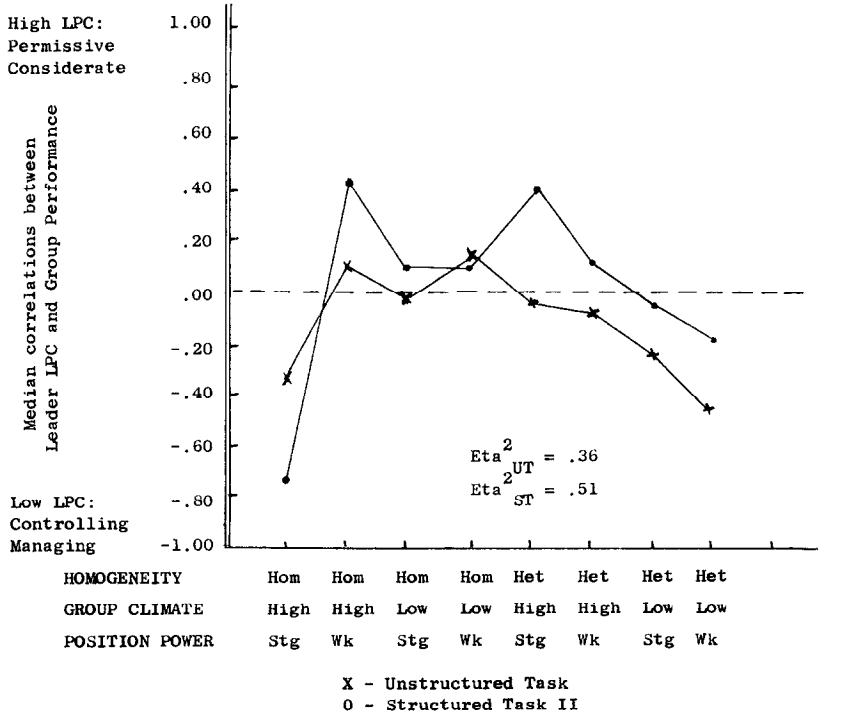

FIG. 5. Correlations between leader LPC and group performance in unstructured and second structured tasks, classified by homogeneity, group climate, and position power of teams.

tured tasks are plotted in Fig. 5, and clearly indicate the curvilinearity of the relations.

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 co-workers and the writer after the groups had been run, but prior to the analysis of all the data. This test of the Contingency Model was specifically tailored to the particular conditions which the experiment incorporated. While this enabled

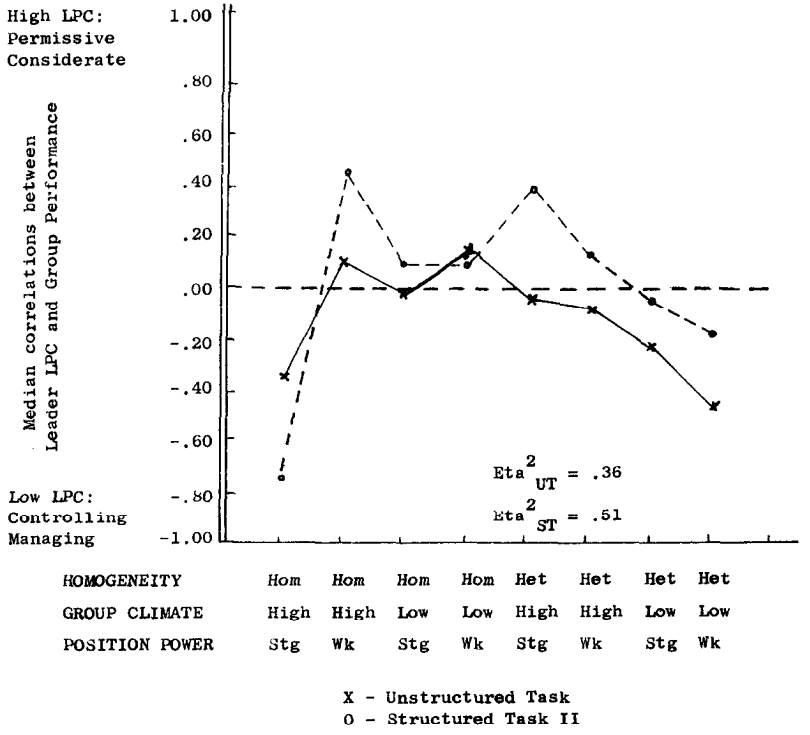

FIG. 6. Performance curve indicating the relationship of leader LPC and performance with task-group situation difficulty for all tasks, split on leader group climate factor.

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 benefited 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 6, for each of the three tasks.[7] The performance curve in Fig. 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 considerate, relation-oriented, high LPC leaders performed best in situations of intermediate favorableness. Heterocultural groups tended to fare better under low LPC leaders.

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, accurately reflects the opinion of writers in the field when he says:

> Communication lies at the heart of the group interaction process. No group, whether an informal or formal organization . . . can function effectively unless its members can communicate with facility. . . . The free flow of information

[7] 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; good group climate, 3. 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.

> 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. 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 many men may have had unfavorable 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.

While heterogeneous groups had less pleasant group atmosphere and higher anxiety scores, these 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 re-evaluating the importance of the communication variable in group interaction.

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 have been given leadership training and those which have not. The majority of studies in this area evaluate the effectiveness of leadership *behavior,* rather than the effectiveness of group performance (Barnlund, 1955; Harris and Fleishman, 1955).

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 2 years of leadership and technical training in petty officer candidate school, which is comparable in quality and intensity to similar training in the United States. He also had about 10 years of leadership experience behind him. This contrasts 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. Moreover, the correlation between the number of years a man served as petty officer and his group's performance was small and not significant.

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 nonverbal, 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. These tasks were also considered fair by the commandant of the Center and by officers of his staff, who, in fact, helped to design 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 not 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 gen-

erality of our findings. For what it is worth, we may note that the petty officers' performances did not improve proportionatly 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 question whether extensive training and experience of the leader, at least in *ad hoc* groups, contributes 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 seems likely in view of the strong position power of Navy petty officers *vis-à-vis* recruits in the Belgian military system, 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.

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