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LEADERSHIP AND GROUP CREATIVITY UNDER VARYING CONDITIONS OF STRESS

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Group and Organizational Factors Influencing Creativity
Office of Naval Research Contract NR 177-472, Nonr-1834(36)

FRED E. FIEDLER, CHARLES E. OSGOOD,
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Leadership and Group Creativity Under
Varying Conditions of Stress

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Technische Hogeschool
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A B S T R A C T

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This experiment investigated the influence of the leader's ability and interpersonal attitudes toward co-workers on the creative performance of discussion groups on two tasks and under three conditions of stress. Interpersonal attitudes were measured by means of the leader's esteem for his least-preferred co-worker (LPC) which had yielded consistent relations with group performance in previous studies.

Fifty-four three-man groups, composed of senior cadets of the Army and Navy Reserve Officers Training Corps program participated. Nine groups in each condition had high and nine had low LPC leaders. Internal stress was induced by the task which engendered divisive attitudes in groups in which Army and Navy cadets were to work together; external stress was induced by having senior Army Field officers closely watch and rate the groups of Army cadets while they were working; the control condition attempted to minimize stress by de-emphasizing the military aspects of the problems and by assuring the men that their performance would not affect their records.

On the first task the more directive, managing, low LPC leaders had better performing groups in the control condition; the more non-directive, permissive, human relations-oriented (high LPC) leaders had better performing groups in the internal stress condition. No differences were found in the external stress condition. On the second task, low LPC leaders performed better in all conditions.

Leader intelligence correlated positively with group performance in the control and internal stress condition, but not in the external stress condition.

Leadership and Group Creativity Under Varying Conditions of Stress*

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I. Background and Problem

This study investigates some determinants of group creativity and group process under varying conditions of stress. Specifically, it investigates the effects of two individual variables on group performance: intelligence of the group leader and the leader's attitude toward his least-preferred coworker. These relations are studied under four different conditions of stress: relatively low stress, stress internal to the group (or interpersonal strain), pressure from the immediate social environment of the group, and stress arising from an internally divisive task.

The current interest in team performance reflects the increasing importance of decision-making groups in modern society. More and more reliance is placed upon small groups for planning and decision-making functions, as well as for creative work. Problems in such fields as electronics, space technology, international politics, and even psychological research have grown so complex that few individuals are capable of coping

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singlehandedly with them. This increased complexity has resulted in an increased reliance on group decision-making in the belief that several people together are better able than one individual alone to solve complex problems, a view for which there is some empirical support (Shaw, 1932; Taylor, 1954).

A sizeable amount of research information exists concerning the effects of various independent variables on group process and, to a lesser extent, concerning the effectiveness of planning and problem-solving groups. However, the results of the research have not been readily generalizable to types of groups other than those used in a particular study.

Group size and composition. Relatively little empirical research concerning group creativity is available. Studies of the effect of size on group efficiency seem to favor small groups over larger ones. Large conference groups are more disruptive than smaller ones (Miller, 1950); small discussion groups reach consensus easier than do large groups (Hare, 1952); members in small groups are more satisfied (Slater, 1953). Larger groups, however, initiate more new ideas (Gibb, 1951) and make fewer errors (Taylor and Faust, 1952).

Heterogeneity of certain personality attributes of group members seems to be conducive to effectiveness on a problem-solving task (Hoffman, 1959). Cattell, Saunders, and Stice (1953) found that accuracy of group judgment in decision-making is positively correlated with heterogeneity on some traits (e.g., surgency and radicalism), but negatively correlated with heterogeneity on other traits (e.g., suspiciousness and aggressiveness). A study by Schutz (1955) suggests that groups composed of members compatible in terms of interpersonal needs are more effective than groups composed of incompatible members. However, this effect exists only when the task is relatively complex.

Effects of various communication networks on group performance have been more fully investigated (e.g., Bavelas, 1950; Guetzkow, 1953; Miller, 1943; Shaw, Rothschild, and Strickland, 1957; and Glanzer and Glaser, 1961). Generally, on simple problem-solving tasks a more centralized communication network, according to Mulder (1960), the centrality of the decision structure is more effective than a non-central one.

Leadership effectiveness. Another area of interest concerns the effect of various leadership styles on group performance. Research on traits characteristic of effective leaders has been extremely discouraging (Gibb, 1954; Stogdill, 1943). Some correlates of leadership effectiveness have been found, but the relationships tend to be very weak and inconsistent from one study to another. Investigations of the direct relationship between leadership style and group effectiveness are limited in number, and they are inconclusive (Gibb, 1954; Kelley and Thibaut, 1954). Maier and Solem (1952) found that active discussion leaders have more effective groups than do observing, non-participating leaders on a problem-solving task. Leaders participating actively in development of the problem-solving process have better groups than do leaders who stimulate discussion but do not participate in the solution of the problem (Maier and Maier, 1957). No difference was found between leaders who stimulate groups positively (by increasing understanding and actions that tend to unify the group) and leaders who stimulate groups negatively (Heyns and Miller, 1949). Non-punitive supervision is better than punitive supervision (Argyle, et al., 1957). "Democratic" leadership has been found to be better than "authoritarian" leadership (McCurdy and Eber, 1953); however, Spector and Suttell (1956) found no difference between the latter two types. Finally, in groups working on creative tasks (Anderson and Fiedler, 1962) participatory leadership was found to be related to quantity of production, and supervisory leadership to quality of production.

In many of these studies it is not entirely clear how the experimental manipulations were instituted. Hence, no inference can be made about the basic leadership variables determining group performance in these studies. This fact is even more true for studies in which leadership training programs are evaluated (e.g., Maier, 1953; Barnlund, 1955).

Individual attributes and group performance. Any reasonably complete theory of group performance must take into account the influence of individual differences in task-relevant variables on group performance and process. Few studies on the relationships between personality traits of the members and group effectiveness have been reported. Haythorn (1953) found that cooperativeness, efficiency, and insight of members are positively related to group efficiency; however, such individualistic traits as aggressiveness and authoritarianism tend to depress group functioning.

The program of studies by Fiedler and his associates (1953, 1962, 1963) has found some consistent relationship between the leader's attitude toward his coworkers and group performance for a large variety of groups. Recently, intelligence and task-relevant abilities of leaders and members have been integrated into this pattern of relationships (Fiedler and Meuwese, 1963; Fiedler, 1963). This research program will be reviewed in the next section.

Relationships Between Leader Attitudes, Intelligence, and Group Performance

Leader attitudes and group performance. Work directed by Fiedler has identified consistent relationships between certain leader attitude scores and the level of performance of the group. These leader attitudes were measured on adjective scales modeled after Osgood's (1957) semantic differential:

Friendly: 0 : 7 : 6 : 5 : 4 : 3 : 2 : 1 : Unfriendly
Warm : 0 : 7 : 6 : 5 : 4 : 3 : 2 : 1 : Cold

Judgments on these scales are usually obtained before the groups are assembled. The leaders are asked to describe the least- and the most-preferred coworker whom they have ever had. Typically, these most- and least-preferred coworkers are not members of the leader's present group, but individuals with whom he has worked in the past.

Two scores are generally derived from these scales: the "Assumed Similarity between Opposites" score (ASo), which is a profile difference (D) score between descriptions of the least- and the most-preferred coworkers (Cronbach and Glaser, 1953); and the "Esteem for the Least-Preferred Coworker" score (LPC), which consists of a summation of the scale scores for the description of the least-preferred coworker, with all scales scored in the positive (favorable) direction. These two scores correlate between .75 and .90.

ASo correlated negatively with group effectiveness in a series of studies utilizing basketball teams, open-hearth steel shops, land surveying parties, anti-aircraft artillery crews, and farm cooperatives. However, this negative relation held only for groups in which the leader was sociometrically endorsed by the group.

ASo and LPC scores were originally interpreted as indicating the psychological distance that the leader maintains between himself and his coworkers. A leader who has a low ASo or LPC score was seen as maintaining a high psychological distance and to be task-oriented, cold, and not particularly interested in interpersonal relations in a group.

At the opposite pole, a leader who has a high ASo or LPC score was seen as keeping little psychological distance between himself and his group members, to be oriented mainly toward maintaining good interpersonal relations, and to have a warm and psychologically close attitude toward others.

These relationships raised the question of the behavior associated with the leader's ASo score and the highly correlated LPC score. In an attempt to answer this question, content analyses were performed on the tape recordings of group sessions in two studies (Meuwese and Oonk, 1960; Fiedler, London, and Nemo, 1961). The first study utilized a five-category classification system; the second study used the Bales (1950) system.

These analyses suggested that high LPC leaders tend to show tension-free, non-directive behavior oriented toward maintenance of good interpersonal relations, whereas low LPC leaders show more controlling, directive, forceful behavior, oriented toward management of the task procedure. Although these conclusions are highly tentative, they essentially are in line with the earlier interpretations of the LPC score.

Research of relationships with other individual test scores (e.g., personality tests) has been extremely discouraging. LPC has been found to correlate with some other measures of perceptual discrimination, but not with any of the standard personality tests, such as Cattell's 16 PF and Guilford's Personality Inventory (Golb and Fiedler, 1955). A correlational study involving a large array of ability, personality, and interpersonal perception measures (Bass, Fiedler, and Krueger, 1964) revealed few if any meaningful differences between high and low ASo or LPC individuals in either biographical, ability, or personality scores. Therefore, it seems that the ASo or LPC score is unique in individual measurement and relevant in a group context only.

Studies of discussion groups performing intellectual tasks showed the need for introduction of a moderator variable into the system. In the Netherlands a study was conducted utilizing four-man groups, homogeneous and heterogeneous in socio-cultural background (Calvinists and Catholics), with and without formal leaders (Fiedler, Meuwese, and Oonk, 1961).

The groups worked on a creative task that involved the writing of three stories on the basis of a TAT card. Two independent judges reliably assessed the creativity of the stories.

This study demonstrated that the negative relationships between the psychological distance of the leader and group performance holds only if the group is under some interpersonal stress. If the group is relaxed and relatively free of stress, the permissive, considerate high LPC leader has the most effective group. In the above study, heterogeneity of the group and the lack of formal leadership were interpreted as bases for the generation of interpersonal strain.

The relationships between LPC of the leader and group performance under varying conditions of stress were cross-validated in a study utilizing groups of three women; in this group the leader was a subject, and the other two members were confederates (Fiedler, London, and Nemo, 1961). The group task involved writing three stories about the same TAT card. Amount of stress was measured by means of "Group Atmosphere" (GA) scales. These scales consisted of a number of evaluative bipolar adjective scales (similar to those used to measure LPC), on which the subjects described the group's atmosphere as they perceived it. The set of groups was subdivided into those in which the leader perceived a favorable group atmosphere and those in which her GA scores were low. As hypothesized, the leader's LPC score correlated positively with task performance in the high GA groups and negatively in the low GA groups.

A second cross-validation was provided by a study utilizing church leaders and administrators assembled into four-person groups (Fiedler, Bass, and Fiedler, 1961). The teams worked on four different tasks: (a) writing a hypothetical justification of a minister's decision not to divulge that a local physician intended to commit a mercy killing; (b) writing a parable to illustrate the desirability of separating church and state; (c) developing

an appeal for funds; and (d) constructing a skit to illustrate the need for better music in the worship service. Perceived stress was again assessed by means of Group Atmosphere scales.

When groups were divided into those in which the leader perceived the group atmosphere to be relaxed and relatively stress-free and those in which the leader felt it to be tense, on all four tasks the LPC score of the leader correlated positively with group performance under high GA conditions and negatively under low GA conditions. However, it was found that the leader's, rather than the members', GA score divided the groups into subsets in which the hypothesized relations between LPC and performance most clearly emerged.

All these studies were conducted with artificial laboratory groups. In an attempt to cross-validate these findings on natural groups, data from a field study with boards of directors of 32 farm-supply cooperatives (Godfrey, Fiedler, and Hall, 1959) were reanalyzed. Conflicting or harmonious interpersonal relations were inferred from sociometric questionnaires. As hypothesized, the LPC score of the chairmen of the boards of directors correlated positively with net income of the company when interpersonal relations between board and management were harmonious, but negatively when the data indicated interpersonal conflict (Fiedler, 1962).

A study conducted in the context of a leadership-training program for a mental health association experimentally varied group stress. The leaders of fifteen three-man groups were chosen from the high and the low ends of the LPC distribution. Members were assigned at random to groups, which worked first under a "relaxed" condition, in which the session was presented as a warm-up exercise. The groups were assured that they would have sufficient time for an easy task. In a session immediately following, the groups were put under external pressure: the time was limited, a more difficult task was assigned, and the idea was communicated that this was

a true test of leadership ability. To increase the stress even more, the results of the first session were announced publicly before the second session was begun.

The tasks involved (a) writing a statement that justified the position that all elementary public schools be made available for approved mental health research by university students and (b) writing a fable or story for children illustrating the problems that a mental patient faces when he returns to the community after several years of hospitalization.

Neither of the two sessions yielded overall differences in performance between high and low LPC-led groups. However, under the "relaxed" condition, when the groups were divided into those in which the leader perceived a relaxed and pleasant group atmosphere and those in which he perceived tension, results showed the same relationships between LPC and performance as discussed above. No relation between LPC of the leader and group performance could be meaningfully computed in the "external pressure" condition, since GA and group performance were confounded, i.e., the leader's Group Atmosphere score correlated here .30 with group performance.

It will be recalled that in the studies discussed above the stress either was measured in terms of the leader's perceptions or it originated in experimentally induced sources of conflict within the group (e.g., heterogeneity). It is conceivable that we are here dealing with internal stress in all cases; that is, the existence, in the group, of interpersonal strain that resulted in a state of tension or loss of security for the leader. In the last study, however, external stress was induced. It seems possible that these different types of stress may have different consequences for the LPC-performance relationship.

A replication of the last study was undertaken with nineteen three-man groups consisting of church leaders and administrators in the context of a second leadership conference of the Unitarian-Universalist Church (Fiedler,

Hackman, and Meuwese, unpublished). Again, all groups first worked in a relaxed condition with an "easy task" for which they had sufficient time. The second session introduced external stress as in the previous experiment. The tasks were (a) to write a statement to be read by children, justifying the position that a short prayer at the start of each school day is objectionable¹; and (b) to write a statement about "What we (as Unitarians and Universalists) believe" in a form suitable for 8- to 10-year-old children of all faiths. These tasks were assumed to be roughly parallel to the tasks used in the former study.

This study supported the major hypothesis that (a) groups with high LPC leaders would perform better in the relaxed condition than would groups with low LPC leaders, and (b) there would be no differences between high and low LPC groups in the external stress condition.

In summary, the series of studies with discussion groups yielded consistent relations between leader attitudes toward coworkers (LPC), group performance on intellectual tasks, and stress in the group. When the group seemed relaxed and pleasant and the leader felt no interpersonal strain, high LPC leaders tended to have effective groups. When the group felt internal stress or the leader perceived interpersonal strain in it, low LPC leaders tended to have effective groups. Finally, when the group was forced to work under external pressure, no relation between LPC of the leader and group performance was found.

Intelligence and group performance. Although a relation between intelligence or ability of group members and the group's performance on

¹At the time of the experiment, there was controversy regarding the United States Supreme Court ruling that the practice of starting the school day with a prayer was unconstitutional because it violated the principle of separation of church and state.

creative tasks seems obvious, there is available surprisingly little systematic information bearing on this question.

McGrath (1962), reviewing a random sample of 200 small group studies, concluded that there was no consistent relation between these variables. However, Havron and McGrath (1961) showed that military squad effectiveness in their study was predictable from job knowledge of the leader and from his intelligence. Gibb (1954) found evidence of a positive correlation between intelligence and effectiveness of leadership. Mann (1959) and Guetzkow (1961), also mentioned this relation; they observed that intelligent individuals are somewhat more likely to assume leadership roles in initially leaderless groups. Triandis, et al., (1962) found that there was a general relation between individual creativity of the members and the creativity of dyads.

Generally, then, there is some evidence of a relation between intelligence or task-relevant abilities of the members of the group and group performance; however, conditions under which this relation becomes important have not been thoroughly investigated. A study by Fiedler and Meuwese (1963) provided information about one qualifying condition. In four different studies, no systematic overall relation was found between intelligence of the members and performance of the group. However, a substantial, positive relation between intelligence of the leader and group performance was demonstrated if the group was cohesive. A slight negative relation emerged for uncohesive groups.

A review by Mann (1959) provides information about the dynamics of the relation between intelligence and group performance. Groups with intelligent

members were found to have a higher activity rate. The more intelligent members also showed more positive social emotional behavior.

Summary. The series of studies here reviewed has shown that under certain specifiable conditions, group performance is predictable from the leader's intelligence and his attitude toward his coworkers. An attempt to integrate these findings leads to three basic assumptions:

1. Whenever a group characteristic (such as group effectiveness) co-varies with an individual characteristic, the individual who has this characteristic presumably exerts a direct influence on the group process. Thus, when a relationship exists between a leader attribute and group performance, it is assumed that the leader exerts power or influence over the group process.
2. The leader exercises his influence over the group process through the utilization of certain social techniques. His technique is defined as "appropriate" if it aids the group's performance.
3. Esteem for the Least-Preferred Coworker (LPC) and intelligence scores of the leader are predictors or correlates of differential social techniques for the exercise of influence.

Analysis of the relations between LPC scores and leader behavior suggests that high and low LPC leaders utilize different social techniques for the transmission of influence. The high LPC leader tends to be non-directive and oriented toward maintaining good interpersonal relations between the members of the group. This behavior is similar to the "Consideration" dimension of leader behavior found by Hemphill (Stogdill and Coons, 1957). This dimension is determined by warmth of interpersonal relationships, readiness to explain actions, and willingness to listen to subordinates.

The low LPC leader tends to show controlling, managing behavior oriented toward task performance. This behavior is similar to that on the "Initiation-of-Structure" dimension, which Hemphill also describes. This dimension is

determined by the extent to which the leader organizes and defines the relation between himself, his fellow group members, and the task.

As previous studies have shown, effective leader techniques depend upon environmental and group structural variables. It must first be recognized that no social technique can be effective unless the leader is able to exert influence. This means that the leader must have a basis for power (French, 1956). In informal groups a necessary and sufficient basis for power is the member's recognition and acceptance of the leader in his role (Fiedler, 1958).

On the basis of more recent studies, we would further deduce that the appropriateness of a social technique depends on the amount and kind of stress under which the group operates. When internal stress is present, strained interpersonal relations are likely to interfere with effective group performance, and the leader must see that the group performs its task; hence, initiation of structure is appropriate. When the group is tension-free, relaxed, and already task-motivated, initiation of structure is likely to interfere with the creative process although consideration will be conducive to good performance.

Obviously, stress is not the only variable intervening in the task process. The nature of the task itself is likely to affect these relationships. We assume that the relationships discussed above obtain only when the task is relatively neutral and not conducive to the rise of divergent, highly ego-involved attitudes on the part of the group members. Thus, an internally divisive, conflict-creating task, such as a negotiation problem, may create in the group a type of stress unresolvable by concentration on the task process. Therefore, with such a task, a greater amount of "consideration" behavior might be appropriate because of the need for reducing group tension.

This discussion can be summarized by means of the following schema illustrating the hypothesized relationships between LPC of the leader, task type, stress, and group effectiveness:

<u>Task type</u>	<u>Group Stress</u>	<u>Appropriate Technique</u>	<u>Effective Leader</u>
Conflict-generating	Originating in the task	Consideration	High LPC
Neutral	Originating in the group, independent of the task	Initiation of Structure	Low LPC
Neutral	Absent	Consideration	High LPC

Thus, "Initiation of Structure" is the appropriate leadership technique when the task is not inherently conflict-generating, but when interpersonal conflict is present for reasons independent of the specific task. A low LPC leader will be most effective in this type of situation, because he tends to use the "Initiation of Structure" technique.

The leader's intelligence is assumed to be related to the effectiveness of the social techniques discussed above. If intelligence is a task-relevant ability, a leader who depends on the "Initiation of Structure" technique (which is mainly task-oriented) will be aided in the effective utilization of this technique provided that he is intelligent. On the other hand, effective utilization of the "Consideration" technique does not require intelligence of the leader to the same extent. However, highly intelligent leaders are likely to become interested in contributing to the task, and they may do so at the cost of maintaining good interpersonal relations between members of the group and at the cost of enhancement of interpersonal security; they may do neither well enough for developing high group effectiveness.

Hypotheses

On the basis of preliminary findings as well as the above rationale, we hypothesized that high intelligence reinforces the utilization of the appropriate leadership technique for the low LPC leader, and relatively low intelligence reinforces the utilization of the appropriate technique for the high LPC leader. This proposition implies that LPC and intelligence of the leader interact in their effects on the group performance process. Four major hypotheses are here tested:

1. Relationships exist between leader attitude, group performance, and type of stress. The Esteem for the Least-Preferred Coworker (LPC) score of the leader will correlate with group performance on creative tasks:
 - a. positively in a condition relatively free of stress, in which the leader enjoys a pleasant and relaxed group atmosphere;
 - b. negatively in a situation in which interpersonal strain is present provided that this strain does not derive from properties of the task;
 - c. positively in a situation in which interpersonal strain derives from conflict-arousing properties of the task;
 - d. zero in a situation in which relatively great external pressure is brought to bear on the group.
2. Relationships between intelligence of the leader and group performance are hypothesized in line with the Fiedler and Meuwese (1963) study. Intelligence of the leader is positively correlated with group performance on creative tasks when the group is cohesive and free of stress.
3. Relationships between leader attitudes and leader behavior. Leaders with a low LPC score manifest behavior similar to that previously defined as "Initiation of Structure"; leaders with a high LPC score show behavior similar to that previously defined as "Consideration."
4. Interaction between intelligence and attitudes of the leader. Intelligence and LPC of the leader interact in their effects on measures of group process and interpersonal relations.

This last hypothesis is general in nature and provides a methodological orientation for the analyses rather than a precise prediction.

II. Method

Subjects and design. This study utilized 162 Army Reserve Officer Training Corps (ROTC) and Navy ROTC senior cadets at the University of Illinois. The men were assembled into three-man groups, and the resulting 54 groups were randomly assigned to three conditions. Eighteen groups consisted of two Army cadets and one Navy midshipman. The men were in uniform so that differences in reference group affiliation would be emphasized. The Army cadet with the lower cadet rank was appointed leader of the group. This constituted the Internal Stress Condition.

A second set of eighteen groups consisted of three Army cadets in uniform with the highest ranking man appointed as leader. So that there would be realistic tension and anxiety during the session, senior Army officers (Colonels, Lieutenant Colonels, and Majors)² closely observed and evaluated these groups. This constituted the External Stress Condition.

For a third set of eighteen groups, consisting of three Army cadets in street clothes, the experimenters attempted to create a tension-free atmosphere. Again the cadet with the highest rank was appointed leader. This provided a Control Condition.

In each of the three sets of groups, nine leaders were from the upper end of the distribution of LPC scores; the other nine were from the lower end. The members were randomly assigned to the groups. The design is summarized in Table 1.

Pretests. Prior to the group sessions, the subjects completed several tests and questionnaires.

- (a) a rating sheet of seventeen eight-point scales bounded by adjectives denoting personality traits, on which the subjects described their least-preferred coworker;

²We are indebted to Col. E. Sanford, Lt.Col. R. Burt, Lt.Col. D. Fane, Lt.Col. N. Grimm, Lt.Col. W. Hooper, Maj. J. Bushee, Maj. W. Fogel, and Maj. J. Hadley who served as observers.

Table 1

Schematic Representation of the Experimental Design

	<u>Control</u>	<u>Internal Stress</u>	<u>External Stress</u>
High LPC leader	9	9	9
Low LPC leader	9	9	9

- (b) a verbal intelligence test consisting of two subscales: a vocabulary and an information test;³
- (c) two tests of divergent, creative thinking designed by Guilford, et al. (1957), "Plot Titles", on which the subject had to write down as many original titles as he could think of for four given plots, and "Unusual Uses", requiring the subject to think of unusual uses for six common objects, e.g., an automobile tire;
- (d) a test for situational anxiety (Alexander and Husek, 1962).

Reliabilities of rating sheets and ability tests were all of satisfactory magnitude.

Instructions. Six groups were run concurrently in separate rooms. All were given the same standard instructions in all experimental conditions except that (a) in the Internal Stress Condition it was suggested to the men that friction might occur in the group; (b) in the External Stress Condition they were told that a senior officer would observe and judge them on cooperation and leadership; and (c) in the Control Condition they were assured that their performance would not be entered on their records.

Each group worked on two tasks. The first task was specifically designed to generate, in the Internal Stress Condition, task stress resulting from the anticipated difference in attitude between Army and Navy cadets.

Task I (the "Proposal" task) stated:

" The BOLTE Commission⁴ recently proposed to Congress that the ROTC program benefits be standardized. Specifically, the present system of financing the NROTC programs provides for tuition, books, and a \$50 monthly allowance for four years, whereas Army and Air Force ROTC cadets do not receive comparable benefits, especially during the first two years. According to the commission's report, this policy has attracted many exceptionally capable individuals into the Navy program purely for the financial benefits that it offers, although only 25 percent of these men remain in the service.

³From the Multi-Aptitude Test, Form B (1955), reproduced with permission from the Psychological Corporation, New York, New York.

⁴A commission with an essentially similar task actually existed at the time of the experiment.

"Your committee has been appointed to write a brief proposal to be submitted to the Joint Chiefs of Staff. This proposal should recommend a fair and equitable implementation of this policy, not to exceed the total of currently available funds for ROTC training; the recommendation should be justified as convincingly as possible.

"You will have 25 minutes in which to complete your proposal."

The second task was a group creativity task that would not normally arouse interpersonal conflict. This second task (the "Fable" task) stated:

"A nation-wide program has been instituted to alert the public to our defense problems. The ROTC has been assigned the task of helping elementary school children understand our current national defense problems. Your committee has been instructed to compose, for children from eight to ten years old, a fable or a story that clearly shows the need for a large army in peacetime. The fable or story must be clear to the young children, and it should be as interesting and original as possible. Your main point should be that a trained land army is the most important element of protection even when a country is not engaged in a major war but still must protect its coastline.

"Write down the complete fable or story, including an appropriate title. Remember that the story will be read by elementary school children. You will have 25 minutes in which to complete your story."

After completing the first task the groups in Control and Internal Stress Conditions were told in an informal manner that they had done quite well. Groups in the External Stress Condition were told that because their performance had been quite poor they would need to improve. Post-session interviews indicated that these comments generally were accepted at face value.

Performance criteria. The Proposal Task was rated by three judges, and the Fable Task by five judges. These ratings were based on various aspects of the task. Also, in order to obtain a measure of output, the number of words in each product was counted. Six performance scores were derived and intercorrelated. On the basis of the intercorrelations it was decided to retain five scores for the analyses: (a) a Proposal Quality score; (b) a Proposal Quantity score, indicating the number of words in the Proposal; (c) a Fable Quality score; (d) a Title score, that is, a score for title's originality; and (e) a Conflict score, indicating the extent to which

conflicts between the interests of sea and land forces were recognized and handled in the fable.

Questionnaire measures. At the close of each session, after the subjects had been given the information about the supposed success of their groups, the subjects completed some questionnaires designed to measure subjective experiences of the group members as well as several behavioral aspects of the group process.

1. Post-meeting questionnaires. After each session, Ss rated their group on a 17-item Group Atmosphere scale and on a 14-item post-meeting questionnaire. Leaders' and members' responses on these questionnaires were separately factor analyzed. The three factors identified for the leaders' responses were (a) Acceptance, (b) Hedonic Tone, and (c) Interpersonal Security. In the members' responses five factors were identified. These were (a) Hedonic Tone, (b) Task Motivation, (c) Friendliness of the Group, (d) Interpersonal Relations, and (e) Acceptance.

2. Behavior Description Questionnaires. In addition to the post-meeting questionnaires, a Behavior Description Questionnaire was administered after the second session. This scale consisted of 16 items indicating behavior typical of "Initiation of Structure" and "Consideration" techniques. Each subject rated himself and others on this scale. Responses to this questionnaire were factor analyzed. For both the ratings of self and the rating of others, the expected independent factors of Initiation of Structure and Consideration emerged. Consequently, Initiation of Structure and Consideration scores were obtained for each rating by summing up the items loading on each of the two factors.

This procedure generated for each group of subjects two matrices of scores, one for Structure scores and one for Consideration scores.

Target Member (Rates)

		A	B	C
Initiator	A	x_{aa}	x_{ab}	x_{ac}
Member (Rater)	B	x_{ba}	x_{bb}	x_{bc}
	C	x_{ca}	x_{cb}	x_{cc}

(In this matrix x_{ab} designates the score given by member A to member B.)

From these matrices, five group scores for Structure and Consideration were derived:

1. the description of the leader by the members: $x_{ba} + x_{ca}$;
2. the description of the members by the leader: $x_{ab} + x_{ac}$;
3. the description of the members by the other member and the leader: $x_{ab} + x_{cb} + x_{ac} + x_{bc}$;
4. the self-description of the leader: x_{aa} ;
5. the self-description of the two members combined: $x_{bb} + x_{cc}$.

3. Esteem scores. After the second session Ss described each other on the same 17-item rating scale on which they had rated the Group Atmosphere. Scores for each rating were obtained by summing up the item scores. Two group scores were derived from these scales: (a) a mean Esteem score for the leader, i.e., the sum of the esteem scores of the two group members describing their leader; and (b) an Esteem score for the members by the leader, which was the sum of the esteem scores of the leader for his two members.

4. Anxiety scores. The anxiety scale obtained in the pretest was repeated after the first group session. Postanxiety scores and a change score between pre- and post-test were computed according to the scoring key constructed by Alexander and Husek (1962).

5. Punitiveness question. The postmeeting questionnaire after the second group session contained a multiple choice item asking for reasons why the group might have failed (if it did). The alternatives were (a) the task was too difficult (impunitive), (b) I could not make useful contributions (intrapunitive), and (c) others did not make useful contributions (extrapunitive).

6. Sociometric rating. Four sociometric questions were given. From these responses, a score was obtained indicating the number of choice for the leader.

Observation Measures. In all group sessions, an observer was present who noted at what time and for how long which person spoke; this observer tape-recorded the sessions. Although the observers were aware of the stress condition under which the group operated, they did not know the LPC and intelligence of the leader. Eight observers participated in the study; the sessions they observed were counterbalanced over the design.

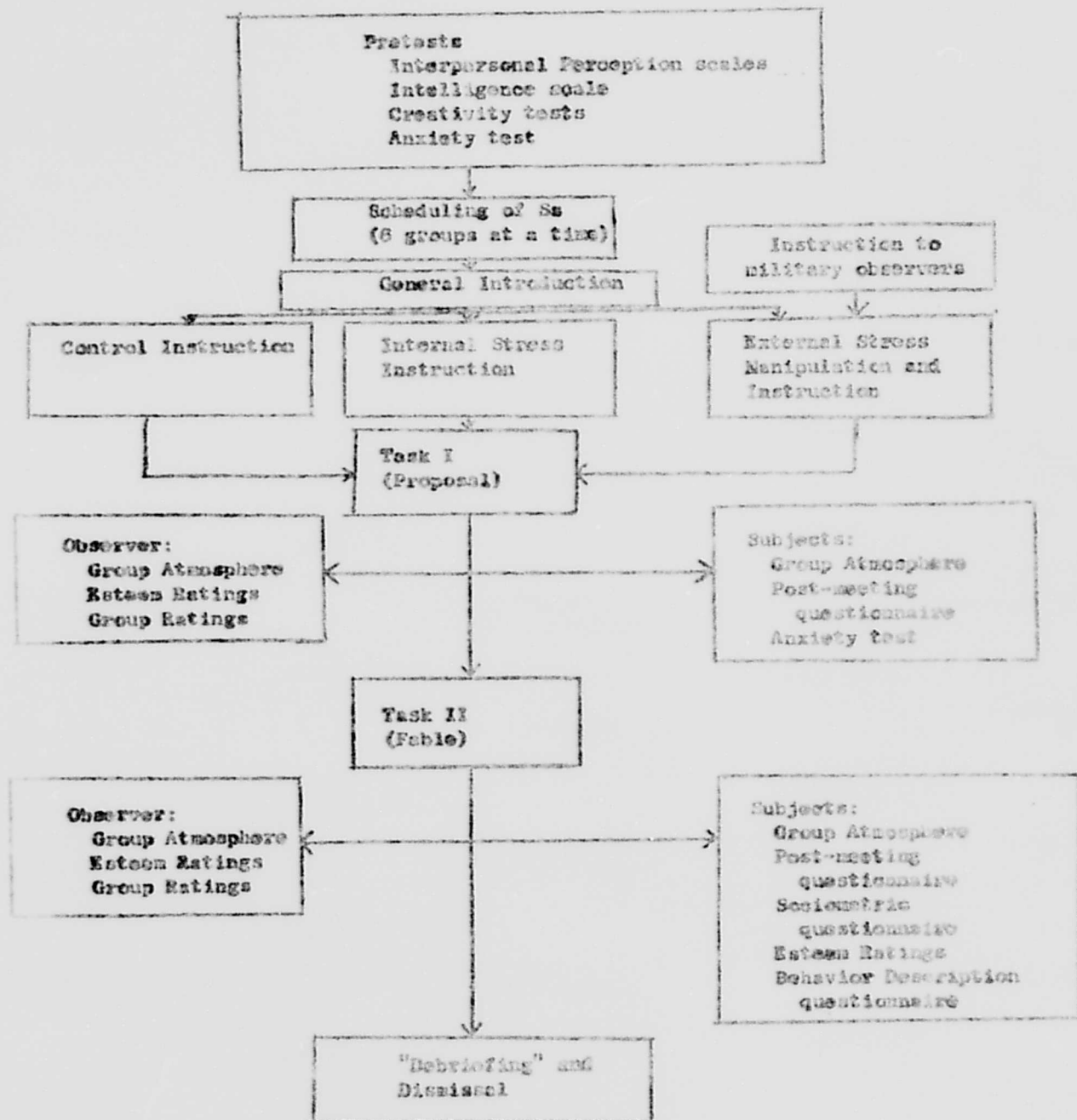
1. Group description scales. After each session, the observers completed Group Atmosphere scales as well as an eight-item group rating scale adapted from Lanzetta et al. (1954). Responses to these scales after the first session were analyzed. The four factors identified in these data were (a) Task Effectiveness, (b) Interpersonal Harmony, (c) Cohesiveness, and (d) Hedonic Tone.

2. Esteem scores. Following each session, the observers also described the leader and the two members on the 17-item rating scale used by Ss. So that rater bias would be eliminated, the esteem scores were standardized separately for each rater. These standard scores were used for the analyses.

Proceedings in the experiment are summarized in Table 2.

Table 2

Flow Chart of Proceedings in the Experiment



Analyses. Hypothesis 1 was tested by a study of the five performance scores mentioned above in a three-factor analysis of variance design. Sources of variation were (a) LPC of the leader (high or low), (b) stress condition (Control, Internal Stress, or External Stress), and (c) a control factor introduced to decrease the error term (Lindquist, 1956). This control factor was the intelligence of the leader, of the members, or of the group, whichever had the highest correlation with the performance score under study.

Hypothesis 2 was tested by correlating the leader's and the sum of the members' intelligence and creative ability scores with Proposal and Fable Quality scores within each of the six cells of the design.

Hypotheses 3 and 4 were tested by a study of questionnaire responses, esteem scores, and scores derived from the Behavior Description Questionnaires in a three-factor analysis of variance design with (a) LPC of the leader, (b) intelligence of the leader (high, medium, and low), and (c) stress condition as sources of variation. The results were interpreted in conjunction with the results from the factor analyses of the questionnaires. Relevant for Hypothesis 3 is the leader LPC main effect from the analysis of variance. The interaction between leader LPC and leader intelligence pertains to Hypothesis 4. The "stress" factor is introduced in these analyses so that the error term is decreased.

III. Results

Hypothesis 1: Leader Attitudes and Group Performance

The first hypothesis postulated a positive relationship between LPC of the leader and group performance in the Control condition for both tasks and in the Internal Stress Condition for the Proposal task. A negative relationship between these variables was expected in the Internal Stress

condition on the Fable task. No relationship was expected in the External Stress condition. Tables 3 and 4 summarized results from the analyses of variance on performance scores.

A significant interaction between LPC of the leader and stress condition appeared on the Qualitative Proposal score (Table 4). In the Control condition, low LPC leaders had better performing groups than did high LPC leaders who had better groups in the Internal Stress condition. Differences between high and low LPC leaders in the External Stress condition were not significant.

These results confirm Hypotheses 1c and 1d. The high LPC leaders would have more successful groups than the low would on a task in which differences in task attitudes generated stress, although there would be no differences between high and low LPC leaders in the External Stress condition.

The Control condition was expected to be relatively relaxed. No divergent attitudes were deliberately evoked, and a positive relation between LPC and group performance was predicted for this condition (Hypothesis 1a). The result was in the opposite direction. However, examination of the Group Atmosphere scores revealed that the mean GA score in the Control condition was not significantly different from that in the Internal Stress condition, or from conditions of stress created in previous experiments. It must, therefore, be concluded that the instruction failed to create a relaxed atmosphere. Given that a really relaxed, tension-free atmosphere could not be experimentally developed, the findings are consistent with previous results.

As Table 4 shows, the interaction of LPC and stress condition is due to the variation in the performance of groups with low LPC leaders only.

Table 3

Mean Performance Scores for Groups with
High and Low LPC Leaders

Criterion	High	Low	F ¹	p ²
Qualitative Proposal score	91.3	94.5	.22	n.s.
Quantitative Proposal score	55.5	59.3	.46	n.s.
Qualitative Fable score	96.9	111.4	5.63	<.025
Title score	12.2	14.6	3.13	<.10
Conflict score	7.3	6.6	1.41	n.s.

1) Df = 1/36

2) Probability associated with F for the main LPC effect in the analysis of variance.

Table 4

Mean Performance Scores for Groups with High and Low
LPC Leaders Under Different Stress Conditions

Criterion	LPC	Control	Internal Stress	External Stress	F ¹	p ²
Qualitative Proposal score	high	86.1	95.9	91.9	3.49	<.05
	low	113.4	80.7	89.3		
Quantitative Proposal score	high	57.1	54.7	54.7	.06	n.s.
	low	59.8	61.2	56.8		
Qualitative Fable score	high	96.9	96.0	97.7	.70	n.s.
	low	108.8	110.2	115.2		
Title score	high	13.2	11.0	12.4	.30	n.s.
	low	14.7	12.8	16.2		
Conflict score	high	9.4	6.2	6.4	2.17	n.s.
	low	6.7	6.9	6.1		

1) Df = 2/36

2) Probability associated with F for the interaction of LPC and condition in the analysis of variance.

The different stress conditions seemed to influence the behavior of low LPC leaders to a greater extent than they did that of high LPC leaders.

A significant main effect for LPC was found on the Qualitative Fable scores (Table 3). In all three conditions, groups with low LPC leaders performed better than did groups with high LPC leaders; their performance supported Hypothesis 1b for the Internal Stress condition. Results in the Control condition were again contrary to the prediction. Hypothesis 1d was not confirmed for this task. On this relatively neutral task, perhaps the external pressure was less salient for the subjects than it was on the previous Proposal task.

The Title score shows the same difference between high and low LPC leaders that the Fable score shows, although the difference is of only marginal significance ($p < .10$). No difference for either Conflict or Quantity scores was found between groups with high and low LPC leaders.

We may conclude, therefore, that (a) the more task-oriented, directive low LPC leader has more successful groups than the high LPC leader has when interpersonal stress is present in the group, (b) the low LPC person is a poorer leader than the high LPC person when task stress is generated, and (c) LPC of the leader has no effect on group performance if the group is under external pressure. These effects seem to apply only to the quality of the group's performance, not to the quantity of production, i.e., number of words written.

Hypothesis 2: Ability and Group Performance

Leader ability and group performance. It was hypothesized that the intelligence of the leader would correlate positively with group performance in cohesive groups only. Correlations were computed between the leader's

ability scores and Qualitative Proposal and Fable performance scores within each cell of the design. Most of the correlations were low and insignificant; however, it is particularly interesting to note that the leader's intelligence correlated positively with group performance in the Control and Internal Stress conditions, but not in the External Stress condition. Insofar as the data indicate any trend, they support Hypothesis 2 based on Fiedler and Meuwese's (1963) findings; these results showed that the leader's intelligence correlated with group performance only if the group is cohesive and relatively free of tension. Groups in the Control and Internal Stress conditions were indeed more cohesive than those in the External Stress condition, as will be shown later.

To explore further the general hypothesis that the ability of the leader is conducive to group performance only if the leader is free of tension, we correlated the change in anxiety of the leader on the one hand with the correlations between each ability variable and each criterion on the other. Change in anxiety was measured as the sum of the item differences on Alexander and Husek's (1962) test for situational anxiety, between pretest and posttest. These correlations are generally negative, irrespective of ability or criterion. Thus, the leader's ability to influence group performance seems to be in part contingent on his freedom from anxiety (Table 5).

Member ability and group performance. The average ability scores for the two members in the group were treated in the same manner as the leader's. Although most of the correlations were low and insignificant, it is especially noteworthy that the members' intelligence showed a high positive correlation with performance on the Proposal task under the External Stress

Table 5

Correlation between Anxiety Level of the Leader and the
Correlations between his Ability and Group Performance

	<u>Proposal</u>	<u>Fable</u>
Intelligence	-64	-49
Qualitative Creativity	-49	-66
Quantitative Creativity	-36	-72
Fluency	20	-49

N = 6

condition. The same relation, although weaker, was found between members' intelligence and performance on the Fable.

It will be recalled that the leader's intelligence correlates with group performance in Control and Internal Stress conditions, but not in the External Stress condition. In the latter condition the members' intelligence scores affect performance. No systematic relations were found between average creativity of the members and group performance.

Correlations were also computed between the difference in the leader's pre- and post-test anxiety scores (i.e., the leader's task-related anxiety) and the correlation between members' ability and group performance. Most of these correlations were positive, whereas the correlations between leader tension and the leader's contribution to the task were negative. A tentative interpretation would be that the leader's abilities contribute directly to group performance only if he is not anxious. When he is anxious, the members' abilities determine to a larger extent the group's performance.

The leader's level of tension apparently constitutes an important determinant of his ability to utilize his talents and those of his members in the performance of the group task. Prior studies have pointed out that the leader's level of tension determines also the strength and direction of the relation between his interpersonal attitude (LPC) and performance. Table 6 integrates these results.

A correlations between a particular attribute of an individual and group performance was interpreted as indicating influence over the group process and thus over the level of output. To what extent a particular attribute determines group performance depends in large part on the leader's anxiety during the group process. If the leader is tense and anxious, a task-oriented, directive attitude will be conducive to group performance.

Table 6

Relations Between Anxiety of the Leader and Influence
of LPC and Ability on Group Performance

	Leader feels:	
	Secure	Anxious
Leader attitude (LPC)	Task-oriented attitude (Low LPC) is detrimental to group performance	Task-oriented attitude (Low LPC) is conducive to group performance
Leader ability	Positive influence of leader's ability on group performance	No influence of leader's ability on group performance
Member ability	No influence of members' ability on group performance	Positive influence of members' ability on group performance

We can make this inference from the negative relation between LPC of the leader and group performance in groups in which the leader expresses tension on the Group Atmosphere scales. The present analysis suggests that the abilities of the members influence task performance in such a situation. If the leader remains secure in the group situation, his own ability has a direct impact on group performance and the members' abilities seemingly do not directly influence the task product.

Hypothesis 3: Leader Attitudes and Group Process

The third hypothesis postulated differences in group process between groups with high and low LPC leaders. Results of the analysis of questionnaire items are here briefly summarized. For a detailed description of the analysis, the reader may refer to Meuwese (1964).

Very few general differences in measures of process and interpersonal relations obtained between groups with low and high LPC leaders, and many results were only marginally significant. The data suggest that, in the second session, the high LPC leader felt more accepted than the low LPC leader, that the high LPC leader was rated by his members as more considerate than the low, and that members of groups with high LPC leaders also rated each other and themselves as more considerate. Moreover, members of groups with low LPC leaders were more anxious than members of groups with high LPC leaders.

On the Proposal Task, observers rated groups with low LPC leaders as more productive and efficient than groups with high LPC leaders. Analysis of individual items from the Behavior Description Questionnaire revealed that members of the low LPC leader's group saw him as more interrupting ($p < .02$), whereas he saw himself to a greater extent as having prodded the group to complete the task ($p < .05$). Members of low LPC leaders were described as more nervous ($p < .02$) and also as more interrupting ($p < .05$).

Analysis of a multiple-choice question asking for reasons for failure of the group - if it did fail - revealed that the high LPC leader gave more reasons manifesting an intrapunitive attitude, whereas the low LPC leader was more extrapunitive.

These results suggested the following observations: low LPC leaders are indeed the more task-oriented, they have more efficient groups, and they create a more goal-oriented, tense climate in the group. Their members feel less secure in the situation compared with members of groups with high LPC leaders. High LPC leaders are more considerate and create in the group a more considerate, tension-free climate. They provide more security for the group members, by whom they feel more accepted than do low LPC leaders. This set of results can be seen as a partial substantiation of Hypothesis 3, as well as previous interpretations of the LPC score.

Hypothesis 4: Interaction of Leader Attitudes and Leader Intelligence

With Group Process

Hypothesis 4 postulated an interaction effect of LPC and intelligence of the leader with measures of group process and interpersonal relations. Scores derived from the questionnaire responses were the basis of the analysis of this interaction.

Leader responses showed a systematic interaction in both sessions on the Acceptance and Hedonic Tone factors. The members' responses showed the same interaction on the Interpersonal Relations factor. Unintelligent high LPC leaders and intelligent low LPC leaders felt more accepted by their groups, which they rated as emotionally more pleasant. Members of groups with unintelligent high LPC and intelligent low LPC leaders appeared to enjoy better interpersonal group relations. The observers indicated the same interaction in their responses in the first session on the Interpersonal Harmony and Cohesiveness factors, in the second session on the Cohesiveness factor only.

Unintelligent high LPC and intelligent low LPC leaders were rated by their members as higher on the Consideration dimension, whereas the members in groups with unintelligent high LPC and intelligent low LPC leaders rated each other as higher on both the Initiation of Structure and Consideration dimensions. Unintelligent high and intelligent low LPC leaders esteemed their members more highly, and their members esteemed them more. The observers' esteem for the leader was in the same direction, but significant only for the Fable task. Anxiety scores were in the expected direction: intelligent high LPC and unintelligent low LPC leaders had the highest anxiety scores; but this result was not significant.

To summarize, if the leader is intelligent and has a low LPC score, or if the leader is relatively unintelligent and has a high LPC score, he tends to feel accepted and to experience a pleasant group atmosphere. His members have good interpersonal relations in a group that is harmonious and cohesive. Leaders and members are considerate, and members initiate task structure. Leaders and members esteem each other highly.

If the leader is relatively unintelligent and has a low LPC score, or if he is intelligent and has a high LPC score, he feels less accepted and experiences the group atmosphere as more tense. Interpersonal relations between members are poorer. There are conflicts in the group, and it is less cohesive. Leaders and members are less considerate of each other, and lack high mutual esteem.

Although intelligence and interpersonal attitude (LPC) of the leader do not interact systematically on the objective group performance scores, there clearly is such an interaction on indices reflecting group process and interpersonal relations. When intelligence and interpersonal attitude of the leader are incongruent (that is, when he has a task-oriented attitude but low intelligence required for the task performance, or a group-oriented attitude and high intelligence that would make him

potentially less effective on the task), the leader feels less adjusted, interpersonal relations are poorer, and the group has more conflict. The obverse is true when intelligence and interpersonal attitude of the leader are congruent.

These analyses suggest that intelligence and esteem for the least-preferred coworker can both be seen as predictors of interpersonal responses and subjective experience in a social situation. If the interpersonal responses associated with these traits are compatible, they reinforce each other and the effect on group process, and interpersonal relations is beneficial. When these traits are incompatible, the social behavior associated with them may produce a state of tension or dissonance in an interpersonal situation, and there is a detrimental effect on the group's process and interpersonal relations.

These interpretations are, of course, highly tentative and need cross-validation with more direct measures of group process and interpersonal behavior. The data demonstrate convincingly, however, that various individual attributes of the leader, such as intelligence and interpersonal attitude, have a complex effect on group processes and interpersonal relations.

IV. Discussion

Limitations of the Study

The generalizability of the findings in this study is limited by several factors:

1. Differences in stress realized in this experiment were fairly great insofar as this is possible only within the context of laboratory studies. No prediction can be made about the relationships investigated in situations of extreme stress.
2. The subjects constituted a highly selected group. The use of senior ROTC students attenuated the range of intelligence. No prediction about the relationships of intelligence with group performance can be made, therefore, for groups in which the leader has a very low intelligence.
3. Only two moderately correlated tasks were used, both of the intellectual discussion type. Subsequent studies should investigate the generalizability of the results over a larger domain of group tasks.

On the other hand, it must be emphasized that this study was part of a program of studies investigating the determinants of group effectiveness. Predictions derived from earlier studies in this program were confirmed, and interpretations could be extended to include the effects of specific types of stress on the relationships between individual attributes of the leader, leadership behavior, and group performance. Although this study per se is of limited scope, its implications are more compelling because they build from and contribute to the broader research program. Granting these limitations, what are the contributions of this experiment to our knowledge of group process?

Leader LPC, Interpersonal Stress, and Group Performance

This study has shown the existence of a complex relationship between the interpersonal attitudes of group leaders and objective ratings of group effectiveness on discussion tasks. As hypothesized, leaders with low scores on the "Esteem for the Least-Preferred Coworker" (LPC) scale had effective groups under conditions of moderately strained interpersonal relationships. Leaders with high LPC scores had effective groups if the group was working on a task that aroused divergent attitudes among the members.

It was hypothesized that the effectiveness of high LPC leaders in the Internal Stress condition is due to properties of the particular group-task situation. This hypothesis is supported by data bearing on the difference between leader and member responses to the group situation under the several stress conditions. Contrary to expectation, the Internal Stress condition was not rated as more unpleasant than the Control condition. On the second neutral task, the low LPC leader was more effective than the high LPC leader in the Internal Stress condition. However, no significant changes in questionnaire scores, such as changes in the level of Hedonic Tone, were found for these groups from the first to the second session. Therefore, the difference in the LPC-performance relation between the Internal Stress and Control conditions and between the Proposal task and the Fable task within the Internal Stress condition cannot be attributed to differences in interpersonal relationships and group atmosphere only. It seems reasonable to assume, therefore, that the obtained relationship is due to the heterogeneous group membership, that is, the differences in opinion between Army and Navy cadets which were generated by the Proposal task.

A potentially divisive negotiation situation arouses conflict between members and possible threats to their security. This fact implies that management of the anxiety level in this group situation determines success. And this was actually the case. The high LPC leader reduced the anxiety level of his members in the Internal Stress condition, whereas the low LPC leader was not able to do so (Table 7). Also, members of groups with low LPC leaders were generally more anxious than those of groups with high LPC leaders. Since the anxiety test was given after the Proposal task, but before the Fable, these results apply specifically to the Proposal task.

In such a complex task as writing a proposal, the anxiety of the members can be assumed to hamper task performance (Lazarus et al., 1952; Lanzetta et al., 1954). The main task of the leader in this situation is to keep the anxiety of the members at a satisfactory level so that optimum performance can result. The data demonstrate that high LPC leaders are more capable of this tension management than low LPC leaders are, and that high LPC leaders' groups therefore tend to be more effective.

Leader LPC, External Stress, and Group Performance

The leader's LPC scores were not related to group performance in the External Stress condition on the Proposal task. Although one cannot support a null hypothesis, this result was again in line with those of earlier studies. We can interpret this phenomenon if we take into account the fact that groups in this condition were significantly less pleasant and cohesive than in the other two conditions.

Correlation between an individual and a group score was assumed to indicate direct control of that individual over the group product. Therefore it seems that the leader in this condition loses his direct power over the productive task process, and he must devote his efforts to group integration. In a threatening condition, such as is implied by the External Stress

Table 7

Mean Anxiety Difference Scores for Members in
Control and Internal Stress Conditions¹

	<u>Control</u>	<u>Internal Stress</u>
High LPC	-2.4	-2.9
Low LPC	-3.9	1.6

Interaction significant at $p < .10$.

1) A negative score indicates a decrease in anxiety from pre-test to post-test.

condition, management of group integration and interpersonal security may be a prerequisite for the group's productive process (Cf. Lanzetta et al., 1954). On the basis of the interpretation of the LPC score, one would expect the high LPC leader to be more capable of increasing group integration and hence to be more effective; but the results do not confirm this expectation. It is, however, possible that leaders under external stress do not actually behave toward their coworkers as their LPC score would imply they might.

One correlate of the LPC (or ASo) score is the discrimination that the leader makes between his actual coworkers (Golb and Fiedler, 1955). Thus, low LPC leaders should discriminate more between their members than high LPC leaders should. To test this notion, the leader's discrimination between members on the 17-item Esteem scale was expressed in a profile difference (D) score (Cronbach and Gleser, 1953). Discrimination scores were higher for low than for high LPC leaders only in Control and Internal Stress conditions. It is therefore possible that the leader's ability to discriminate in his interpersonal attitudes becomes attenuated in a situation of external stress. A study by Fiedler et al. (1964), comparing groups under a "relaxed" and an "external pressure" condition, substantiates this interpretation. The results showed that differences in group process and interpersonal relations between groups with high and low LPC leaders existed only in the relaxed condition. No effect of LPC on these variables could be demonstrated in the external pressure condition.

Leader Ability, Stress, and Group Performance

Task-relevant abilities of the leader, such as intelligence, were found to predict group performance only in the Control and Internal Stress conditions. But groups in these conditions were found to be relatively pleasant

and cohesive. External Stress resulted in relatively uncohesive groups. This result again confirmed a hypothesis based on earlier studies.

As mentioned before, a correlation between a leader ability score and group performance can be interpreted as measuring the leader's direct influence over the processes relevant to task performance. Thus, the leader has this direct influence only when the group is cohesive. The amount of direct influence of the leader on group performance was found to depend on his anxiety level. The more anxious the leader was, the less his influence, and the more the group performance was controlled by the group members' abilities. It is impossible to derive the causal direction of this relationship from the data; and several explanations are, therefore, equally tenable. One possibility is that more powerful members assume task leadership at the cost of the leader's position in the group. This loss of power for the leader results in increased tension. Another possibility is that the more anxious leader who is more dependent than the more secure leader, utilizes the abilities of his members to a greater extent. The more anxious leader may well assume a less directive attitude and be more information-seeking or submissive in appealing to his members for assistance. These speculations are highly tentative and subject to further test.

Leadership and Group Process

Differences found in this study between high and low LPC leaders and groups consistently point to the conclusion that high LPC leaders are more considerate than low LPC leaders are in their behavior toward the members in the group. High LPC leaders listen attentively, orient themselves to what their members have to contribute, are more relaxed, and do not demand such high levels of task performance. Consequently, groups with high LPC leaders have members who are more considerate toward each other than are

members of low LPC leaders' groups. On the other hand, it was not found that the low LPC leader or his groups are significantly higher on the Initiation of Structure dimension than the high LPC leader or his groups. The third hypothesis in this study is therefore only partially confirmed.

In situations such as those created in this study, which involve problem-solving tasks, it can probably be assumed that all people are oriented toward the task and the problem-solving process. This process may, however, have a different character for high and low LPC leaders and groups. In addition to orienting the group toward optimum task performance by initiating structure and maintaining standards of good task performance, the high LPC leader may use techniques to reduce anxiety, to create a pleasant atmosphere and interpersonal relations, and generally to maintain a cohesive group.

The high LPC leader has been described as being "quasi-therapeutic" (Fiedler, 1963; Julian, 1963; Myers, 1961). Quasi-therapeutic behavior is defined as behavior aimed at reduction of interpersonal tension and intra-group conflict, and generally at increasing the level of security and adjustment of others in an interpersonal situation. The results of this study substantiate this hypothesis.

It must be recognized, however, that quasi-therapeutic, or considerate, behavior is not always appropriate in a task situation. This behavior increases the effectiveness of the group only if a reduction in anxiety level is instrumental for effective group performance. In a task situation in which the level of interpersonal tension is low and the members are initially motivated to achieve the task goal of the group, considerate quasi-therapeutic behavior may distract the members from an effective task process. In such a situation the low LPC leader who successfully manages and controls the task situation is more effective. A more general theoretical model has recently been presented by Fiedler (1964, 1965) in

the form of his Contingency Model, which presents an integration of these findings with previous work.

Interaction of Leader LPC and Intelligence with Group Process

Intelligence of the leader was found to interact with the leader's LPC on measures of group process. Specifically, intelligent low LPC and relatively unintelligent high LPC leaders had a beneficial effect on group process and interpersonal relations. It cannot be deduced from the available data that the behavior of bright low LPC and unintelligent high LPC leaders is similar. The consequences of this behavior on measures of esteem and subjective experience are, however, similar. The data show consistently that unintelligent high LPC leaders and intelligent low LPC leaders are judged more favorably, and their effects on the group process are more satisfactory to the members.

A possible explanation of this result is that high intelligence in an intellectual task situation gives the leadership technique of the low LPC leader more impact because his structuring and controlling behavior is reinforced by higher competence in the task itself. On the other hand, high intelligence might hamper the quasi-therapeutic, considerate behavior of the high LPC leader, because in a task situation high intelligence very likely makes the leader impatient to contribute directly to the task performance. This is incongruent with his disposition to maintain interpersonal security.

Implications and Conclusions

This study has yielded consistent relationships between a cognitive and an affective attribute of the leader of a group on the one hand, and group performance and process on the other. Strength and direction of the relationships, however, were shown to be dependent upon the type of stress in the group.

This study has again shown that the attitude of a leader toward his coworkers (LPC) predicts his leadership style. Different attitudes toward coworkers thus imply different techniques of handling group members and group interactions. Although utilization of a specific leadership style is characteristic of the individual, the effectiveness of any particular style is dependent upon group and environmental variables. Hence it cannot be said that a specific leadership style, either considerate and nondirective, or managing and controlling, is generally conducive to effectiveness of groups working on intellectual tasks. When one considers the probability that a particular leadership style will be effective, he must take into account how much stress is in the group-task situation, and the source of this stress.

Intelligence of the leader, in its effect on group performance, interacted both with the degree and type of stress in the group-task situation and with the interpersonal attitude of the leader. Contrary to a commonly held belief (e.g., Mann, 1950), high intelligence of the leader may be sometimes detrimental to the effectiveness of interpersonal relations in the group. This effect may be seen in situations in which the competent, direct contribution of the leader to problem-solving, implied by high intelligence, is incongruent with a primary requirement for maintaining interpersonal security. This situation exists in groups in which the task generates conflict.

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APPENDIX A

Questionnaires

Esteem for the Least-Preferred Coworker (LPC) Scale

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

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

Sample Scale:

Pleasant: 8 : 7 : 6 : 5 : 4 : 3 : 2 : 1 : Unpleasant

The other adjectives were: friendly-unfriendly; rejecting-accepting; helpful-frustrating; unenthusiastic-enthusiastic; lots of fun-serious; tense-relaxed; distant-close; cold-warm; cooperative-uncooperative; supportive-hostile; boring-interesting; quarrelsome-harmonious; self-assured-hesitant; efficient-inefficient; gloomy-cheerful; and open-guarded.

Note: These same scales were used for the description of Group Atmosphere, for the members' description of each other, and for the observer's description of leader and members.

Post-meeting Questionnaire

Each question was answered on an eight point scale, as follows:

1. Did you enjoy being a member of this group?

Very much: 8 : 7 : 6 : 5 : 4 : 3 : 2 : 1 : Not at all

The other questions were:

2. Did the other group members seem to like and accept you?
3. Did you feel relaxed and comfortable?
4. Are you satisfied with your own contribution to the group task?

5. Were you irritated with one or both other members of the group?
6. Did you find this task interesting?
7. Was it important to you that your group would be among the best?
8. Did you feel anxious or tense in this session?
9. Did you have difficulty communicating your ideas to the group?
10. Were there many times during the session when you felt that the group was at a dead end?
11. How well do you think your group performed in comparison with other groups?
12. How well do you think your group will do on the next task?
13. How well did the chairman do his job?
14. Please indicate on the following scales how much you liked to work with each member of your group. (One global rating scale for each of the other members. Scores on these two scales were added to provide a cohesiveness measure).

Observer Rating Form

Each aspect was rated on an eight point scale, from "little" to "much". The aspects rated were:

1. Goal orientedness
2. Productivity
3. Degree of equal participation of the members
4. Degree of conflict in the group
5. Amount of informal friendliness
6. Communication effectiveness
7. Competition between members
8. Cohesiveness of the group

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Sociometric Questionnaire

Circle the letter of the one person in your group, including yourself, to whom each of the following questions best applies.

Circle only one letter for each question

- | | | | |
|--|---|---|---|
| 1. Who had the most influence in the group? | A | B | C |
| 2. In another group session like this, whom would you most like to have as a leader? | A | B | C |

Circle the letter of the one person in your group, not including yourself, to whom each of the following questions best applies.

- | | | | |
|--|---|---|---|
| 3. With whom in your group would you most like to work on a continuous task similar to this? | A | B | C |
| 4. Whom, in your group, would you most like as a personal friend? | A | B | C |

Punitiveness Question

To the extent that you were dissatisfied with the group's products, what was the main reason (CHECK ONE):

- (a) The task was too difficult
- (b) One or more of my coworkers did not make useful contributions
- (c) I could not make very useful contributions
- (d) I was entirely satisfied with the group's products

Behavior Description Questionnaire

Instruction:

Listed below are a number of statements which may describe the members of your group. Show how much you think a statement describes each of them, including yourself, by writing their letters on the scale beneath the item.

For example, you would place the letters A, B, and C on the scale below in such a way as to show what you think the relative height is for the members of your group. Suppose your letter is C, that member A is very tall, and that member B and you are both medium sized. Then for this practice item you would arrange the letters as they appear below.

He is tall.

:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
:	A	:	:	:	:	:	B	:	C	:	:	:	:	:	:	:	:	:	:	:
:	Very true	:	Generally	:	Moderately	:	Somewhat	:	Not at all	:	:	:	:	:	:	:	:	:	:	:
:	of him	:	true of him	:	true of him	:	true of him	:	true of him	:	:	:	:	:	:	:	:	:	:	:

Or, if you think that every member of your group is tall, but that member A is the tallest, B next tallest, and you are the shortest member of the group, you would arrange the letters as they are below.

He is tall.

:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
:	A	:	B	:	C	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
:	Very true	:	Generally	:	Moderately	:	Somewhat	:	Not at all	:	:	:	:	:	:	:	:	:	:	:
:	of him	:	true of him	:	true of him	:	true of him	:	true of him	:	:	:	:	:	:	:	:	:	:	:

The statements were:

1. He prodded the group to complete the task
2. He was the real "idea man" in the group, suggesting new ways of handling the group's problem
3. He is a creative person
4. He was concerned only with his own ideas and viewpoint
5. He listened attentively to others
6. He influenced the opinions of others

7. He interrupted others when they were speaking
8. He criticized those with whom he disagreed
9. He was the real leader of the group
10. He worked well with others in the group
11. He was disruptive to the group
12. He was in the forefront of the group's discussion
13. He kept the group from straying too far from the topic
14. His attitudes hurt the group's chances of success
15. He seemed to be a tense, nervous person.

APPENDIX B

Group Performance Criteria

The performance of the groups on the Proposal task was rated by three judges on seven aspects: (a) feasibility, (b) defense of the proposal, (c) elaboration, (d) logical structure, (e) sentence structure, (f) expressiveness, and (g) persuasive power. Ratings on these seven aspects were highly intercorrelated, hence a weighted sum was computed for each group, giving aspects (a) through (d) a weight of 2, and (e) through (g) a weight of 1, and summing over aspects and judges for each group. The average correlation of .71 for this rating corrected for three judges gives an estimated reliability of .88 for the criterion score for the Proposal task.

Group performance on the Fable task was rated by five judges on eight aspects: (a) originality of the title, (b) creativity of the plot, (c) elaboration, (d) structure of the story, (e) sentence structure, (f) expressiveness, (g) humor and suspense, and (h) the amount to which conflict between the interests of land and sea forces were mentioned. Ratings on all aspects except (h) were highly intercorrelated, so a group performance score for each group was computed by summing all ratings for that group over all aspects except (h), and all raters. The average correlation between raters for this score was .64, corrected for five judges this gives an estimated reliability of .87 for the criterion score for the Fable task.

Besides these two "Quality" scores, the number of words in each written product was counted to yield a "Quantity" score. The intercorrelations between several performance scores are given in Table B-1.

Table B-1

Intercorrelation of Group Performance Scores

(N = 55)

Score	1	2	3	4	5	6
1. Proposal Quality	---	48	32	31	-01	02
2. Proposal Quantity	48	---	16	33	-02	07
3. Fable Quality	32	16	---	64	61	06
4. Fable Quantity	31	33	64	---	14	-04
5. Title Score	-01	-02	61	14	---	08
6. Conflict Score	02	07	06	-04	08	---

This table leads to five conclusions:

1. Proposal and Fable Quality scores are not very highly correlated. These two scores indicate relatively separate aspects of group performance.
2. Proposal Quality and Quantity scores are only moderately correlated, suggesting retention of both as "Quality" and "Quantity" scores respectively.
3. The "Conflict" score is independent of the other scores.
4. The "Title" score is correlated with quality of the Fable, but not with quantity, indicating that the total score for the Fable primarily reflected quality.
5. Fable Quality and Quantity scores are highly correlated. For this reason, only the Quality score was used in the analyses.

Hence, five criterion scores were retained for the analyses: (a) the Proposal Quality score, (b) the Proposal Quantity score, (c) the Fable Quality score, (d) the Title score, and (e) the Conflict score.