

1972

The Effects of Leader Presence and Moderate Stress upon Small Group Sentiment and Interaction

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Eastern Illinois University

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THE EFFECTS OF LEADER PRESENCE AND MODERATE
STRESS UPON SMALL GROUP SENTIMENT AND INTERACTION
(TITLE)

BY

Ray Lewis Gordon

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF

MASTER OF ARTS

IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY
CHARLESTON, ILLINOIS

1972

YEAR

I HEREBY RECOMMEND THIS THESIS BE ACCEPTED AS FULFILLING
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ACKNOWLEDGEMENTS

The writer is grateful to a number of people who contributed considerable time and effort to this study. Gratitude is extended to Dr. Calvin Smith for his excellent advisement throughout the study. Thanks are also extended to Mr. Charles Harrison and Mr. Charles Russell who aptly served as the leaders for the experiment. The writer would also like to thank Dr. Don Morlan for providing guidance during the writing of the paper.

A very special thanks is extended to Dr. Bruce Wheatley who consistently surpassed the duties of a committee member, and provided inspiration and guidance from the study's inception to its completion. Without the assistance of Dr. Wheatley, this study would not have been possible.

Finally, a very special thanks to my wife, Sue, for her patience and understanding, and for typing the final copies of the paper.

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CHAPTER I

INTRODUCTION

The Problem

The focus of attention by scholars on the small group has mounted rapidly in the years since World War II. The emphasis has evolved from the inception and development of the fields of psychology and sociology, and more recently, interpersonal communication ". . . attempting to introduce the methods of knowledge of the human sciences into the study of leadership" (Browne and Cohn, 1958, p. iii). There is a vast amount of literature concerning small group leadership which spans from the late 19th Century to the present. The majority of these reported investigations have centered around the elements of leadership and the effects of overt leader behavior on the functioning of small groups. Only a few investigations have dealt with the effects of covert leadership upon the inner-feelings of the participants in small group situations (cf. Wood, 1965; and Wheatley, 1966).

Problem-solving discussion groups are an integral part of many collective functions within the societal framework, whether they be a business, a classroom, a civic or social organization. Frequently the person who enjoys the status of "decision-maker" in the organization (who may be called a "leader" of the organization) seeks advice and even solutions to various problems from the outcome of ad hoc

discussion groups assigned to formulate the advice or solution(s). Additionally, the leader may desire that he not participate in formulating the advice or solution(s) in order to elicit the ideas of the group members rather than their reactions to his personal proposals. The advice or solution may be crucial and needed quickly, making it necessary to form the groups without advance notice to the members, and requiring them to function within a limited amount of time.

Should such a situation occur, the leader is faced with two significant problems. First, by what method of incentive can he elicit the most effective performance from the group? Second, would it be more beneficial to the functioning of the group if he remains present and contributes nothing (a "silent" leader), or if he withdraws altogether from the setting (an "absent" leader)?

A synthesis of previous research suggested, in hierarchical fashion, that perhaps the latter alternative to the second problem might be most beneficial. Homans demonstrated that within the internal system of the group, its effectiveness results from a mutual interdependence of three variables: sentiment, interaction, and activity (Homans, 1950, pp. 110-119). Wood (1965) revealed that a trainer seemed to have an appreciable effect on the participants in a training group, and also that the lack of a trainer had some effect. Within the realm of Homans' variables, Wood showed that the lack of trainer presence made the group:

. . . less competitive, more understanding, more willing to contribute to the group goals, friendlier, and more attracted to the group. Members in trainerless groups also interacted much more freely than did members of trainer-led groups (Wood, 1965, p. 117).

Wood, however, was concerned with the relationship between overt trainer participation and the trainerless conditions rather than the leader and leaderless conditions. He did not include the condition of a "silent" trainer.

Wheatley's study (1966), under the direction of Wood, replaced trainer and trainerless groups with problem-solving groups and incorporated two new variables, i.e. the "silent" leader condition (non-participatory -- non-supervisory), and anxiety (internally motivated stress). One of Wheatley's hypotheses was that leader presence (silent) and its resultant lower sentiment by group members was a result of increased anxiety produced by the style of leadership. His results did not support this hypothesis. He suggested that the lower sentiment may result from the degree of stress (task performed) associated with the group, not from the leadership behavior utilized (Wheatley, 1966, pp. 57-83).

Appley pointed out that there are two sides to the realm of stress: the state "arising from internal conflicts" (anxiety), and the "response to a temporary threat of external origin" (fear) (in Barnlund, 1968, p. 365). Lanzetta found that problem-solving discussion groups performed more effectively under a mild stress condition (Lanzetta, 1955, p. 50). The stress utilized by Lanzetta was a time limit

for performance of the tasks, imposed on the group from an external origin. The function of the stress imposed was to create a ". . .situational stress on the behavior of individuals interacting in small groups" (Lanzetta, 1955, p. 29), which would compliment a simultaneous induction of a motivational factor. It seems reasonable that if the presence of a leader has a demonstrable effect on the inner-feelings of the members of a group in terms of their sentiment, interaction, and activity, but not anxiety, this reduced sentiment, interaction, and activity may be a result of the external stress of the group situation.

The problem, then, to which this study was addressed was to discover the effects, if any, of leader presence and moderate stress upon small group effectiveness in terms of sentiment and interaction.

REVIEW OF SELECTED LITERATURE

For the purposes of this investigation, the review was limited to that research which has examined the "silent" and the "absent" styles of leadership in their relation to the effects of leader presence in small group processes. Additionally, literature of relevant experimental studies concerning stress, sentiment, and interaction were reviewed.

Styles of Leadership

Silent Leadership

The qualities of silent leadership in small, problem-solving groups are closely analogous to those of the human relations trainer in a T-group setting. That is, the leader, after having begun the discussion process, withdraws from participation and silently observes the group in action.

Wood was the first to make specific reference to the importance of the leader's presence. T-group research conducted by him at the University of Denver prompted the residual comment that:

The leader's presence seemed to be a more important factor than the leader's behavior. It is possible that the very presence of a perceived status figure creates an authority problem that inhibits interaction, increases competitiveness, and decreases the possibilities for self disclosure (Wood, 1965, p. 116).

While he did not pursue this area further, Wood suggested that, "Studies might be conducted to investigate the effect

of trainer-presence on sentiment and interaction in training groups" (Wood, 1965, p. 210).

Research conducted by Wheatley at the University of Denver was the first to incorporate the silent style of leadership in relation to problem-solving groups. While his purpose was not to specifically test the effects of leader presence, he noted that the silent leader condition did have an appreciable effect on the group members in terms of sentiment, status and esteem. He concluded that in the revealed sentiment of the subjects:

Competition, from the standpoint of the individual's perceptions of the competitiveness of others, was significantly higher among subjects in the silent condition. However, the atmosphere in the silent exposure was significantly more friendly. In addition, members were less willing to say they would have gained more from the session in another group (Wheatley, 1966, p. 83).

Concerning the status of the leader as perceived by the subjects, Wheatley noted:

Subjects ranked the participatory leader as being higher in status than both the supervisory and silent leaders. Moreover, subjects in the silent condition significantly ranked their leader as being lower in status than did subjects who ranked the participatory and supervisory leaders (Wheatley, 1966, pp. 101-102).

The ranked esteem of the leader followed much the same as that of the ranked status.

Subjects in the participatory condition significantly ranked their leader as being higher in esteem than did subjects in the supervisory and silent exposures. Participants in the silent condition significantly ranked their leader being lower in esteem than did subjects who ranked the participatory and supervisory leaders (Wheatley, 1966, p. 102).

Other than the research of Wheatley and the uses of this style of trainer in T-groups, silent leadership has yet to be analyzed in relation to leader presence. Further substantiation of this fact was pointed out by McGrath and Altman in their comprehensive survey of small group research reported. They concluded:

Notably, . . .there were no data in the sample on . . . what kind of effect, if any, the presence of a . . . leader has on task performance of group members (McGrath and Altman, 1966, p. 62).

Absent Leadership

The primary attributes of absent leadership for purposes of this study included an assigned leader who would begin the discussion process and then withdraw from the situation altogether, returning to close the discussion at a later time. The function was to counterbalance the silent leader approach in assessing the effects of leader presence.

The theoretical rationale for this style of leader function, was that (a) if the subjects were aware that a leader had been designated, and (b) if the variable acted upon them, the presence of the leader could be measured through analysis of the variables. The review indicated that leader presence in this style of leadership has yet to be explored. In fact, Wheatley's investigation was the only reported research to have utilized this approach.

Research most relevant to absent leadership is

embodied under the heading of "leaderless" groups. Hubert Bonner, in summarizing the leaderless approach, noted that:

A leaderless group is one in which several individuals are confronted by a problem that requires cooperation among its members for its solution, and in which no single individual becomes a focal person. . . In a leaderless group members are asked to carry on a discussion for a given period of time without a designated leader. The purpose is to assess leadership tendencies among its members as they participate in a free discussion (Bonner, 1959, p. 195).

Studies of leaderless groups have been concerned with either the emergence of leaders from within the group or with the traits of members in the situation where no leader has been designated.

Wheatley varied the purposes of this approach for his investigation.

Rather, it was the purpose of the investigation to require the absence of the leader in the leaderless exposure. Therefore, the alternative of simply not being present as a leader, here called "leaderless," was explored (Wheatley, 1966, p. 9).

The results revealed that the leaderless exposure acted in terms of sentiment and interaction.

Subjects receiving the leaderless condition felt less understood by their fellow group members. Leaderless subjects were more willing to say they would have gained more from the session in another group. However, the atmosphere in the leaderless group was significantly more friendly. Morale was highest as members were significantly more positive in their evaluation of the problem-solving ability of their groups (Wheatley, 1966, p. 83).

Interaction data were obtained by trained interaction observers counting the number of utterances made by each participant. Analysis of the results revealed that:

Participants in the leaderless conditions rated highest in interaction while subjects in the participatory condition rated lowest on this particular variable. Leaderless groups more than doubled the interaction rate of subjects in the participatory and supervisory conditions. No significant differences were found between participatory and supervisory; participatory and silent; supervisory and silent; and silent and leaderless groups (Wheatley, 1966, p. 87).

Wood (1965) discovered that the rate of interaction in his T-group experiments also varied significantly. The interaction rates in instrumented treatments not utilizing a trainer (the variable was a questionnaire), were about twice as high as those treatments utilizing trainer-critique and trainer-question variables. Additionally, he reported that:

The presence of the trainer seemed to be a highly relevant factor in group interaction. Even before the experimental variables had been introduced, interaction was much lower in groups that included a trainer. The proportion of utterances between conditions did not change significantly over the three periods (Wood, 1965, p. 83).

Wheatley drew the same conclusion for problem-solving groups. His research also indicated that:

The leaderless groups had the highest rate of interaction. In addition, although not statistically significant, the mean interaction of the silent condition was higher than the mean interaction of the participatory and supervisory conditions (Wheatley, 1966, p. 83).

This same researcher suggested that, "Future studies should be conducted to explore the effectiveness of this particular condition and its relationship to the inner-feelings of small group members."

Stress

Since Wheatley (1966) found there to be no interaction between internal stress (anxiety) and group leadership, the review was limited to literature concerning relevant research with externally imposed stress.

Rosenzweig defined external stress as having two qualities: passive and active. Passive external stress is one in which no threat to the organism is produced, e.g. the imposition of a time barrier; while active external stress directly threatens the group (cf. Rosenzweig, 1944, pp. 33-47). Bruner and Postman (1948) validated his definitions by effectively creating the two types of stress.

The work of Grinker and Spiegel (1945) documented the effects of stress on combat performance and motivation during World War II. They suggested that:

. . . one of the possible variables affecting a person's reaction to stress is the presence of other individuals with whom he must interact in the performance of some common task (cf. Lanzetta, 1955, p. 29).

Malmo, et. al., utilized electromyographic (EMG) equipment in the study of psychotherapeutic interviews. They used these machines to measure muscular tension of mental patients under praise or criticism, as well as those of the examiner-interviewer. The population used was 19 female mental patients with similar ailments of excess negative reactions to applied stress. Their analysis revealed that talking and tension directly correlated, or "The less the

patient talked, the more her tension fell" (Malmo, et. al., 1957, p. 116). However, the imposition of praise brought on more talking than criticism, which produced a reversal in correlation (minus 0.50 to pos. 0.49). Their explanation was:

It appears that the reversal in sign of correlation might reasonably be attributed to the fact that the examiner invited the patient to speak and therefore was fully prepared to accept her comment, and in fact was anxious to mark off a rest period of some 20 seconds unbroken by speaking. The amount of talking was nearly equal, it may be noted (an average of 20.72 words for E's part and 19.07 words for N's part) (Malmo, et. al., 1957, p. 117).

Berkowitz used a situational alteration process to impose stress on 48 female students at the University of Wisconsin in order to test their displacement of hostility-aggression in reaction to the stress. Two of his conclusions were of interest to this review. First, alteration of situation can be effective in producing stress. Second, his measuring device was found to be unusable. The device was the Manifest Hostility Scale (MHS) developed by Siegel.

More recent evidence points to important difficulties in the interpretation of scores on this scale. Two studies, conducted by Berkowitz, and Hekanson and Gordon, agree reporting a negative correlation between MHS scores and the increase in intensity of aggression-behavior after arousal (Berkowitz, 1959, p. 183).

The study by Lanzetta (1952) was found to be most relevant to this investigation. Lanzetta examined the relation between motivation and stress in groups. His results showed that no significant relation existed. Based on previous studies and his own research, Lanzetta demonstrated

however, that an external threat, through the imposition of time limitations, could be successfully used to create situational stress. In his study, he created three conditions: non-stress, mild stress, and high stress. His mild stress was based on the imposition of a time barrier for the completion of the tasks (passive stress).

To make the time barrier more prominent the time remaining for completion of the task was called off to the subjects every five minutes, until only five minutes remained. In the last five minutes time remaining was told to the subjects at one minute intervals (Lanzetta, 1955, p. 32).

The high stress condition followed the format above, but had additional barriers imposed: badgering, belittling, restriction of work area, etc., producing active stress. His results demonstrated:

There was a decrease in negative-social emotional behaviors, in aggressions, deflations, dissatisfactions, competition, etc., and in self-oriented behaviors, under increased stress. There was an increase in positive, group-oriented behaviors such as cooperativeness, friendliness, group discussion, integrating acts, etc., under increased stress. These were interpreted as indicating that participants perceived the group as a source of security in the face of the external threat, and thus behavior which would lead to acceptance by the group was facilitated, while behavior which might lead to rejection was depressed (Lanzetta, 1955, p. 50).

Concerning the performance of the group in relation to the varying conditions, Lanzetta noted that:

Analysis of characteristics and behaviors related to performance indicated that the performance of the group was best under mild stress conditions.... (Lanzetta, 1955, p. 50).

Group Effectiveness

The review revealed that the effects of the independent variables, leader presence and stress, would be most evident through the demonstrated inner-feelings of the group members and the quantity of their interpersonal communication, i.e. the effectiveness of the group process.

Homans was one of the pioneer theorists concerning group effectiveness. His initial theory was outlined in 1950, and further substantiated in 1961 (Homans, 1950, pp. 33-40 and 1961, pp. 32-35). Wood provided a succinct summary of Homans' elements:

George Casper Homans identifies three variables that he feels represent the major elements in group effectiveness. These variables. . . are sentiment, interaction, and activity. Homans points out that sentiment, interaction and activity are distinct variables in that they can often be measured separately and, at the same time, they are interdependent. Their combined force determines whether or not a group meets its internal and external needs (Wood, 1965, p. 12).

Bernard Bass, another small group theorist, makes much the same kind of distinction when he writes that group effectiveness is a function of group attractiveness, member satisfaction, interaction effectiveness, and productivity (Bass, 1960, pp. 39-59). Bass also concludes that each of these elements contributes to group effectiveness and to each other (Wood, 1965, p. 13).

Wood and Goldberg (1968) demonstrated that activity was an extremely general concept and that its measurement

depended greatly upon, "inference from sentiment and interaction data" (Wood and Goldberg, 1968, p. 242). They further explained that:

Because of the small N, the judging data were not subjected to sophisticated statistical analysis. Instead, the means for each condition were visually compared to ascertain gross differences (Wood and Goldberg, 1968, p. 243).

For these reasons, and because little physical movement was required of the subjects in the problem-solving sessions, activity was not included as a dependent variable in this investigation. It was felt that sentiment and interaction would most accurately reveal the effects of the various exposures.

Sentiment

Theoretical Bases. In The Human Group, Homans advanced the theory that sentiments are internal and difficult to measure (Homans, 1950, p. 39), but later revised that theory.

Sentiments are not internal states of an individual any more than words are. They are not inferred from overt behavior: the are overt behavior and so are directly observable. They are, accordingly, activities. Because people say that they are outward and visible signs of internal states -- of attitudes and feelings men take toward other men -- we find it convenient to call them by a special term [sentiment] (Homans, 1961, p. 34).

Wood has summarized the theoretical framework concerning group sentiment as advanced by Homans; Cartwright and Zander; and Bass. He noted that Homans (1950, pp. 37-40):

. . . treats sentiment as a general term encompassing the sum of interior feelings that a group member has in relation to the group and what it does. Sentiment includes such basic sensations as hunger and thirst and such generalized feelings as sympathy, affections, and pride. In it are involved member satisfaction, group attractiveness, and cohesiveness. A study of sentiment deals with the feelings and attitudes that group members have toward each other, toward the group, and the activities of the group (Wood, 1965, p. 13).

In order to narrow the concept of sentiment for his and other studies into more easily handled elements, Wood turned to Cartwright and Zander (1962, p. 70). After examining their research, he concluded that:

. . . group cohesiveness, attraction of the group for its members, is a key factor in whether a group is 'healthy' or 'unhealthy.' They suggest that cohesiveness can be measured in terms of common goals, willingness of members to contribute to group goals, willingness to endure pain and frustration, and willingness to defend the group against external attack (Wood, 1965, p. 14).

Bass indicated that sentiment was linked closely to group attractiveness (roughly analogous to cohesiveness). Among others, Bass indicated that one method of measuring attractiveness is through verbal assessments.

Verbal assessments of attractiveness or cohesiveness of a group can be made by asking members to indicate the strength of their desire to remain in the group; how much less they would feel if the group disbanded, how hard it would be to keep them from attending meetings or to drive members out of the group; how much they would rather be in another group; how much time and energy they would be willing to invest in maintaining the group; how much they would resist transfer or removal; and whether they would apply or reapply for membership (Bass, 1960, p. 62).

Based upon his examination, Wood synthesized the concept of sentiment. He stated that:

Theoretically, then, sentiments in a group can be narrowed and observed in terms of elements that contribute directly to group effectiveness. The hypothetical position of Homans and others has been that sentiment contributes to effectiveness and effectiveness, in turn, is a powerful force in sentiment (Wood, 1965, p. 15).

Interaction

Theoretical Bases. Homans dealt with interaction much the same as he did with sentiment. He first discussed its broadest context, then narrowed it. He asserted that interaction is the relationship of the activities of one group member to the activities of another member, or, in other words, any related activity between two humans is interaction (Homans, 1950, pp. 35-36). Therefore, interaction is often considered to mean overt communication between two or more persons. Aside from rhetorical elements, then, the significant unit of interaction is, "...the sheer fact, aside from content or process of transmission, that one person has communicated with another" (Homans, 1950, p. 37). Wood added that:

This distinction allows for a fairly high degree of quantification of interaction attempts. The content of interaction or its utility to the group can be put aside, at least temporarily. The unit of concern becomes simply the act of communication from one person to another person or to a group (Wood, 1965, p. 17).

Concerning the measurement of interaction, Homans argued that often the best means of measuring interaction is in terms of the number of units per unit of time (Homans, 1961, p. 38). The rationale is quite relevant to the

present investigation.

In this book the one thing we shall never be is methodological snobs. We shall never assume that "crude" is a synonym for "unreliable." No piece of research that is interesting for other reasons shall we reject just because someone has said its methods are unsophisticated. The choice of methods is an economic problem like any other. The methods of social science are dear in time and money and getting dearer every day. Sometimes they cost more than the data they bring in is worth in enlightenment. The propositions about social behavior for which they provide evidence are themselves crude, and the data supporting them need be not less so. . . . Whatever the unit used--minutes of time, an item of meaning, or a whole conversation--measures of the quantity of behavior emitted by one man are usually called measures of the frequency of interaction; that is measures of frequency of social behavior (Homans, 1961, p. 38).

The problem of what constitutes a unit has had a variety of interpretations. Bales and Stock and Thelan "defined the unit in terms of content, while others, such as Lerea and Goldberg, have dealt with interaction strictly in terms of units of utterance" (Wood, 1965, p. 18). The latter context of the above has been most relevant to the present investigation. These researchers utilized Charles C. Fries' definition of a unit as, "any stretch of speech by one person before which there was a silence on his part and after which there was also a silence on his part" (Lerea and Goldberg, 1961, pp. 60-61).

Regardless of the method of measurement, most researchers agree that interaction is positively related to sentiment. Based upon case studies he conducted, Homans generalized that, "If the frequency of interaction between two or more persons increases, the degree of their liking

for one another will increase, and vice versa" (Homans, 1950, p. 113).

Homans' ideas of the effects of interaction on group effectiveness were substantiated by Bass, who noted that a lack of interaction may result in failure to solve problems or in group effectiveness (Wood, 1965, p. 20-21). Bass' rationale was:

Since members tend to change toward more rewarding or effective behavior and since such change is most likely to result from interaction, it follows that the amount of interaction is positively associated with effectiveness (Bass, 1960, p. 372).

Empirical data Related to Sentiment and Interaction.

Within the framework presented by Homans, i. e. a mutual dependence exists between sentiment and interaction, Wood (1965) and Wheatley (1966) cited a number of investigations which indicate that relationship. Bovard (1965) noted a dramatic increase in interpersonal liking in his honor classes when interaction increased. Kipnis (1957) observed and recorded that functional and physical closeness, which lead to increased interaction, were related to interpersonal liking in a positive manner. Turner (1957) found that low interaction rates were associated with unliked foremen and high interaction rates were associated with liked foremen. Dittes and Kelley (1956) reported that group members who received bogus low-acceptability ratings decreased the number of interactions that they initiated (Wood, 1965, p. 20 and Wheatley, 1966, pp. 24-25).

As was noted earlier, Wheatley (1966) found sentiment and interaction to be related, though not statistically significant in proportion, between conditions of silent, non-participatory--non-supervisory leaders and leaderless (absent) exposures in problem-solving group discussions.

Object of the Study

Leadership and stress have been major phenomena of concern in the research of small groups. Countless investigations have recorded the traits and characteristics of leaders, leadership roles, and the qualities of emergent leadership where none existed before. Many varieties of stress have been imposed on subjects in attempts to test the human response. The researcher, the theorist, and the layman have many alternatives from which to choose as they function in small group discussions. Unfortunately, though, past research has largely overlooked the specific effects the mere presence of a leader and moderate stress has on a group, especially in relation to the sentiments and the interactions of the group members.

The teacher, the business manager, and the small group researcher are all faced with the problem of eliciting the maximum participation from group members, and what they must do to achieve it. This investigation was designed to fill the gap in recorded research, and to provide some tentative answers and explanations to the problems of the effects

leader presence and moderate stress have on sentiment and interaction in small, problem-solving groups.

Specific Objectives

This experiment sought to compare the silent leader-imposed stress, and silent leader-no stress, the absent leader-imposed stress, and the absent leader-no stress technique. Four experimental conditions were created that were held to be experimentally analogous to four problem-solving situations. The primary behavioral function of the silent leader was to refrain from any verbal interaction with the group. The absent leader was replicated by the absence of the assigned leader from the group discussion. Other functions of these experimental styles of leadership have been summarized in Appendixes A and B. The imposition of stress was simulated through the use of an audio tape-recording expressing time remaining in the group discussion. No stress was simulated by the absence of the recording. Discussion effectiveness was measured by group sentiment and interaction.

Hypotheses

For purposes of the investigation, the theoretical position of the advocates of the absent leader approach and the advocates of the imposition of stress were given the weight of probability. This resulted from the past research of Wood (1965) and Wheatley (1966), indicating that when the

perceived leader is absent, group members will respond more freely; and from the research of Lanzetta (1952); and Selye (1955), indicating that the imposition of stress will result in low sentiment, but high interaction among group members. The following, then, are the hypotheses of the investigation.

(1) Subjects receiving the Absent leader-No Stress exposure will rate highest in sentiment.

(2) Subjects receiving the Absent leader-Stress and subjects receiving the Silent leader-No Stress exposures will rate equally in sentiment.

(3) Subjects receiving the Silent leader-Stress exposure will rate lowest in sentiment.

(4) Subjects receiving the Absent leader-Stress exposure will rate highest in interaction.

(5) Subjects receiving the Silent leader-Stress and subjects receiving the Absent leader-No Stress exposures will rate equally in interaction.

(6) Subjects receiving the Silent leader-No Stress exposure will rate lowest in interaction.

Definition of Terms

In this study, the term effects referred to differences between various experimental groups in sentiment and interaction as measured by a post-session questionnaire, and interaction observation.

Sentiment was defined as the subject's feelings toward his group, its activities, and members, as reflected in his responses to scaled questionnaire items.

Interaction was defined as uninterrupted, verbal utterances as recorded by trained interaction observers.

Assumptions

Several assumptions were made in the investigation. They primarily concerned the design and the population of the study. It was assumed:

(1) That the silent leader condition was analogous to accepted leadership theories on non-participatory--no-supervisory leader designs.

(2) That the absent leader condition was analogous to accepted leadership theory on leaderless designs.

(3) That the imposition of the stress condition was analogous to accepted theory on stress design.

(4) That beginning speech students at Eastern Illinois University were experimentally analogous to individuals in the real small groups who were exposed to leader presence and stress.

(5) That twenty-minute sessions amply allowed the independent variables (leader presence and stress) to operate within the small group framework.

Summary

Research on leadership has concerned itself primarily around the traits and qualities of overt leadership or emergent leadership in the functioning of small groups. Research on stress has centered mostly around the responses of the recipients on the individual level and on the group level. However, the effects of leader presence coupled with moderate stress have received little attention. Therefore, this investigation was designed to compare the effects of two distinct styles of leadership and moderate stress upon the sentiment and interaction in a small, problem-solving group.

CHAPTER II

METHOD

Preliminaries

Selection of Subjects

Seventy-four students enrolled in the required speech course at Eastern Illinois University served as subjects in this investigation. The subjects were asked to volunteer for a thirty-five minute discussion session. The volunteers were informed that the discussions were in connection with a project of the speech department to aid in curriculum development. At no time prior to the investigation were the subjects informed of the real nature of the sessions or the real reasons behind them.

Size of Groups

Sixteen groups were formed by the random assignment of five members to each group. Groups, in turn, were randomly assigned to the four experimental conditions. Although group assignments were made on the basis of five members per group, six of the original volunteers failed to appear at their appointed time. The resultant sixteen groups had a mean size of 4.6 and a median size of four members. Four groups with a total of eighteen subjects were exposed to the silent leader-stress condition. Four groups with a total of nineteen subjects were exposed to the silent leader-

no stress condition. The absent leader-stress condition received eighteen subjects in four groups. Finally, four groups with a total of nineteen subjects received the absent leader-no stress exposure.

Independent Variables

The strategy of the investigation was to manipulate the style of leadership and the imposition of stress while attempting to maintain all other variables constant. One set of groups received the silent leader-stress exposure while another set of groups received the silent leader-no stress exposure. Still a third set of groups received the absent leader-stress exposure while a final set of groups received the absent leader-no stress condition. Consequently, the three most important areas of control were personnel, styles of leadership, and imposition of stress.

Personnel. For the two styles of leadership behavior required, two leaders were selected on the basis of knowledge of group dynamics, prior experience with leadership in small groups, and understanding of the research design. Both of the leaders were members of the faculty at Eastern Illinois University. In addition, the two had numerous hours and experience in group dynamics.

The investigator met with the two leaders one day prior to the experiment to furnish them detailed instructions, outline the procedure and duties of each, and answer questions relevant to the investigation. Each leader fulfilled the

silent leader and the absent leader duties, and imposed the stress and refrained from imposing the stress in equal numbers of groups. The leaders were assigned in a manner that would alternate the style of leadership each time, and the imposition of stress on each repetition of leadership style.

Two graduate students at Eastern Illinois University were selected to act as interaction observers. Both observers had prior knowledge of group dynamics, and were trained to observe using the framework outlined by Lerea and Goldberg (1961), and validated by Wood (1965) and Wheatley (1966).

Styles of Leadership. Following the research of Wheatley (1966), analagous experimental styles of leadership were developed for the investigation. Standardized behavior of leaders in each experimental condition was achieved through the use of an outline of the various approaches which each leader followed. Attempting to approach reality, leaders were instructed to deliver the instructions to the groups in a conversational manner. Each observer was furnished a copy of the instructions and asked to report any discrepancies or failures of the leaders to follow the outlined functions of each experimental condition. The observers reported no discrepancies or failures.

The outlines of accepted modes of behavior for each experimental exposure were as follows:

Silent leader-Stress [Appendix A]

- (1) Present during all phases of the group discussion.
- (2) Provides instructions at the beginning of each session. (Outlined in your comments on page two.)
- (3) Begins the imposition of stress.
- (4) Remains silent throughout the problem-solving discussion.
 - (A) Answers no questions asked by the subjects.
 - (B) Offers no suggestions pertaining to any phase of the discussion.
- (5) Collects task solutions of the group discussion at the end of the time limit.
- (6) Leaves the experimental room immediately after collecting the solutions.

Silent leader-No stress [Appendix B]

- (1) Present during all phases of the group discussion.
- (2) Provides instructions at the beginning of each session. (Outlined in your comments on page two.)
- (3) Remains silent throughout the problem-solving discussion.
 - (A) Answers no questions asked by the subjects.
 - (B) Offers no suggestions pertaining to any phase of the discussion.
- (4) Collects task solutions of the group discussion at the end of the time limit.
- (5) Leaves the experimental room immediately after

collecting the solutions.

Absent leader-Stress [Appendix C]

- (1) Present only at the beginning and end of the group discussion.
- (2) Provides instructions at the beginning of each session. (Outlined in your comments on page two.)
- (3) Begins the imposition of stress.
- (4) Leaves the experimental room immediately following the conclusion of instruction and imposition of stress.
- (5) Returns to the experimental room at the end of the session and collects the task solutions of the group discussion.
- (6) Leaves the experimental room immediately following the collection of the solutions.

Absent leader-No stress [Appendix D]

- (1) Present only at the beginning and end of the group discussion.
- (2) Provides instructions at the beginning of each session. (Outlined in your comments on page two.)
- (3) Leaves the experimental room immediately following the conclusion of instruction.
- (4) Returns to the experimental room at the end of the session and collects the task solutions of the group discussion.
- (5) Leaves the experimental room immediately following the collection of the solution.

In order to isolate the effects of leader presence to the problem-solving session only, the experimenter entered the experiment room immediately after the leader had left for the last time, and distributed and collected the measuring instrument. [Appendix M]

Imposition of Stress. Following the research of Lanzetta (1952), analogous experimental atmospheres of moderate stress were developed for the experiment. In order to standardize the imposition of the variable, an audio tape recording, using a voice unknown to all subjects, was made. The recording announced the remaining time left in the session at five minute intervals, until five minutes remained, at which time it marked each remaining minute. During the time between announcements the recorder was completely silent, though running. Subjects were advised in their instructions that the group discussion was not being recorded.

The imposition of the stress was facilitated by simply having the leader push the "play" button on the recorder immediately after presenting the instructions to the group. Standardization of behavior during the imposition of the recording was achieved by a rehearsal one day prior to the experiment in which the movement, expression, etc. of each leader was conditioned to be non-committal. Interaction observers did not report any discrepancies in prescribed leader behavior concerning the imposition of stress.

The Experiment

Design of the Experiment

Sixteen groups, ranging in size from four to five members, were assigned to four experimental conditions. The two leaders were assigned equally to each of the four exposures of leadership-stress. Of the two, one leader led thirty-eight subjects while the other leader led thirty-six subjects.

All of the groups were exposed to twenty minutes of problem-solving discussion with the leader initiating the appropriate combination of leadership and stress. The groups were given identical instructions (except the time limit, when applicable) (Appendixes H, and I), appropriate comments concerning leadership (Appendixes F, and G), and all attempted to solve the same set of deductive thought problems (Appendix J). Consequently, the independent variable(s) was introduced to all groups at the same time. During the problem-solving discussion, the subjects were requested to write their solutions to the problems on an answer sheet provided for each group (Appendix K).

After the leader had left the room for the final time, the investigator entered the experimental room and asked the subjects to remain for ten minutes to complete the anonymous post-session questionnaire (Appendix M).

Setting for the Experiment

The experiment was conducted on four days during the same hours of the afternoon. Sessions were conducted in two university classrooms in the same building. Each session was scheduled for a one-hour time period, although the actual experiment required approximately thirty-five minutes.

Standardization of the physical setting was accomplished according to the interaction observation chart (Appendix L). When the leader was assigned to be present (silent), a chair was provided for him, and the appropriate number of chairs for the participants were arranged in a circle. When appropriate, a table just outside the group area was provided for the recorder containing the stress variable. One interaction observer was placed behind a one-way glass partition, out of sight and sound of the group. The other interaction observer viewed the group through closed-circuit television equipment, permanently installed in the classroom. Subjects did not know they were being observed by the interaction observer. It should be noted at this point that although two different methods of viewing the group interaction were used, no discrepancies could be found on the part of either method to suggest it was less effective. Each method produced quite comparable results.

Procedure for the Experiment

After the leader had served his initial function(s), all groups discussed the set of deductive thought problems

for twenty minutes. At the end of the time period the groups were interrupted by the leader, who gathered the solution sheets and left the room. The investigator entered and asked the subjects to complete the anonymous post-session questionnaire. Once all of the participants had completed and returned the instrument, the investigator excused them, mentioning that they should not discuss the session with anyone.

Schedule

The schedule for the investigation is reported in Table I.

TABLE I
SCHEDULE FOR THE EXPERIMENT

Introduction and Instructions	Silent-Stress	5 min.
	Silent-No Stress	
	Absent-Stress	
	Absent-No Stress	
Discussion of Problems	Silent-Stress	20 min.
	Silent-No Stress	
	Absent-Stress	
	Absent-No Stress	
Questionnaire	Silent-Stress	10 min.
	Silent-No Stress	
	Absent-Stress	
	Absent-No Stress	

Collection of Data

Methods of Collection of the Data

Two methods were used in securing data in the investigation: subjects' reported feelings and direct observation. The reported feelings method was in the form of a post-session questionnaire, and interaction observers performed the direct observation method.

Post-session questionnaire. A twelve item post-session questionnaire was designed, following the method utilized by Wheatley (1966), to question the participants about their feelings and observations concerning the group experience. The twelve items were phrased as questions (Appendix M).

Under eleven of the questions was a five point scale, allowing for a continuum of response with two negative, one neutral, and two positive statements delineating scale intervals. A final question allowed for a simple five way breakdown of response (Wheatley, 1966, p. 49).

Interaction observation. Following an approach similar to that used by Wood (1965) and Wheatley (1966), the investigator followed the procedure outlined by Homans (1961) and utilized by Lerea and Goldberg (1961). Consequently, an interaction was defined as any uninterrupted utterance. An interaction observer counted the number of utterances by participants in each group (Wheatley, 1966, pp. 49-50).

Treatment of the Data

Refinement

After all raw data had been collected, it was transformed into numerical scores adaptable to statistical manipulation for the testing of the hypotheses of the investigation. The scores of the post-session questionnaire were determined by assigning numerical values from one to five along each continuum. Interaction data were transformed by counting the number of interactions per participant during the twenty-minute problem-solving discussion.

Statistical Treatment of the Data

Scores on the post-session questionnaire and the interaction observation chart were converted to means under each condition. A 2 x 2 analysis of variance to test for interaction was then utilized to analyze the differences between the means (Appendix N).

Summary

Seventy-four students enrolled in the required speech course at Eastern Illinois University were randomly assigned to four experimental conditions. The result was a yield of sixteen groups with four groups being exposed to each experimental condition. Two leaders, evenly assigned to the various conditions, introduced the styles of leadership and stress, where applicable, on four afternoons. At the end of a twenty minute problem-solving discussion, each subject completed an anonymous post-session questionnaire measuring group sentiment toward the experience. Interaction observers counted the number of uninterrupted utterances per subject during the twenty minute discussion period to provide interaction data. All data were converted to numerical scores and subjected to tests of significance to determine if significant differences existed between the mean responses to all items.

The effects of leader presence and moderate stress were measured in terms of group sentiment and interaction. The data gathering devices included a post-session questionnaire, and interaction observation.

CHAPTER III

RESULTS

Data were collected concerning the effects of leader presence and moderate stress upon small group sentiment and interaction. Sentiment information was gathered by means of a post-session questionnaire. Interaction was measured by trained observers counting the utterances of all group participants. The chapter, then, presents an analysis of the data collected, and a summary of the results.

Leader Presence-Stress and Sentiment

Questions on the post-session questionnaire used in this study paralleled those presented by Wood (1965) and utilized by Wheatley (1966). In his research, Wood noted that sentiment data were provided by questions one to ten and question fourteen, analogous to questions one to eleven in this study. Wood stated that those questions:

. . . dealt with understanding, acceptance, willingness to help the group attain its goals, competition, atmosphere, willingness to return for further sessions, meaningfulness of the workshop, and ability of the group to solve its problems. This information provided insights into group morale, into the subjects' feelings about other participants, and into the subjects' feelings about the group as a whole (Wood, 1965, p. 48).

Question number one was designed to demonstrate the extent to which subjects felt understood by their fellow group members. Gordon noted the importance of a feeling of

understanding in the development and productivity of a group (Gordon, 1955, p. 257). The results of the statistical analysis, a 2 X 2 factorial design, of subject response to question one are reported in Table II.

TABLE II

ANALYSIS OF DIFFERENCES BETWEEN CONDITIONS
IN RESPONSE TO QUESTIONNAIRE ITEM ONE

Question: "To what extent did you feel understood by your fellow group members?"

not at all	very little	somewhat	a lot	completely
	SILENT- STRESS	SILENT- NO STRESS	ABSENT- STRESS	ABSENT NO STRESS
MEAN	3.28	3.47	3.66	3.79
N	18	19	18	19

Analysis of Variance

Source of Variation	SS	df	MS	F	P
TOTAL VARIANCE	46.28	73.00			
Leader	2.28	1.00	2.28	3.67	n. s.
Stress	0.47	1.00	0.47	0.75	n. s.
Leader X Stress	0.02	1.00	0.02	0.04	n. s.
Error	43.51	70.00	0.62		

The mean responses of subjects to question one indicate that the degree to which they felt understood by

their fellow group members was between "somewhat" and "a lot" in all four conditions. However, the analysis of variance revealed no significant differences between the four conditions.

Based upon the data revealed by his research, Wood noted that, "Item two, which dealt with acceptance, closely parallels item one, which dealt with understanding" (Wood, 1965, p. 50). The results of question two are summarized in Table III.

TABLE III

ANALYSIS OF DIFFERENCES BETWEEN CONDITIONS
IN RESPONSE TO QUESTIONNAIRE ITEM TWO

Question: "To what extent did you feel accepted by the group?"

	not at all	very little	somewhat	a lot	completely
	SILENT- STRESS	SILENT- NO STRESS	ABSENT- STRESS	ABSENT- NO STRESS	
MEAN	3.72	4.10	4.11	4.10	
N	18	19	18	19	

TABLE III (Continued)

Analysis of Variance					
Source of Variation	SS	df	MS	F	P
TOTAL VARIANCE	54.99	73.00			
Leader	0.66	1.00	0.66	0.88	n. s.
Stress	0.66	1.00	0.66	0.87	n. s.
Leader X Stress	0.70	1.00	0.70	0.92	n. s.
Error	52.97	70.00	0.76		

The mean responses to questionnaire item two reveal that subjects in all four experimental conditions felt accepted by their groups at a level near "a lot." The analysis of variance indicated, however, that there were no significant differences between the responses in the four experimental exposures.

Smith and Weston (1951) indicated that willingness of group members to help attain group goals is an important aspect of sentiment. Questions three and four sought to determine the willingness of the subjects to contribute to group goals and how they perceived the willingness of other members to contribute to group goals. The results of the statistical analyses of questions three and four are outlined in Table IV and Table V.

TABLE IV

ANALYSIS OF DIFFERENCES BETWEEN CONDITIONS
IN RESPONSE TO QUESTIONNAIRE ITEM THREE

Question: "Were you willing to help the group attain its goals?"

not at all	very little	somewhat	a lot	completely
	SILENT- STRESS	SILENT- NO STRESS	ABSENT- STRESS	ABSENT- NO STRESS
MEAN	3.77	4.31	4.22	4.58
N	18	19	18	19

Analysis of Variance

Source of Variation	SS	df	MS	F	P
TOTAL VARIANCE	70.12	73.00			
Leader	3.04	1.00	3.04	3.33	n. s.
Stress	2.84	1.00	2.84	3.11	n. s.
Leader X Stress	0.39	1.00	0.39	0.43	n. s.
Er Error	63.85	70.00	0.91		

TABLE V

ANALYSIS OF DIFFERENCES BETWEEN CONDITIONS
IN RESPONSE TO QUESTIONNAIRE ITEM FOUR

Question: "Did the other group members seem willing to help the group attain its goals?"

	not at all	very little	somewhat	a lot	completely
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TABLE V (Continued)

	SILENT- STRESS	SILENT- NO STRESS	ABSENT- STRESS	ABSENT- NO STRESS
MEAN	4.00	4.52	4.50	4.37
N	18	19	18	19

Analysis of Variance					
Source of Variation	SS	df	MS	F	P
TOTAL VARIANCE	48.86	73.00			
Leader	0.49	1.00	0.49	0.75	n. s.
Stress	0.72	1.00	0.72	1.10	n. s.
Leader X Stress	2.00	1.00	2.00	3.07	n. s.
Error	45.66	70.00	0.65		

An examination of the mean responses to questionnaire item three indicated that the subjects in all four experimental conditions expressed a willingness to help the group attain its goals between "a lot" and "completely." However, the analysis of variance indicated no significant difference between the mean responses of the four experimental conditions.

An examination of the mean responses to questionnaire item four indicated that the subjects felt other members seemed willing to help the group attain its goals between "a lot" and "completely" in all four experimental conditions. Again, however, analysis of variance, as in the case with questionnaire item three, failed to note any significant

differences between the mean responses to questionnaire item four.

Questions five and six of the post-session questionnaire were related to the level of competition exhibited by the subjects under each experimental exposure. Similar to items three and four, these questions asked subjects to report how much they were competing with other group members and how much they felt other group members were competing with them. Wood indicated the importance of competition in the small group by stating, "The level of competition can be very important in a training group because research has indicated that members in competing groups have a tendency to withhold information from each other while participants in non-competing groups seem to communicate more freely and learn more" (Wood, 1965, p. 58). Statistical analyses of the responses of the subjects to items five and six of the post-session questionnaire are reported in Table VI and Table VII.

TABLE VI

ANALYSIS OF DIFFERENCES BETWEEN CONDITIONS
IN RESPONSE TO QUESTIONNAIRE ITEM FIVE

Question: "To what extent did you feel you were competing with other group members?"

not at all	very little	somewhat	a lot	completely
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TABLE VI (Continued)

	SILENT SILENT- STRESS	SILENT- NO STRESS	ABSENT- STRESS	ABSENT- NO STRESS
MEAN	2.16	2.21	2.22	1.84
N	18	19	18	19

Analysis of Variance

Source of Variation	SS	df	MS	F	P
TOTAL VARIANCE	57.14	73.00			
Leader	0.49	1.00	0.49	0.62	n. s.
Stress	0.52	1.00	0.52	0.66	n. s.
Leader X Stress	0.83	1.00	0.83	1.05	n. s.
Error	55.30	70.00	0.79		

TABLE VII

ANALYSIS OF DIFFERENCES BETWEEN CONDITIONS
IN RESPONSE TO QUESTIONNAIRE ITEM SIX

Question: "To what extent did you feel other group members were competing with you?"

not at all	very little	somewhat	a lot	completely
	SILENT- STRESS	SILENT- NO STRESS	ABSENT- STRESS	ABSENT- NO STRESS
MEAN	2.11	2.37	2.22	1.89
N	18	19	18	19

TABLE VII (Continued)

Analysis of Variance					
Source of Variation	SS	df	MS	F	P
TOTAL VARIANCE	75.36	73.00			
Leader	0.66	1.00	0.66	0.63	n. s.
Stress	0.02	1.00	0.02	0.02	n. s.
Leader X Stress	1.58	1.00	1.58	1.51	n. s.
Error	73.10	70.00	1.04		

The mean responses to questionnaire item five revealed that the subjects in all four experimental conditions clustered their ratings around the "very little" level in terms of competition with other group members. The analysis of variance revealed no significant differences between the four conditions.

An investigation of the mean responses to item six indicated results similar to those of item five. In their response to item six, subjects again tended to cluster around the "very little" dimension in terms of how they perceived other group members competing with them. The statistical analysis of responses to item six demonstrated that the differences between the four experimental conditions were not significant.

The importance of atmosphere in the cohesiveness of a group was indicated through the research of Pepitone and Reichling (1955). Consequently, questionnaire item seven

was developed in an attempt to determine the atmosphere of each group along a "hostile" to "very friendly" continuum. The analysis of the responses to questionnaire item seven is summarized in Table VIII.

TABLE VIII

ANALYSIS OF DIFFERENCES BETWEEN CONDITIONS
IN RESPONSE TO QUESTIONNAIRE ITEM SEVEN

Question: "How would you characterize the 'atmosphere' in your group?"					
hostile	apathetic	neutral	pleasant	very friendly	
	SILENT- STRESS	SILENT- NO STRESS	ABSENT- STRESS	ABSENT- NO STRESS	
MEAN	4.16	4.31	4.22	4.42	
N	18	19	18	19	
Analysis of Variance					
Source of Variation	SS	df	MS	F	P
TOTAL VARIANCE	41.04	73.00			
Leader	0.12	1.00	0.12	0.21	n. s.
Stress	0.56	1.00	0.56	0.97	n. s.
Leader X Stress	0.01	1.00	0.01	0.02	n. s.
Error	40.35	70.00	0.58		

The atmosphere in the groups, as indicated by an examination of the mean responses to questionnaire item

seven, was rated slightly higher than "pleasant" in all four experimental conditions. No significant differences, though, were shown to exist between the mean responses when the data were subjected to analysis of variance.

The purpose of questionnaire item eight was to ascertain the meaningfulness of the session for the subjects. Bass noted that a meaningful experience in a group will result in positive feelings toward the group (Bass, 1960, pp. 61-64). Table IX summarizes the results of the analysis of responses to questionnaire item eight.

TABLE IX

ANALYSIS OF DIFFERENCES BETWEEN CONDITIONS
IN RESPONSE TO QUESTIONNAIRE ITEM EIGHT

Question: "Was the session meaningful to you?"

not at all	very little	somewhat	a lot	completely
	SILENT- STRESS	SILENT- NO STRESS	ABSENT- STRESS	ABSENT- NO STRESS
MEAN	3.28	3.00	2.83	3.31
N	18	19	18	18

TABLE IX (Continued)

Analysis of Variance					
Source of Variation	SS	df	MS	F	P
TOTAL VARIANCE	75.14	73.00			
Leader	0.05	1.00	0.05	0.05	n. s.
Stress	0.19	1.00	0.19	0.19	n. s.
Leader X Stress	2.67	1.00	2.67	2.59	n. s.
Error	72.22	70.00	1.03		

The mean responses of the participants in all four of the experimental conditions clustered their ratings around the "somewhat" dimension of the continuum concerning the meaningfulness of the session. The analysis of variance, though, revealed that the differences in mean responses to this question were not statistically significant.

Bass has stated that a willingness to return to the group is an indicator of group attractiveness (Bass, 1960, p. 62). In light of this, item nine of the post-session questionnaire sought to determine if subjects would return for further sessions with the same group if each of the subjects had time. The results of question number nine are reported in Table X.

TABLE X

ANALYSIS OF DIFFERENCES BETWEEN CONDITIONS
IN RESPONSE TO QUESTIONNAIRE ITEM NINE

Question: "Frankly, if you had time, would you like to return to further sessions with the same group?"

_____ definitely would return

_____ strong desire to return

_____ feel neutral about it

_____ fairly strong desire not to return

_____ definitely do not want to return

	SILENT- STRESS	SILENT- NO STRESS	ABSENT- STRESS	ABSENT- NO STRESS
MEAN	2.27	1.84	2.44	1.95
N	18	19	18	19

Analysis of Variance

Source of Variation	SS	df	MS	F	P
TOTAL VARIANCE	60.05	73.00			
Leader	0.05	1.00	0.05	0.07	n. s.
Stress	2.77	1.00	2.77	3.41	n. s.
Leader X Stress	0.22	1.00	0.22	0.27	n. s.
Error	57.00	70.00	0.81		

The mean responses of the participants clustered around the "strong desire to return" in all of the experimental conditions. Again, the analysis of variance revealed

no statistical significance between the mean responses in the four conditions.

Based upon research by Bass, which indicated that willingness to change groups is an index of group attractiveness (Bass, 1960, p. 62), item ten of the post-session questionnaire sought to ascertain the feelings of subjects about whether or not they would have gained more from the session had they been in another group. Table XI provides a summary of the analysis of the mean responses to item ten or the post-session questionnaire.

TABLE XI

ANALYSIS OF DIFFERENCES BETWEEN CONDITIONS
IN RESPONSE TO QUESTIONNAIRE ITEM TEN

Question: "Do you feel you would have gained more from the session in another group?"

	not at all	very little	somewhat	a lot	completely
	SILENT- STRESS	SILENT- NO STRESS	ABSENT- STRESS	ABSENT- NO STRESS	
MEAN	2.22	1.58	1.77	1.63	
N	18	19	18	19	

TABLE XI (Continued)

Analysis of Variance					
Source of Variation	SS	df	MS	F	P
TOTAL VARIANCE	53.96	73.00			
Leader	0.66	1.00	0.66	0.94	n. s.
Stress	2.88	1.00	2.88	4.09	p = .05
Leader X Stress	1.14	1.00	1.14	1.62	n. s.
Error	49.27	70.00	0.70		

An examination of the mean responses of subjects in the Silent leader-Stress condition revealed that they felt they would have gained "very little" from the session in another group. Conversely, the mean responses of all other experimental conditions expressed a feeling between the "not at all" and "very little" dimensions in terms of possible gain as participants in other groups.

The differences between mean responses to questionnaire item ten proved to be statistically significant, when stress was imposed.

Questionnaire item eleven was designed to determine the level of morale present in the four experimental conditions. Consequently, pursuing the suggestions of Collins and Guetzkow (1964), this item requests subjects to rate their group's ability to solve its problems. Additionally, questionnaire item twelve sought to determine the level of morale in terms of their feelings about the quality of the

solutions reached by their group. The results of the analysis of items eleven and twelve are summarized in Table XII and Table XIII.

TABLE XII

ANALYSIS OF DIFFERENCES BETWEEN CONDITIONS
IN RESPONSE TO QUESTIONNAIRE ITEM ELEVEN

Question: "How would you rate your group's ability to solve its problems?"				
poor	fair	average	excellent	superior
	SILENT-STRESS	SILENT-NO STRESS	ABSENT-STRESS	ABSENT-NO STRESS
MEAN	3.00	2.63	2.66	3.10
N	18	19	18	19

Analysis of Variance					
Source of Variation	SS	df	MS	F	P
TOTAL VARIANCE	38.66	73.00			
Leader	0.01	1.00	0.01	0.03	n. s.
Stress	0.36	1.00	0.36	0.67	n. s.
Leader X Stress	1.10	1.00	1.10	2.07	n. s.
Error	37.19	70.00	0.53		

TABLE XIII

ANALYSIS OF DIFFERENCES BETWEEN CONDITIONS
IN RESPONSE TO QUESTIONNAIRE ITEM TWELVE

Question: "How would you rate the quality of the solutions reached by your group?"

poor	fair	average	excellent	superior
	SILENT- STRESS	SILENT- NO STRESS	ABSENT- STRESS	ABSENT- NO STRESS
MEAN	3.17	3.21	3.22	3.53
N	18	19	18	19

Analysis of Variance

Source of Variation	SS	df	MS	F	P
TOTAL VARIANCE	52.59	73.00			
Leader	0.86	1.00	0.86	1.19	n. s.
Stress	0.75	1.00	0.75	1.04	n. s.
Leader X Stress	0.19	1.00	0.19	0.27	n. s.
Error	50.78	70.00	0.73		

Table XII reveals that all four experimental conditions specified the various groups' abilities to solve their problems around the "excellent" dimensions. The analysis of variance revealed that the mean differences of the various conditions were not statistically significant.

An examination of the mean responses of subjects to post-session questionnaire item twelve revealed that

participants clustered their ratings between "average" and "excellent" dimensions on the continuum. The analysis of variance indicates, though, that there is no statistical significance between the four experimental conditions.

Summary of Sentiment Results

Post-session questionnaire items one through twelve were designed to test three hypotheses of the investigation:

- (1) Subjects receiving the absent leader-no stress exposure will rate highest in sentiment.
- (2) Subjects receiving the absent leader-stress and subjects receiving the silent leader-no stress exposures will rate equally in sentiment.
- (3) Subjects receiving the silent leader-stress exposure will rate lowest in sentiment.

No significant differences were revealed between the experimental conditions in terms of participants' feeling accepted in their groups; being understood by their groups; willingness of subjects to help determine group goals and perception of other members' willingness; the subjects' feeling of competitiveness in the group; the atmosphere of the group; the meaningfulness of the session to the participants; willingness of subjects to return to their groups at another time; and the morale of the groups exposed to the various conditions.

However, from the standpoint of the individual's

feelings about whether he could have gained more from the session in another group, the imposition of stress produced a significant effect. In the condition where both the present leader and stress were introduced, subjects indicated that they could have gained relatively more in a session with another group.

Leader Presence-Stress and Interaction

The collection of interaction data was accomplished by the direct observation of the experimental conditions by two trained interaction observers. The observers counted the number of utterances made by each participant during the twenty minute problem-solving discussion. The utterances per subject were then tallied, the means of the group determined, and the means treated statistically to determine if there were non-chance differences between the four experimental conditions.

Whether significant differences existed between mean interaction levels in the four experimental exposures was accomplished through analysis of variance. Hypotheses were tested by determining the significance of the difference between the means of the various conditions. Additional analysis of variance between two groups was used to ascertain the specific differences.

A summary of the interaction data obtained by the observers is provided in Table XIV.

TABLE XIV

ANALYSIS OF DIFFERENCES BETWEEN CONDITIONS IN
INTERACTION DURING TWENTY MINUTE DISCUSSION

	ABSENT- STRESS	SILENT- STRESS	ABSENT- NO STRESS	SILENT- NO STRESS
MEAN	71.56	47.39	43.79	33.58
N	18	18	19	19

Analysis of Variance

Source of Variation	df	Mean Square	F	Significance
Between conditions	3	4743.79	10.95	p = .001
Within conditions	70	433.22		1% level

Difference between Absent-Stress and Silent-Stress

Source of Variation	df	Mean Square	F	Significance
Between conditions	1	5279.04	13.19	p = .001
Within conditions	34	400.28		1% level

Difference between Absent-Stress and Absent-No Stress

Source of Variation	df	Mean Square	F	Significance
Between conditions	1	7126.85	13.87	p = .001
Within conditions	35	513.70		1% level

Difference between Absent-Stress and silent-No Stress

Source of variation	df	Mean Square	F	Significance
Between conditions	1	13359.32	37.67	p = .001
Within conditions	35	354.69		1% level

TABLE XIV (Continued)

<u>Difference between Silent-Stress and Absent-No Stress</u>				
<u>Source of Variation</u>	<u>df</u>	<u>Mean Square</u>	<u>F</u>	<u>Significance</u>
Between conditions	1	124.29	124	$p \neq .05$
Within Conditions	35	511.74		n. s.

<u>Difference between Silent-Stress and Silent-No Stress</u>				
<u>Source of Variation</u>	<u>df</u>	<u>Mean Square</u>	<u>F</u>	<u>Significance</u>
Between conditions	1	1758.03	4.98	$p = .05$
Within conditions	35	352.73		5% level

<u>Difference between Silent-No Stress and Absent-No Stress</u>				
<u>Source of Variation</u>	<u>df</u>	<u>Mean Square</u>	<u>F</u>	<u>Significance</u>
Between conditions	1	993.32	2.14	$p \neq .05$
Within conditions	36	464.32		n. s.

Table XV provides a summary matrix of the interaction data.

TABLE XV

SUMMARY OF INTERACTION RESULTS

	ABSENT- STRESS	SILENT- STRESS	ABSENT- NO STRESS	SILENT- NO STRESS
MEAN	71.56	47.39	43.79	33.58
N	18	18	19	19

	ABSENT- STRESS	SILENT- STRESS	ABSENT- NO STRESS	SILENT- NO STRESS
SILENT- STRESS	13.19*	-----	n. s.	4.98**
ABSENT- NO STRESS	13.87*	n. s.	-----	n. s.
SILENT- NO STRESS	37.67*			

* = .001 degree of confidence.

** = .05 degree of confidence.

The data revealed that the mean interaction rate in the Absent leader-Stress experimental condition was over twice as high as the Silent leader-No Stress exposure, and markedly higher than the Silent leader-Stress, and the Absent leader-No Stress exposures. Additionally, the mean interaction rate of the Silent leader-Stress condition was notably higher than the Silent leader-No Stress exposure. The trend was not apparent in the comparison of the Silent leader-Stress and Absent leader-No Stress, and in the Silent leader-No Stress and Absent leader-No Stress

conditions.

The analysis of variance indicated that, statistically, differences between the means were highly significant. Further specific analysis revealed that the rate of interaction in the Absent leader-Stress condition was significantly higher in the twenty minute discussion than the Silent leader-Stress, the Absent leader-No Stress, and the Silent leader-No Stress conditions. Additionally, interaction in the Silent leader-Stress condition was found to be significantly higher than the interaction of the Silent leader-No Stress condition. No statistically significant results were discovered between the Silent leader-Stress and Absent leader-No Stress, or between the Silent leader-No Stress and Absent leader-No Stress exposures.

Summary of Interaction Results

The obtained interaction data recorded by the interaction observers were designed to test three hypotheses of the investigation:

- (1) Subjects receiving the Absent leader-Stress exposure will rate highest in interaction.
- (2) Subjects receiving the Silent leader-Stress and subjects receiving the Absent leader-No Stress will rate equally in interaction.
- (3) Subjects receiving the Silent leader-No Stress exposure will rate lowest in interaction.

The results of this investigation fully supported the first two hypotheses and partially supported the third hypothesis. Participants in the Absent leader-Stress condition rated highest in interaction to the one per cent level of confidence in relation to all three of the other conditions. No significant difference was found between the Silent leader-Stress and the Absent leader-No Stress exposures. Significance at the five per cent level of confidence was indicated between the Silent leader-Stress and the Silent leader-No Stress conditions. However, the results between the Absent leader-No Stress and the Silent leader-No Stress conditions were not statistically significant.

Through their research in small group interaction, both Wood (1965) and Wheatley (1966) noted that the presence of the leader tended to reduce the interaction of the group. Those conclusions were only partially supported in this investigation. Additionally, Lanzetta (1952) concluded that the imposition of stress similar to that used in this investigation affected an increase in the group interaction. Similar conclusions could be drawn from this investigation.

Summary of Results

Data obtained from the various experimental conditions were analyzed to determine the effects of leader presence and externally imposed stress upon small group sentiment and interaction. Data obtained from the post-

session questionnaire subjected to analysis of variance to determine differences in mean responses relating to sentiment. Secondly, data obtained by direct observation through the use of interaction observers were also treated by means of analysis of variance to determine whether significant differences existed between the experimental conditions in interaction.

The completed analyses indicated that little differences existed between conditions in terms of subjects' sentiment, but that highly significant differences existed in the relative group interactions. The differences existing between the various conditions on the variables of sentiment and interaction are summarized below.

Sentiment

Participants in all four experimental conditions seemed to rate equally in terms of sentiment. No significant differences were found between the experimental exposures in terms of participants' feeling accepted in their groups; being understood by their groups; willingness of subjects to help determine group goals and perception of other members' willingness; the subjects' feeling of competitiveness in the group; the atmosphere of the group; the meaningfulness of the session to the participants; willingness of subjects to return to their groups at another time; and the morale of the groups exposed to the various conditions. The only significant differences noted was in relation to whether

the subjects felt they could have gained more from the session in another group. At that point the imposition of stress produced a significant effect at the five per cent level of confidence.

Interaction

Participants in the Absent leader-Stress condition rated highest in interaction while participants in the Silent leader-No Stress condition rated lowest. Participants in the Absent leader-No Stress and the Silent leader-Stress conditions interacted equally. Highly significant differences were noted between the Absent leader-Stress condition and each of the other three conditions. Additionally, a significant difference was found between the interaction in the Silent leader-Stress and the Silent leader-No Stress conditions. No significant differences were found between the Silent leader-Stress and Absent leader-No Stress; or between the Absent leader-No Stress and Silent leader-No Stress conditions.

CHAPTER IV

CONCLUSION

Summary

The effectiveness of small group discussion has long been the concern of researchers and scholars. However, experimental research focusing on the inner-feelings of participants is scant. Little attention has been directed toward the effects leader presence and imposed stress have on the sentiment and interaction of participants in a group. This investigation was designed to experimentally compare the effects of leader presence and imposed moderate stress upon small, problem-solving group discussion, in terms of sentiment and interaction.

Seventy-four students enrolled at Eastern Illinois University constituted the subjects for the study. Sixteen groups of four to five members were assigned to four experimental conditions.

All groups worked for twenty-minutes on the solutions to a series of deductive thought problems. Each group also received the appropriate variables during discussion. Leader presence was introduced as an independent variable, as was externally imposed moderate stress, in a 2 X 2 factorial design. At the end of this period, the groups were asked to complete the post-session questionnaire.

In this particular investigation, sentiment and

interaction were selected as important keys to understanding the group process and effectiveness. The sentiment of the subjects was measured through their marking a post-session questionnaire which elicited information concerning their attitudes toward their group session and fellow group members. Interaction was measured by trained interaction observers who counted the number of utterances per member in each group.

Theoretical Implications

The experiment supplied information concerning six hypotheses that were formulated for purposes of the investigation. Certain specific implications of the study can be seen by considering the findings as they relate to the six hypotheses.

Hypothesis # 1: Subjects receiving the Absent leader-No Stress exposure will rate highest in sentiment.

Hypothesis # 2: Subjects receiving the Absent leader-Stress and subjects receiving the Silent leader-No Stress exposures will rate equally in sentiment.

Hypothesis # 3: Subjects receiving the Silent leader-Stress exposure will rate lowest in sentiment.

The results of this investigation approached but did not statistically support the above hypotheses. When conditions were compared on the basis of numerical score, the Absent leader-No Stress condition showed the highest

mean response; the Silent leader-No Stress condition revealed the second-highest mean response; the Absent leader-Stress condition showed the third-highest mean response; and, finally, the Silent leader-Stress condition rated lowest in sentiment mean response. However, the analysis of variance revealed that these scores were not significant.

Hypothesis # 4: Subjects receiving the Absent leader-Stress exposure will rate highest in interaction.

The findings of this investigation directly supported this hypothesis. Subjects in the Absent leader-Stress condition rated highest in interaction. Furthermore, these subjects more than doubled the interaction rate of the subjects in the Silent leader-No Stress condition, and were markedly higher than the interaction rates of subjects in the Silent leader-Stress and Absent leader-No Stress conditions. Statistical analysis indicated that when compared to the other three conditions, subjects in the Absent leader-Stress condition rated significantly higher in all comparisons to the one per cent level of confidence.

Hypothesis # 5: Subjects receiving the Silent leader-Stress and subjects receiving the Absent leader-No Stress exposures will rate equally in interaction.

This hypothesis was supported by the results of the experiment. Subjects in the Silent leader-Stress and the Absent leader-No Stress conditions had no statistically sig-

nificant variance between their rates of interaction. Numerically, these conditions ranked second and third in relation to the other conditions.

Hypothesis # 6: Subjects receiving the Silent leader-No Stress exposure will rate lowest in interaction.

Data obtained and analyzed in this investigation approached, but did not fully support this hypothesis. By numerical score, subjects in the Silent leader-No Stress condition produced the lowest mean interaction rate. Additionally, significance at the five per cent level of confidence was found between the interaction rate of subjects in the Silent leader-No Stress and the Silent leader-Stress conditions. However, the hypothesis was not supported due to the result that those subjects in the Silent leader-No Stress exposure did not rate significantly lower than subjects in the Absent leader-No Stress exposure.

Summary

The following conclusions were reached by an examination of the data:

(1) No significant differences in sentiment were found between the four conditions, although the numerical scores of the subjects in the Absent leader-No Stress condition seemed highest on this variable and subjects' scores in the Silent leader-Stress exposure seemed lowest.

(2) Subjects receiving the Absent leader-Stress exposure were highest in interaction.

(3) Subjects receiving the Silent leader-Stress and the Absent leader-No Stress exposures rated equally in interaction.

(4) Subjects in the Silent leader-No Stress condition rated lowest in interaction, but not significantly lower than the Absent leader-No Stress subjects.

Although it can only be inferred at the present time, the presence of a leader did not seem to have an appreciable effect upon the group sentiment, as suggested by previous researchers. Stress, also fell short in its impact upon group sentiment. Possible reasons behind the lack of sentiment effect by the two independent variables are four-fold. First, subjects may not have perceived the assigned leader as an actual leader. Second, subjects may not have perceived the stress variable as important or threatening. Third, the particular problems may have produced an uncontrolled effect on the attitudes of the participants which was not expected through preliminary research.

Responses to post-session questionnaire items eleven and twelve indicate that participants in all four experimental conditions had high opinions of their ability to solve the problems and the quality of the solutions reached. Finally, and fourth, although the group sentiment was generally better than neutral, subjects, on the whole, may have been apathetic toward the two imposed variables. However, stress did make an impact in terms of felt relevance

of the session.

Stress appeared to be the most demonstrative independent variable in the study. In terms of interaction, it appeared to have a more definite impact than did leader presence, although both clearly affected the groups. Evidence of this higher impact is shown in the comparison of the Silent leader-No Stress and the Absent leader-No Stress exposures. The results of that comparison proved insignificant and therefore suggests that leader presence did not carry its expected effect on the groups, while the conditions using imposed stress proved highly significant in all but one comparison.

Wood (1965) found that in his research, interaction was highest in those groups which had no leader (Wood, 1965, p. 116). Wheatley (1966) indicated that in his research the leaderless groups, analogous to the absent leader in this study, interacted notably higher than conditions where the leader was present, participated, and/or supervised in the group discussion (Wheatley, 1966, p. 111). Similarly, this investigation indicated a parallel conclusion, but only when stress was imposed along with the leader. Without the imposition of stress, leader presence made little difference on the group interaction.

Lanzetta (1952) noted a marked increase in group interaction in conditions where he imposed moderate stress (Lanzetta, 1952, pp. 156-157). This investigation found

similar results. Subjects in conditions where stress was imposed clearly exceeded their expected increase in interaction.

Practical Implications

Extreme caution should be exercised in generalizing from the results of a single experimental investigation. Many additional research investigations are needed to fully explore the possible effects of leader presence and/or moderate stress upon the inner-feelings and behavior of small group participants. Should future studies support the results of this investigation, the practical implications may be of value to leaders in the "natural" group setting.

The findings of this investigation suggest that the presence of a leader has no appreciable effect upon the sentiment of a group as revealed by the post-session questionnaire. The leader may remain or leave, depending on his or her interpretation of the situation facing the group, without being overly concerned about the level of sentiment within the group participants.

Another important implication of this investigation concerns the imposition of stress. In a "natural" group setting, the leader may choose to impose stress on the group to make them interact more, but without worry of affecting their sentiment responses to the situation.

Suggestions for Further Study

An examination of the findings of this investigation suggests at least two areas for future research. These areas could be summarized as:

- (1) Research concerning the measurement of the effectiveness of small group participants.
- (2) Research concerning "natural" group settings.

The Measurement of the Effectiveness of Small Group Participants

Although this investigation failed to note any significant differences in sentiment as a result of the introduction of leader presence and moderate stress, further research is needed to support or contradict these findings. The results of this investigation suggest a trend toward confirming the hypotheses. Further research, which more clearly isolates leader presence, is needed to clarify that trend. Other types of problems may create a more conducive situation in which to test leader presence and stress on group sentiment. Also, objective methods of measuring group activity--enabling that quality of group effectiveness to be included realistically in research--may also prove helpful in studying leader presence and stress.

Further research concerning group interaction should also be conducted. An investigator could readily combine the "utterance count" method, used in this study, and the

"content" method used by Bales and others, and thereby promote a more unified body of research of small group dynamics. The questions can be asked, "What causes the interaction levels of participants? Do they interact primarily because of some externally imposed source; an internal source; or a combination of the two? What effect, if any, do the levels of sentiment and activity have upon the rate and content of participants' interaction?"

"Natural" Setting Investigations

Both Wood (1965) and Wheatley (1966) noted that small group research should be conducted in "natural" groups. This study suggests a similar approach. If this method of research were transferred to groups formed in the "real" sense (and who were motivated by the promise of rewards or the threat of punishment, as is usually the case in the "real world"), would the members perceive the leader more definitely? Would this perception result in leader presence having a greater impact on the dynamics of the group? If the problems were also more "real," would this increase the effects of leader presence? Methods should be developed which would allow for these types of studies.

Similar suggestions can be made concerning the role stress plays in small group effectiveness, in terms of sentiment, interaction and activity. What would be the effects of stress upon a "natural" group attempting to solve

a "real" problem or reach a "real" decision? Data obtained from investigations such as these could provide those implicated in small group situations with knowledge and insight of the effectiveness of small groups, and how to elicit desired results from those groups.

APPENDIXES

APPENDIX A

FUNCTIONS

(Silent leader-Stress)

1. Present during all phases of the group discussion.
2. Provides instructions at the beginning of each session.
(Outlined in your comments on page two.)
3. Begins the imposition of stress.
4. Remains silent throughout the problem-solving discussion.
 - (a) Answers no questions asked by the subjects.
 - (b) Offers no suggestions pertaining to any phase of the discussion.
5. Collects task solutions of the group discussion at the end of the time limit.
6. Leaves the experimental room immediately after collecting the solutions.

(Note: The experimenter will enter the room, distribute and collect the measuring instrument after the leader has left the experimental room.)

APPENDIX B

FUNCTIONS

(Silent leader-No Stress)

1. Present during all phases of the group discussion.
2. Provides instructions at the beginning of each session.
(Outlined in your comments on page two.)
3. Remains silent throughout the problem-solving discussion.
 - (a) Answers no questions asked by the subjects.
 - (b) Offers no suggestions pertaining to any phase of the discussion.
4. Collects task solutions of the group discussion at the end of the time limit.
5. Leaves the experimental room immediately after collecting the solutions.

(Note: The experimenter will enter the room, distribute and collect the measuring instrument after the leader has left the experimental room.)

APPENDIX C

FUNCTIONS

(Absent leader-Stress)

1. Present only at the beginning and end of the group discussion.
2. Provides instructions at the beginning of each session. (Outlined in your comments on page two.)
3. Begins the imposition of stress.
4. Leaves the experimental room immediately following the conclusion of instruction and imposition of stress.
5. Returns to the experimental room at the end of the session and collects the task solutions of the group discussion.
6. Leaves the experimental room immediately following the collection of the solutions.

(Note: The experimenter will enter the room, distribute and collect the measuring instrument after the leader has left the experimental room for the second time.)

APPENDIX D

FUNCTIONS

(Absent leader-No Stress)

1. Present only at the beginning and end of the group discussion.
2. Provides instructions at the beginning of each session. (Outlined in your comments on page two.)
3. Leaves the experimental room immediately following the conclusion of instruction.
4. Returns to the experimental room at the end of the session and collects the task solutions of the group discussion.
5. Leaves the experimental room immediately following the collection of the solutions.

(Note: The experimenter will enter the room, distribute and collect the measuring instrument after the leader has left the experimental room for the second time.)

APPENDIX E

INTRODUCTION

(Please Read to Subjects)

Thank you for coming. You are undoubtedly wondering why you have been asked to report here this afternoon. Since problem-solving group discussions are playing an increasingly important role in society, Eastern Illinois University and the Department of Speech are interested in finding out just how the students of this school approach such tasks. Subsequently, cross-sections of the student population have been selected to participate in problem-solving group discussions. Your honest efforts here, today, will provide us with some valuable information with which we can study our own situation and possibly find new and better methods of teaching to meet the changing needs of our students.

Before you consider the problems you will discuss, let me briefly explain my reasons for being here this afternoon.

APPENDIX F

LEADERSHIP COMMENTS

(Silent)

(Please Read to Subjects)

I am a member of the faculty of the Department of Speech. As a member, also, of the Discussion Interest Group, I have been selected to serve as your leader during today's session. I hope that the administration and I will gain insights from your participation in today's discussion.

During the session I only want to observe your methods of solving the problems, and listen to your comments. Therefore, I will not actually take part in your discussion. Subsequently, I will not answer any questions you may have about the problems or provide suggestions for solutions.

In front of you, you will each find a booklet turned face-down. Turn it over now, but do not start reading it until I tell you to so. Here are your instructions concerning the discussion, listen carefully.

APPENDIX G

LEADERSHIP COMMENTS

(Absent)

(Please Read to Subjects)

I am a member of the faculty of the Department of Speech. As a member, also, of the Discussion Interest Group, I have been selected to serve as your leader during today's session. I hope that the administration and I will gain insights from your participation in today's discussion.

I will give you the problems for discussion and return later to pick up your results. Here are your instructions concerning the discussion, listen carefully.

APPENDIX H

INSTRUCTIONS FOR PROBLEMS

(Stress)

(Please Read to Subjects)

1. Your goal is to solve all of the following problems through group discussion. Consider each solution a group effort. Feel free to speak as often as you want.
2. There is one, and only one, correct set of answers to each problem.
3. The solutions to the problems must have the consensus of the group (i.e. all members of the group must agree on the solution,) before the solutions are entered on the answer sheet.
4. Record the solutions to each problem (after the members of the group agree on it) on the separate answer sheet provided.

DO NOT MARK ON THE PROBLEM BOOKLET

5. You will have a time limit in which to complete the problems. Time will be marked from this tape recorder. It is not recording your discussion.
6. Now let us consider the first problem.

APPENDIX I

INSTRUCTIONS FOR PROBLEMS

(No-Stress)

(Please Read to Subjects)

1. Your goal is to solve all of the following problems through group discussion. Consider each solution a group effort. Feel free to speak as often as you want.
2. There is one, and only one, correct set of answers to each problem.
3. The solutions to the problems must have the consensus of the group (i.e. all members of the group must agree on the solution) before the solutions are entered on the answer sheet.
4. Record the solutions to each problem (after all of the group members agree on it) on the separate answer sheet provided.

DO NOT MARK ON THE PROBLEM BOOKLET

5. Now let us consider the first problem.

APPENDIX J

THE PROBLEMS

1. In a certain bank the positions of cashier, manager, and teller are held by Brown, Jones, and Smith, though not necessarily respectively.

The teller, who is an only child, earns the least.
Smith, who married Brown's sister, earns more than the manager.

WHAT POSITION DOES EACH MAN FILL?

2. Clark, Daw, and Fuller make their living as carpenter, painter, and plumber, though not necessarily respectively.

The painter recently tried to get the carpenter to do some work for him, but was told that the carpenter was out doing some remodeling for the plumber.

The plumber makes more money than the painter.
Daw makes more money than Clark.
Fuller has never heard of Daw.

WHAT IS EACH MAN'S OCCUPATION?

3. Clark, Jones, Morgan, and Smith are four men whose occupations are butcher, druggist, grocer, and policeman, though not necessarily respectively.

Clark and Jones are neighbors and take turns driving each other to work.

Jones makes more money than Morgan.

Clark beats Smith regularly at bowling.

The butcher always walks to work.

The policeman does not live near the druggist.

The only time the grocer and the policeman ever met was when the policeman arrested the grocer for speeding.

The policeman makes more money than the druggist or the grocer.

WHAT IS EACH MAN'S OCCUPATION?

4. In a certain department store the position of buyer, cashier, clerk, floorwalker, and manager are held, though not necessarily respectively, by Miss Ames, Miss Brown, Mr. Conroy, Mr. Davis, and Mr. Evans.

The cashier and the manager were roommates in college.
The buyer is a bachelor.

Evans and Miss Ames have had only business contacts with each other.

Mrs. Conroy was greatly disappointed when her husband told her that the manager had refused to give him a raise.

Davis is going to be the best man when the clerk and the cashier are married.

WHAT POSITION DOES EACH PERSON HOLD?

5. The Smith family, which consists of Mr. and Mrs. Smith, their son, Mr. Smith's sister, and Mrs. Smith's father, has for years dominated the community life of Plainsville. At the present time, the five members of the family hold among themselves the position of grocer, lawyer, postmaster, preacher, and teacher in the little town.

The lawyer and the teacher are not blood relatives.
The grocer is younger than her sister-in-law but older than the teacher.

The preacher, who won his letter playing football in college, is older than the postmaster.

WHAT POSITION DOES EACH MEMBER OF THE FAMILY HOLD?

APPENDIX K

ANSWER SHEET

NOTE: List the group's solutions to the problems here after the appropriate questions. The questions correspond to those asked after each of the problems.

1. WHAT POSITION DOES EACH MAN FILL?

_____	is the	_____
_____	is the	_____
_____	is the	_____
2. WHAT IS EACH MAN'S OCCUPATION?

_____	is the	_____
_____	is the	_____
_____	is the	_____
3. WHAT IS EACH MAN'S OCCUPATION

_____	is the	_____
_____	is the	_____
_____	is the	_____
_____	is the	_____
4. WHAT POSITION DOES EACH PERSON HOLD?

_____	is the	_____
_____	is the	_____
_____	is the	_____
_____	is the	_____
_____	is the	_____

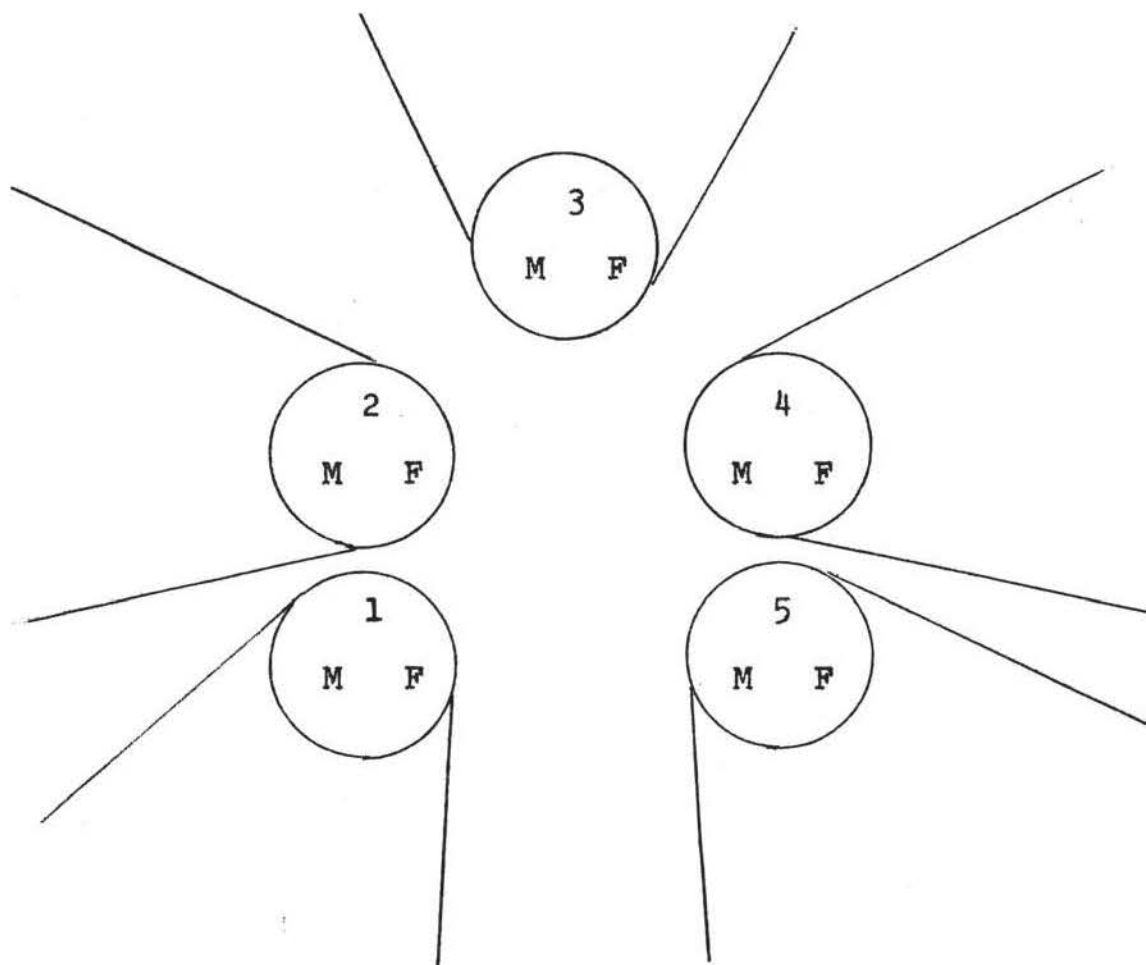
(Continued on next page)

5. WHAT POSITION DOES EACH
MEMBER OF THE FAMILY HOLD?

_____	is the	_____
_____	is the	_____
_____	is the	_____
_____	is the	_____
_____	is the	_____

APPENDIX L

INTERACTION OBSERVATION CHART



Group # _____ Exposure: SSt SN ASst AN

Leader: _____

Date: _____ Time: _____

TOTAL INTERACTIONS: _____

Observer: _____

APPENDIX M

POST-SESSION QUESTIONNAIRE

FINAL DATA SHEET

Indicate your honest reactions to the following questions by placing an X anywhere along the line at the point that best represents your feelings.

1. To what extent did you feel understood by your fellow group members?

not at all very little somewhat a lot completely

2. To what extent did you feel accepted by the group?

not at all very little somewhat a lot completely

3. Were you willing to help the group attain its goals?

not at all very little somewhat a lot completely

4. Did the other group members seem willing to help the group attain its goals?

not at all very little somewhat a lot completely

5. To what extent did you feel you were competing with other group members?

not at all very little somewhat a lot completely

6. To what extent did you feel other group members were competing with you?

not at all very little somewhat a lot completely

7. How would you characterize the "atmosphere" in your group?

hostile apathetic neutral pleasant very friendly

8. Was the session meaningful to you?

.....
 not at all very little somewhat a lot completely

9. Frankly, if you had time, would you like to return to further sessions with the same group?

_____ definitely would return

_____ strong desire to return

_____ feel neutral about it

_____ fairly strong desire not to return

_____ definitely do not want to return

10. Do you feel you would have gained more from the session in another group?

.....
 not at all very little somewhat a lot completely

11. How would you rate your group's ability to solve its problems?

.....
 poor fair average excellent superior

12. How would you rate the quality of the solutions reached by your group?

.....
 poor fair average excellent superior

APPENDIX N

ANALYSIS OF VARIANCE

$$\bar{X}_{AS} =$$

$$\bar{X}_{ANS} =$$

$$\bar{X}_{SS} =$$

$$\bar{X}_{SNS} =$$

$$\bar{X}_{TOT} =$$

$$\bar{X}_{AS}^2 =$$

$$\bar{X}_{ANS}^2 =$$

$$\bar{X}_{SS}^2 =$$

$$\bar{X}_{SNS}^2 =$$

$$\bar{X}_{TOT}^2 =$$

$$\Sigma X^2 =$$

$$SS_{TOT} = (\Sigma X^2) - (N_{TOT} \bar{M}_{TOT}^2)$$

=

$$SS_{TOT} = \underline{\hspace{2cm}}$$

$$SS_{bg} = N_1 M_1^2 + N_2 M_2^2 + N_3 M_3^2 + N_4 M_4^2 - N_{TOT} \bar{M}_{TOT}^2$$

=

=

$$SS_{bg} = \underline{\hspace{2cm}}$$

$$SS_{bg} = SS_{TOT} - SS_{bg}$$

$$SS_{wg} = \underline{\hspace{2cm}}$$

$$df_{bg} = k - 1$$

$$df_{bg} = \underline{\hspace{2cm}}$$

$$df_{wg} = N - k$$

$$df_{wg} = \underline{\hspace{2cm}}$$

APPENDIX N (Continued)

$$MSbg = \frac{SSbg}{dfbg}$$

=

$$MSbg = \underline{\hspace{2cm}}$$

$$MSwg = \frac{SSwg}{dfwg}$$

=

$$MSwg = \underline{\hspace{2cm}}$$

$$F = \frac{MSbg}{MSwg}$$

$$F = \underline{\hspace{2cm}}$$

$$p = \underline{\hspace{2cm}}$$

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ABSTRACT

THE EFFECTS OF LEADER PRESENCE
AND MODERATE STRESS ON SMALL GROUP
SENTIMENT AND INTERACTION

BY

RAY LEWIS CORDON

B. S. in Ed., Eastern Illinois University, 1968

ABSTRACT OF A THESIS

Submitted in partial fulfillment of the requirements
for the degree of Master of Arts at the Graduate School
of Eastern Illinois University

CHARLESTON, ILLINOIS
1972

ABSTRACT

The purpose of this investigation was to determine the effects of leader presence and moderate stress upon sentiment and interaction in small groups. Seventy-four students were selected from the required speech course at Eastern Illinois University to serve as subjects. These subjects were assigned to sixteen groups, ranging from four to five members per group.

Silent and absent leadership, imposed stress and no stress were introduced to the groups through a 2 X 2 factorial design. In one condition (N = 18) the group leader provided instructions and then remained silent during group interaction, and moderate stress--an announced time barrier--was introduced to the group. In another condition (N = 19) the leader remained silent during group interaction, but no stress was imposed. In a third exposure (N = 18) the leader was not present during group interaction, and moderate stress was imposed. In the fourth variation (N = 19) the leader was not present during interaction and no stress was imposed.

All the groups were exposed to twenty minutes of problem-solving discussion with the leader initiating the appropriate style of leadership and stress. Each group attempted to provide solutions to the same set of deductive thought problems. Each group received the same introductory instructions and the appropriate comments concerning style of

leadership and stress.

Sentiment data were obtained by twelve items on a post-session questionnaire that explored the feelings of the participants about group atmosphere, willingness to contribute to group goals, competition, and group morale. Interaction information was gathered by trained interaction observers who recorded the utterances of each group participant.

The results indicated the following: (1) although by numerical examination the Absent leader-No Stress exposure revealed the highest level of sentiment and the Silent leader-No Stress exposure revealed the lowest level, these differences were not statistically significant; (2) subjects in the Absent leader-Stress exposure rated highest in interaction; (3) subjects receiving the Silent leader-Stress exposure and subjects receiving the Absent leader-No Stress exposures rated equally in interaction; and (4) subjects receiving the Silent leader-No Stress exposure rated lowest in interaction, but not significantly lower than subjects in the Absent leader-No Stress exposure.