AN INVESTIGATION OF THE RELATION BETWEEN EXCLUSIVE
POSSESSION OF INFORMATION AND ATTEMPTS
TO LEAD IN SMALL GROUPS

DISSERTATION

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By

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* * * * * * *

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. INTRODUCTION AND HISTORY OF THE PROBLEM</td>
<td>1</td>
</tr>
<tr>
<td>General nature of research on leadership</td>
<td>1</td>
</tr>
<tr>
<td>Theories of leadership</td>
<td>4</td>
</tr>
<tr>
<td>Hypothesis to be tested</td>
<td>13</td>
</tr>
<tr>
<td>II. METHODS AND PROCEDURES</td>
<td>21</td>
</tr>
<tr>
<td>Design of the experiment</td>
<td>21</td>
</tr>
<tr>
<td>The dependent variable and observation procedure</td>
<td>25</td>
</tr>
<tr>
<td>The experimental tasks</td>
<td>26</td>
</tr>
<tr>
<td>Subjects</td>
<td>28</td>
</tr>
<tr>
<td>The experimental procedure</td>
<td>32</td>
</tr>
<tr>
<td>III. RESULTS AND DISCUSSION</td>
<td>34</td>
</tr>
<tr>
<td>Analysis of information test scores</td>
<td>34</td>
</tr>
<tr>
<td>Measurement of the dependent variable</td>
<td>37</td>
</tr>
<tr>
<td>Analysis of attempted leadership act scores</td>
<td>40</td>
</tr>
<tr>
<td>Discussion of results</td>
<td>44</td>
</tr>
<tr>
<td>IV. SUMMARY AND CONCLUSIONS</td>
<td>49</td>
</tr>
<tr>
<td>Summary of procedures</td>
<td>49</td>
</tr>
<tr>
<td>Summary of results</td>
<td>50</td>
</tr>
<tr>
<td>Conclusions</td>
<td>51</td>
</tr>
</tbody>
</table>

**APPENDIX**

<p>| A. OBSERVER'S MANUAL | 52 |
| B. SUBJECT SCREENING QUESTIONNAIRE | 72 |</p>
<table>
<thead>
<tr>
<th>APPENDIX</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. MATERIALS RELATED TO THE EXPERIMENTAL TASKS</td>
<td>78</td>
</tr>
<tr>
<td>D. INSTRUCTIONS TO SUBJECTS</td>
<td>83</td>
</tr>
<tr>
<td>E. THE EXPERIMENTAL DATA</td>
<td>88</td>
</tr>
<tr>
<td>SELECTED BIBLIOGRAPHY</td>
<td>90</td>
</tr>
</tbody>
</table>
LIST OF TABLES

<table>
<thead>
<tr>
<th>TABLE</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Screening Test Scores for 24 Naive Subjects</td>
<td>30</td>
</tr>
<tr>
<td>II. Means and Standard Deviations for Information Test Scores</td>
<td>36</td>
</tr>
<tr>
<td>III. Results of Comparisons of Mean Differences on Information Test Scores</td>
<td>37</td>
</tr>
<tr>
<td>IV. Intra-class Correlation of Tallies of Attempted Leadership Acts by the Observers</td>
<td>38</td>
</tr>
<tr>
<td>V. Means, Variances, and Standard Errors of the Means for the Six Classes of Subjects</td>
<td>40</td>
</tr>
<tr>
<td>VI. Bartlett's Test for Homogeneity of Variances among the Six Classes of Subjects</td>
<td>41</td>
</tr>
<tr>
<td>VII. Predictions of the Relationships among Mean Number of Attempted Leadership Acts for the Six Classes of Subjects</td>
<td>42</td>
</tr>
<tr>
<td>VIII. Tests of the Differences among the Mean Number of Attempted Leadership Acts for the Six Classes of Subjects</td>
<td>43</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION AND HISTORY OF THE PROBLEM

General Nature of Research on Leadership

Man's activities are usually conducted within the framework of some sort of organization and, within such organizations, there are normally one or more persons who are recognized as the leader(s). These leaders are universally recognized as being important determinants of the end-products of much of human behavior. As Hemphill (12, p. 3) has pointed out, "both laymen and scientists agree that if we can understand the selection and training of leaders we can begin to take adaptive steps toward controlling our own social fate." Despite the acknowledged importance placed upon leadership, relatively little attention has been devoted to the scientific study or analysis of this phenomenon until very recent years.

Although it is true that the scientific consideration of leadership is of recent origin, the problem has not been entirely overlooked by our predecessors. It has long been the subject of hortatory speculation and discussion. This too, as with so much of our knowledge, was dealt with by the ancient Greeks. Foremost
among these was Plato, who dealt intensively with the nature and characteristics of leadership in *The Republic.* To Plato, the essence of leadership was reason guided by wisdom. This philosophical evaluation of leadership, defined in terms of reason, set the tone for speculation concerning leadership for some 1,800 years. During the Reformation period there appeared various works that interpreted leadership as a function of force or might. Drawing upon the ideas of the Sophists, men like Thomas Hobbes in *The Leviathan* and Machiavelli in *The Prince* described leadership in terms of the "strong man." Since then, until recent times, concepts of leadership drew their inspiration from these two schools of thought, either accepting one of the two or attempting some synthesis of them.

It is difficult to determine precisely when scientific consideration of leadership began, although it seems fair to say that it began around the turn of the century. Gibb (11) reports the claim of one writer that in 1896 there were no books on leadership in the Library of Congress. The initial efforts to investigate leadership implicitly assumed a synthesis of the two schools of thought mentioned above. Thus leadership was conceived of as an outgrowth of personality traits; and among the traits sought for, and reported in the literature, are such characteristics as superior
intelligence and knowledge on the one hand and dominance and aggressiveness on the other.

Within the last decade reviews by Stogdill (25) and Jenkins (18) have given us some idea of the diversity of traits or personal qualities that have been ascribed to leaders. Stogdill has classified these under five headings: (1) capacity - includes intelligence, alertness, verbal facility, originality, and judgment; (2) achievement - includes scholarship, knowledge, and athletic accomplishment; (3) responsibility - includes dependability, initiative, persistence, aggressiveness, self-confidence, and the desire to excel; (4) participation - includes activity, sociability, cooperation, adaptability, and humor; and (5) status - refers to socio-economic position and popularity.

From this we can see that the traits ascribed to leaders are diverse indeed. It is noteworthy that no consistent general pattern of traits which characterize leaders has been isolated in the large number of studies devoted to this approach. The results of the leadership research employing the trait approach are perhaps best summed up in the conclusions Jenkins reaches from his review of the literature. He states that "no single trait or group of characteristics has been isolated which sets off the leader from the members of his group" (18, p. 73). Further, he concludes, subject to confirmation through research, that "leadership is
specific to the particular situation under investigation" (18, p. 74). This is similar to Stogdill's conclusion that the "qualities, characteristics, and skills required in a leader are determined to a large extent by the demands of the situation in which he is to function as a leader" (25, p. 63).

These reviews have served to indicate that there have been, in the past, two general approaches to the study of leadership. The first, which we may call the trait approach, assumed that leadership was essentially a personality function while the second, which we may call the situational approach, assumed that leadership was a function of the specific characteristics of a given leadership situation. Recently developed theories of leadership have amalgamated these two positions in attempting systematic explanations of leadership.

Theories of Leadership

As has been pointed out, the scientific study of leadership is a relatively recent development. With the growth of scientific interest in the problem there have been attempts to formulate theories to account for this aspect of social organisation. Most of these theories have been very general in nature, i.e., they describe leadership as a result of such broad factors as heredity, personality, or environment without specifying any precise functional relationships between more specific variables and leader behavior. In the
last few years several theories of the latter type have appeared, and it is to be hoped that more effort will be expended in this direction.

A brief review of theories of leadership will be presented here with a somewhat more extended discussion of two recent theories of the more specific type, especially that of Hemphill (13) with which this study is concerned.

Smith and Krueger (24), writing in 1933, classified "explanations of leadership" into three categories: (1) leadership as myth and fiction, (2) leadership as a composite of traits in the individual; and (3) leadership as the result of inter-stimulation between the group and the leader. The first category of explanation refers to attempts to account for leadership as a sort of myth created by the large numbers of people who ascribe all sorts of virtues and abilities to those who have risen to positions of prominence or responsibility. The second category represents those explanations that are an outgrowth of the trait approach to research on leadership which was discussed above, and the third category exemplifies the situational approach mentioned above.

Gibb (11), writing in 1954, presents a picture strikingly similar to that described by Smith and Krueger some twenty years earlier. He describes three possible theories of leadership, which he identifies as the unitary trait theory, the constellation-of-traits theory, and the
interactional theory. The unitary trait theory, which postulates a single personality trait of leadership, has given rise to a modification in the form of the constellation-of-traits theory which asserts that there is a common pattern of traits that differentiates leaders from others. Both types of theory are rejected by Gibb on the ground that the available empirical evidence indicates that the personalities of leaders are often markedly different. Finally, Gibb discusses the interactional theory which maintains that (1) leadership is relative to a given situation, (2) the leadership process is one of social interaction, and (3) the determination of a leader is dependent upon the group members' perceptions of individual differences among themselves. He concludes, "In general, it may be said that leadership is a function of personality and of the social situation, and of these two in interaction" (11, p. 917).

This pithy statement seems to summarize very well the present state of knowledge—or lack of knowledge—concerning leadership and the direction that current thinking proposes for theories of leadership to follow. Two such theories that have recently been proposed will be considered below. But before taking these up, we might note parenthetically an interesting paper by Touchet (26) who, in discussing the function of supervisors, proposes that leadership action is to be defined as the transformation of exclusively possessed information
into action and should be evaluated accordingly.

Bass's Psychological Theory of Leadership

Bass (4) has devised what he refers to as a "miniature empirical-theoretical" system to account for leadership. Patterning his methodology after that developed by Hull (15, 16), Bass has developed a set of postulates based upon empirical research on leadership or upon what "are regarded as valid generalizations in other areas of investigation--primarily in learning and motivation" (4, p. 5). Using a number of concepts developed for this theory, he attempts to deduce relationships among these concepts based upon the set of postulates referred to.

Among the concepts most relevant to the present study are interaction, leadership, and control. Bass's definitions of these terms will be given, and two of his theoretically derived hypotheses employing them will be presented. The definitions follow:

a. Interaction- "Two persons, A and B, are said to have interacted when one or more acts of A have stimulated B and when one or more acts of B have stimulated A" (4, p. 9).

b. Leadership- "Leadership occurs when one member, A, behaves in a way directed toward the goal of changing another member, B's, behavior; more specifically, the goal of
(1) changing the intensity and/or direction of the needs of B; and/or
(2) restructuring B's abilities--perceptual, cognitive, or behavioral--
to cope with the situation and reduce his needs" (4, p. 9).

c. Control- "The control of one member, A, over
another member, B, is the extent to which A is perceived by B to be
able to augment or hinder B in B's efforts to achieve his goals"
(4, p. 18).

The concept of leadership is broken down into three cate-
gories, one of which we must describe here in some detail because
this categorization is similar to one which will be discussed later
in relation to the theory from which this study is derived. Bass\(^1\)
divides leadership acts into three categories: (1) attempted vs.
non-leadership acts, (2) successful vs. aborted leadership acts, and
(3) effective vs. ineffective leadership.

Attempted leadership acts are defined as "all acts in
which one member, A's, behavior is directed at the goal of changing
the behavior of another member, B, by changing B's motivation or
perception of the situation. All other acts of A are not leadership
acts" (4, p. 14).

\(^1\)Bass (4, p. 14) has acknowledged that these distinctions were
brought to his attention by Hemphill.
Since the present study is concerned with attempted leadership acts as its dependent variable (as conceptualized within another theoretical framework, however), we should note carefully what is implied by such a concept even though in Bass’s theory it is defined differently from the way in which it will be treated later. The concept of attempted leadership suggests that an individual may try to lead regardless of whether he has attained a position of or recognition as leader. Thus there is the implication that leader behavior may be studied prior to the establishment of a leader position. There is the further connotation that such attempts are observable and that they need not contribute to the efficiency of a group’s operations.

In his discussion of the attempted leadership act, Bass goes on virtually to equate attempted leadership with sheer activity, at least in the leaderless group discussion situation. This catch-all conception is considered by the present writer as too inclusive to be of much value in the analysis of leadership behavior.

The concepts of successful and effective leadership acts are less pertinent to the present study. Briefly, successful leadership acts are those in which A reaches his goal of changing B and effective leadership acts are those in which B’s change in behavior, brought about by A, results in need satisfaction for both
A and B.

These concepts are involved in two of the 62 hypotheses Bass has devised within his theoretical framework. These hypotheses (numbers 11 and 13 in his theory) are of special interest at this point because they hypothesise relationships similar to those under test in the present work. They are stated as follows:

a. "Hypothesis 11: A member will be more likely to display successful leader behavior, the more he has the skills, knowledge, abilities and understandings to aid in solving the group's problems and interaction difficulties and increase its effectiveness" (4, p. 38).

b. "Hypothesis 13: A member who lacks the skills and abilities to solve the group's problems will tend to reduce or avoid attempting leadership acts" (4, p. 39).

These two statements are similar to the hypothesized relationship tested in the present investigation. They do differ in some respects, however, from the hypothesis to be tested. First, hypothesis 11 above relates "successful leader behavior" to knowledge, whereas this study relates only attempted leader behavior to possession of knowledge. Second, hypothesis 13 above predicts an inhibition of leader behavior in the absence of necessary skills and abilities, whereas the present hypothesis makes no such prediction.
It states that there will be a greater number of attempts to lead by those who exclusively possess knowledge but does not go on to imply a reduction in or cessation of the attempted leadership behavior of others.

Hemphill's Proposed Theory of Leadership in Small Groups

Hemphill (13) has formulated a tentative theory of leadership in small groups which incorporates both the trait and situational aspects of leadership. Certain key concepts of this theory must be defined before it is possible to discuss the theory meaningfully. These concepts are defined as follows:

a. "A mutual problem is a situation involving two or more individuals, each of whom perceives the situation as dissatisfying, and that requires some behavior on the part of the other if either (any) is to be satisfied" (13, p. A-2).

b. "Interaction is defined as a series of reciprocal acts involving two persons, where the intentions governing the acts of each are influenced by acts, or expectations of the acts, of the other" (13, p. A-6).

c. "Structure-in-interaction is defined as a consistency in behavior occurring during interaction that permits the prediction of the behavior that will occur in future interaction" (13, A-8).
d. "Attempted leadership acts are acts accompanied by an intention of initiating structure-in-interaction of others during the process of mutual problem solution" (13, p. A-18).

In discussing the factors that determine attempts to lead, Hemphill (13, p. A-27) presents the following paradigm:

Figure 1 - Factors Determining Attempts to Lead

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<tr>
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<th>Estimates of Consequences</th>
<th>Motivation to Action</th>
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<tr>
<td>Mutual Problem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1.</td>
<td>High probability of solving problem</td>
<td>C5. High dissatisfaction with mutual problem</td>
</tr>
<tr>
<td>Need Disposition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B3.</td>
<td>Increase in potential of group to satisfy needs.</td>
<td>D7. High strength of need to be satisfied.</td>
</tr>
<tr>
<td>4.</td>
<td>Decrease in potential of group to satisfy needs.</td>
<td>8. Low strength of need to be satisfied.</td>
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</table>

The present study is concerned with Cell A of this paradigm. With respect to this cell, the theory states:

An individual will be influenced to estimate that a leadership act has a high probability of being effective in the solution of a mutual problem if, through previous experience with a similar problem, he had
observed the act to be effective. Successful past experience with problems of the general type involved in the mutual problem is a significant variable that influences such estimates. Very closely related to this experience variable is the ability of the individual to follow clearly the probable consequence of the act under consideration. This ability involves (1) knowledge of the details of the mutual problem, (2) possession of relevant information (perhaps not available to other group members), and (3) the ability to anticipate the probable reaction of others to the course of action under consideration (italics mine) (13, p. A-26).

The hypothesis to be tested in this study is derived directly from this statement.

Hypothesis to be Tested

The relationships postulated in the above paragraph give rise to the hypothesis to be tested here, namely, the exclusive possession of information relevant to a mutual problem will result in a greater number of attempts to lead during the course of working on mutual problem solution.

History of the Problem

Previous research that is directly relevant to the hypothesis under test is very limited. This is due in large measure to the fact that in the past leadership behavior has been studied after the fact, i.e., only after a leader has been appointed, has "emerged," or has otherwise been identified, does his behavior
become of interest to the scientist. Typical of this sort of research is the work employing the leaderless group discussion (1, 3) as a technique for studying leader behavior. One exception is the recent monograph by Bass, Wurster, Doll, and Clair (6) in which "amount of participation or attempted leadership activity" was employed as one of a large number of variables included in a study intended to increase understanding of leadership among sorority women and to assess the potentialities of various assessment procedures. However, the difference in definition of attempted leadership as employed by Bass and his associates and as it is used in this study makes comparison difficult, if not impossible.

Another reason for the paucity of research on this problem is that the relationship between knowledge and leadership is often assumed or discussed but is seldom studied. Thus, Smith and Krueger (24), for example, in their earlier review of the literature on leadership, devote an entire chapter to "Traits of Leaders." The very first trait discussed is knowledge. The authors state, "Perhaps the most fundamental of all the characteristics of the leader is knowledge..., Effective and permanent leadership in any situation is based upon knowledge" (24, p. 28). But not one of the 121 items in their bibliography is quoted to present research evidence to support these statements.
Some representative theoretical and speculative thinking about the relationship between knowledge and leader behavior will be presented here and then some empirical evidence bearing on this relationship will be discussed. It will be recalled that Bass's theory maintained that skill and knowledge increase the probability of an individual's displaying successful leader behavior, and that Hemphill relates possession of information to attempts to lead.

Knickerbocker (20), in outlining a systematic frame of reference upon which a theory of leadership might be based, classifies skill and knowledge as factors that may motivate an individual to lead. In discussing the question of why the leader leads, he says, "The motivation of the individual certainly plays a part in the likelihood of his leading. Many adults seem to dislike to lead. Others lead occasionally when, by reason of some special skill or knowledge they possess, it seems to them or to the group reasonable that they should do so" (20, p. 31). Note that this classification of knowledge as a variable possibly motivating a person to lead is similar to Hemphill's conception of the variable.

Blain et al. (7) categorize knowledge as a personal trait that contributes to a person's status and thereby makes the individual a likely leader. Carter (9) conceives of skill and knowledge as individual attributes which must be taken into consideration as one
of many determiners of group behavior. He says that "... individuals bring to the group certain abilities which can be used in achieving the group's goal. One individual brings technical skills, while another is adroit administratively" (9, p. 259).

There is available some experimental evidence on the relationship between knowledge and attempted leadership behavior. Jack (17) found that nursery school children who were relatively low in "ascendant behavior" showed a marked increase in such behavior after they were given training on various games. This increase was observed even though their playmates were children who previously had been rated high on ascendancy. However, the playmates had not had any previous experience with these particular games. Ascendant behavior included "(1) attempts to pursue one's own interests when they conflict with those of others and to direct the behavior of one's companions, and (2) success in these two types of attempts as indicated by compliance on the part of one's companions" (17, p. 12). Interestingly enough, the author's scores of ascendant behavior included both attempts and successes. Of these two classes of behavior, by far the greatest increase was found in attempts to direct others as compared to attempts to secure materials or to successes in securing materials and directing others. An extension of this study by Page (22) resulted in similar findings. Thus, for chil-
dren, specific training experiences, i.e., acquisition of knowledge, result in the modification of behavior similar to that included in the definition of attempted leadership.

Borgatta, Bales, and Couch (8) found that 3-man groups containing a "great man" were more productive than groups without such an individual in working on a discussion task. "Great men" were defined as being scored relatively high on task ability, individual assertiveness, and social acceptability. To the extent that task ability is one of the factors entering into the identification of great men, they found that there was a relationship between possession of information about the task and the frequency of "giving suggestions and obtaining agreements" (Bales's (2) categories 3 and 4) for the group. Measurements were not obtained for individuals, but only for the group as a whole. Since there is some similarity between Bales's categories 3 and 4 and the concept of attempted leadership, this study indicates that there may be a relationship between knowledge and attempts to lead based upon group scores.

Carter (9), in summarizing some of his research, reports that the behavior of leaders differs significantly in some respects from that of followers, regardless of the task or of whether the leader was appointed or permitted to emerge. The greatest difference was observed in behaviors related to getting insight into the task or analyzing the situation. Both of these categories of behavior
would seem to depend upon knowledge of the task, indicating that such knowledge contributes to the differentiation between leaders and followers.

On the other hand, Shaw (23) found that the amount of information possessed by an individual did not affect the number of messages passed by persons in various communication nets nor did it influence the emergence of a leader as measured by sociometric choice. However, Shaw's subjects communicated by passing written notes to each other, and there is no way of determining the extent to which these messages might or might not reflect leadership behavior.

Finally there is one study that is directly pertinent to the present hypothesis and in which the writer collaborated. Hemphill et al. (14) tested the effect of possession of task relevant information upon attempts to lead with negative results. In this experiment various members of four-man groups were provided with booklets containing relevant information about one, two, or three of four novel tasks and irrelevant information about the remaining task(s). After reading the booklets, the subjects proceeded to work on the tasks for fifteen minutes each. Under these conditions, there were no differences in attempts to lead associated with possession of information.
In the analysis and evaluation of this study, certain experimental deficiencies came to light. One had to do with the feedback process occurring during a group's interaction. Often one or more subjects who had been given relevant information about the group's task would proceed to inform the other group members about what they knew. Consequently the experimental classification of subjects as possessors or non-possessors of information was apt to be vitiated. This problem of the distribution of information is related to another possible difficulty, namely that the amount of information supplied to the subjects about some of the tasks was relatively small. This seemed to give rise in some instances to a feeling that the information available was not sufficient for the problem at hand. On the other hand, in some of the tasks the subjects apparently failed to perceive the relevance of their information so that again the experimental classification of possessor vs. non-possessor of relevant information was without effect. Another possible difficulty in the procedure was that the same four individuals performed on the four tasks together. Thus any status relationships established on the early trials might operate to negate the effects of the experimentally introduced variables. Bass and Wurster (5) have shown that leader behavior is associated with previous status relationships that may exist among participants. These considerations
have instigated an attempt to test the stated hypothesis using a different experimental procedure; the present experiment comprises that attempt.
CHAPTER II

METHODS AND PROCEDURES

Design of the Experiment

The experiment is designed to test the hypothesis that the exclusive possession of information relevant to a mutual problem will result in a greater number of attempts to lead during the course of working on mutual problem solution. The hypothesis will be tested experimentally in a laboratory situation.

Special problems of procedure arise in attempting to establish the conditions necessary to test this hypothesis. Some of these difficulties were enumerated in discussing the Hemphill, et al (14), experiment in the previous chapter. The experimental deficiencies which manifested themselves in that experiment had to do with: (1) the feed-back process during a group's interaction, which nullified the classification of individuals as possessors or non-possessors of information; (2) the possibility that possessors of information might fail to perceive the relevance of their information to the mutual problem at hand; and (3) the possible contaminating effects on later leader behavior of status relationships established during the group's performance on preceding problems.
Another problem which must be taken into consideration is (4) the degree to which individual differences in predisposition to lead may operate to obscure the effects of experimentally introduced conditions. Finally, (5) when the subjects are to perform on more than one task, it is desirable that the order in which the tasks are undertaken be counterbalanced.

The experiment was designed to take into account all of the factors listed. The means by which these factors were accounted for will be discussed in the same order in which they are presented above. The first two problems were disposed of by selecting as exclusive possessors of information subjects whose training qualified them as experts on one of the experimental tasks. It was felt that such an individual could not reasonably fail to perceive the relevance of certain of his store of knowledge to the task now facing his group. At the same time, it was reasoned that an expert who knew a great deal about the task with which his group was confronted would find that it was impractical for him to attempt to "educate" his fellow group members in a relatively brief period of time. This would make it impossible for him to distribute sufficient information among group members to vitiate the experimental classification of subjects as either possessors or non-possessors of information.
The best method for avoiding the effects on leader behavior of status relationships established during a group's performance on earlier problems would be to have all the subjects perform on only one task. Such a procedure, however, would make it difficult, if not impossible, to control the effects of individual differences in predisposition to lead. These two difficulties can both be handled satisfactorily by having each expert subject perform on two tasks - on one as an expert and on the other as a non-expert. In this manner each expert subject can be used as his own control, and the possible effect of individual differences in predisposition to lead is thereby eliminated. At the same time, status relationships can be avoided by reconstituting groups after they have performed on one task so that no individual ever works on the second problem with anyone with whom he has previously been associated.

The use of two tasks makes it possible to counterbalance relatively simply the order in which the tasks are undertaken, as there are only two possible orders.

There is no ready solution to the question of the number of groups to be run. In this instance, the answer was provided by the number of subjects found to be available for the experiment. It was possible to obtain twelve individuals who were expert on each one of the experimental tasks but not the other. Consequently
the number of groups to be run was set at twenty-four by this limitation. As a further source of comparison each group contained, in addition to the two individuals chosen for their information, one subject who was naive with respect to both tasks. Administrative problems in scheduling groups made it impossible to reschedule the naive subject to perform on the second task. Consequently each group was composed as follows:

(1) an individual who was expert on the group's present task but who was inexperienced on the other task in the experiment (designated as an "expert"),

(2) an individual who was inexperienced on the group's present task but who was an expert on the other task in the experiment (designated as a "non-expert"),

(3) an individual who was inexperienced on both tasks in the experiment but who performed on only one of them (designated as a "naive" subject).

As an additional precaution against the existence of undesirable status relationships among the subjects, steps were taken to insure that all the members of a group were initially unacquainted. The paradigm of the experiment is shown below:
The Dependent Variable and Observation Procedure

The dependent variable of this study - the attempted leadership act - has been defined earlier (see p. 12). This theoretical definition alone is not adequate to make explicit those acts which are classified as attempted leadership. For this purpose, an Observer's Manual (Appendix A) was prepared for use in training those who act as observers of attempted leadership acts. All three of the individuals who participated as observers in this study had previous experience in this work.

Two observers were present at each experimental session. They viewed the group's efforts through a one-way vision mirror. The observation room was equipped with a sound system that picked up the conversation of the group from two overhead microphones in
the laboratory. The conversation of each group was recorded through the use of a Soundscriber recorder. The observers were enabled thereby to discuss any difficulties or disagreements in their scoring of a group's conversation, but they were not permitted to change the tallies they had made during the experimental session. Thus, the discussions served the purpose of a continuing "recalibration" without, however, effecting any changes in observations already tallied.

The subjects wore different colored lab coats so that the observers might readily identify them in recording their tallies. The group worked at a table placed just under the one-way mirror and against the wall in which the mirror was set. As a result, the observers looked directly at the faces of the subjects, thereby maximizing their ability to identify the sources of the conversation they heard.

The Experimental Tasks

Two experimental tasks were required by the experimental design. The tasks had to conform to the following criteria:

1. they must require specialized knowledge for solution;

2. the possibility of applying "common sense" to their solution must be held to a minimum;
(3) they must generate a satisfactory amount of verbal interaction within a three-man group;

(4) there must be available two groups of individuals each of which possesses the specialized knowledge required by one of the tasks but knows little or nothing of the other. A third class of subjects who know little or nothing about either task must also be available. In accordance with these criteria an electronics assembly task and a statistical task were devised. Descriptions of these tasks follow.

The electronics assembly task

The group was given three boxes containing a large number of salvaged electronic parts, a 12" x 18" schematic diagram of an electronic circuit containing forty-six components, and a 22" x 56" assembly board on which was reproduced the schematic diagram with a 2" square substituted for each symbol contained in the schematic. The group's task was to find the parts indicated in the schematic diagram and to place them in the appropriate squares on the assembly board. The electronic parts were assorted randomly in three boxes except that the tubes were separated into a separate container to avoid breakage. An inventory of the parts made available to the groups and a
reproduction of the schematic diagram are presented in Appendix C. Thirty minutes was allowed for working on the problem. Previous experience with this type of experimental problem had indicated that thirty minutes was an adequate time limit for this and the following problem.

The statistical task

Each member of the group was given an identical sheet of paper listing in random order the heights of eighty boys measured to the nearest tenth of an inch (see Appendix C). The group was instructed to compute the arithmetic mean of these data and to construct a histogram and an ogive based upon the data. In addition, the arithmetic mean was to be "appropriately indicated" on both the histogram and ogive. The materials provided for each group included ten sheets of graph paper (six squares to the inch), a set of twelve colored lead pencils, a black lead pencil and pad of scratch paper for each group member, and one 12-inch ruler. Thirty minutes was allowed for working on the problem.

Subjects

Forty-eight male subjects participated in the experiment. They formed three classes - one class of experts on the electronics
assembly task (n = 12), one class of experts on the statistics task (n = 12), and one class of subjects who were naive with respect to both tasks (n = 24). The naive subjects were obtained through the use of a screening test (see Appendix B) which was administered to over 300 male students of general psychology. The test contained twenty multiple choice items - each having four alternatives - ten items dealing with the electronics task and ten dealing with the statistics task. Chance performance on such a test is represented by a score of 2.5 on each subtest. The experimental design required only that a person score low on one of the subtests; but since it was impossible to determine in advance which task these subjects would perform, it became necessary to select individuals who scored low on both subtests. Thus, ideally, individuals would have been selected as subjects only if their scores on the two subtests were three and two or any combination of scores less than these. Extending these cut-off scores minimally to include scores of three and three, eighteen subjects were made available. The remaining six received a score of four on one of the sub-tests. The distribution of scores on the screening test for the naive subjects is shown in Table I.
Table I

Screening Test Scores for 24 Naive Subjects

<table>
<thead>
<tr>
<th>Subj</th>
<th>Task Performed</th>
<th>Electronics Test Score</th>
<th>Subj</th>
<th>Task Performed</th>
<th>Statistics Test Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>e</td>
<td>3</td>
<td>37</td>
<td>s</td>
<td>2</td>
</tr>
<tr>
<td>26</td>
<td>e</td>
<td>2</td>
<td>38</td>
<td>s</td>
<td>4</td>
</tr>
<tr>
<td>27</td>
<td>e</td>
<td>1</td>
<td>39</td>
<td>s</td>
<td>2</td>
</tr>
<tr>
<td>28</td>
<td>e</td>
<td>2</td>
<td>40</td>
<td>s</td>
<td>2</td>
</tr>
<tr>
<td>29</td>
<td>e</td>
<td>4</td>
<td>41</td>
<td>s</td>
<td>2</td>
</tr>
<tr>
<td>30</td>
<td>e</td>
<td>0</td>
<td>42</td>
<td>s</td>
<td>3</td>
</tr>
<tr>
<td>31</td>
<td>e</td>
<td>0</td>
<td>43</td>
<td>s</td>
<td>0</td>
</tr>
<tr>
<td>32</td>
<td>e</td>
<td>3</td>
<td>44</td>
<td>s</td>
<td>4</td>
</tr>
<tr>
<td>33</td>
<td>e</td>
<td>4</td>
<td>45</td>
<td>s</td>
<td>2</td>
</tr>
<tr>
<td>34</td>
<td>e</td>
<td>2</td>
<td>46</td>
<td>s</td>
<td>2</td>
</tr>
<tr>
<td>35</td>
<td>e</td>
<td>3</td>
<td>47</td>
<td>s</td>
<td>2</td>
</tr>
<tr>
<td>36</td>
<td>e</td>
<td>3</td>
<td>48</td>
<td>s</td>
<td>2</td>
</tr>
</tbody>
</table>

Mean 2.25 2.25

The subjects who were experts on the tasks involved in the experiment were obtained by seeking volunteers from special groups whose members might be presumed to possess...
sufficient requisite information to be classified as experts. Thus members of the Columbus Amateur Radio Association were contacted to locate individuals who were knowledgeable about electronics, and persons who had received a grade of A or B in an advanced undergraduate course in statistics were solicited to obtain individuals who were expert in statistics.

It was planned to administer the screening test to these individuals also, in order to eliminate the possibility of selecting persons who possessed a significant amount of information about both experimental tasks. Administrative difficulties made this procedure infeasible since these subjects were not available to the experimenter prior to the time of their actual participation in the experimental sessions. Consequently expert subjects were selected solely in terms of their demonstrated proficiency in the area appropriate to each task. A check on their knowledge about the task on which they were supposedly uninformed was made available by the scores they obtained on a test administered after performance on this task.

Additional selection criteria were established in order to eliminate the extraneous factors of physical characteristics of individual group members. The groups were kept relatively homogeneous with respect to age by limiting subjects to the age
range 17-26. Only white males with no overt physical handicaps or disfigurements were chosen. In addition, only persons who were between 5' 2" to 6' 4" in height and between 100 to 250 lbs. in weight were acceptable.

The Experimental Procedure

Three-man groups were scheduled by phone. At the time of scheduling it was ascertained that none of the potential group members was acquainted with any other. When the subjects assembled at the appointed time, they were met by the experimenter, who escorted them directly into the laboratory. After a brief explanation to the effect that the experiment was concerned with "the way groups worked together" (see Appendix D for instructions to subjects), the group went to work on their assigned problem for a thirty minute period. At the end of this time, the non-expert and the naive subjects were given the ten item subtest which had previously been administered to the naive subjects as part of the screening questionnaire. This permitted a comparison of the performance of naive subjects and non-experts on the test after each had worked on the problem. Thus a check on the non-expert's possession of information about the task with which he was presumably unfamiliar was made available. The group was dismissed after telling the expert and
non-expert privately that they would be rescheduled within a week or two. These subjects were scheduled as members of different groups to take part in the second experimental session.
CHAPTER III

RESULTS AND DISCUSSION

The analysis of the data will take the following form. First, the scores on the information tests will be analyzed to determine if the experimental conditions were maintained throughout the experiment. Second, the measurement of the dependent variable will be examined. This will include an estimate of the consistency of inter-observer agreement and a test of the underlying assumption of homogeneous variances required by the use of the t-test. Third, the results of the t-tests employed to test the experimental hypothesis will be presented.

Analysis of Information Test Scores

It will be recalled that a screening questionnaire was administered to students in general psychology classes in order to determine the amount of information they possessed concerning the experimental tasks. This questionnaire contained two sub-tests - each relevant to one of the tasks. Naive subjects were selected on the basis of their having obtained a low score (essentially chance) on this test (see p. 29). Expert subjects were selected on the basis of membership in populations presumed to be knowledgeable about the experimental tasks. As a check on
their assumed lack of knowledge about the other experimental problem, the appropriate subtest of the screening questionnaire was administered to each expert after he had performed as a non-expert.

One of the subtests was administered to two members of each group at the conclusion of their experimental session. Both the naive subject and the non-expert in each group took the subtest appropriate for the task they had just completed. A comparison of the post-test scores of the naive subjects with their pre-test scores permitted an evaluation of what naive subjects learned about the task during mutual problem solution. A comparison of the scores of the non-experts with the post-test scores of the naive subjects made available a check on the assumed lack of knowledge of the non-experts about the task on which they had just performed. The results obtained on the various tests administrations are shown in Table II.

A comparison of the naive subjects' post-test scores with their pre-test performance showed that there was no increase in post-test scores for the statistics task. On the other hand, those naive subjects who performed on the electronics task did show a significant increase in their post-test scores. Comparisons of the mean test scores of $S_e$ and $E_e$ with the post-test scores
Table II

Means and Standard Deviations for Information

*Test Scores*

<table>
<thead>
<tr>
<th>Subject Classification</th>
<th>Pre-test</th>
<th></th>
<th>Post-test</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>$\sigma$</td>
<td>Mean</td>
<td>$\sigma$</td>
</tr>
<tr>
<td>$N_s$</td>
<td>2.25</td>
<td>1.36</td>
<td>4.58</td>
<td>1.93</td>
</tr>
<tr>
<td>$N_e$</td>
<td>2.25</td>
<td>1.05</td>
<td>3.25</td>
<td>1.55</td>
</tr>
<tr>
<td>$S_e$</td>
<td>-----</td>
<td>-----</td>
<td>5.91</td>
<td>2.12</td>
</tr>
<tr>
<td>$E_s$</td>
<td>-----</td>
<td>-----</td>
<td>3.64</td>
<td>1.75</td>
</tr>
</tbody>
</table>

*Two subjects (one $S_e$ and one $E_s$) were inadvertently given the wrong test. As a result, the figures for these classes are based on $n = 11$. For all other classes, $n = 12$.

†These symbols will be used hereafter in identifying the various classes of subjects. The capital letter stands for the classification with respect to knowledge and the lower case letter represents the task performed. Thus, for example:

- $N_e$ - naive subjects performing on the electronics task
- $E_e$ - electronics experts performing on the statistics task
- $E_s$ - electronics experts performing on the electronics task

of $N_e$ and $N_s$ respectively, showed there were no significant differences. This confirms the assumption that subjects selected as experts on one of the experimental tasks were naive with respect to their knowledge of the other. The t-tests on which these comparisons are based are shown in Table III.
Table III

Results of Comparisons of Mean Differences on Information Test Scores

<table>
<thead>
<tr>
<th></th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post- vs pre-test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$N_s$</td>
<td>1.69</td>
<td>.10</td>
</tr>
<tr>
<td>$N_e$</td>
<td>3.15</td>
<td>.001</td>
</tr>
<tr>
<td>Post-test comparisons</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$N_s$ vs $E_s$</td>
<td>1.49</td>
<td>.10</td>
</tr>
<tr>
<td>$N_e$ vs $S_e$</td>
<td>.54</td>
<td>.60</td>
</tr>
</tbody>
</table>

Measurement of the Dependent Variable

Reliability of observations

The consistency of inter-observer agreement was estimated by the intra-class correlation coefficient, $r'$ (19, p. 230 ff). The calculation of the intra-class correlation is shown in Table IV. A previous study (14) had shown inter-observer consistency to be satisfactory, as indicated by an over-all correlation of .83 obtained when three observers were used at each session. In that study, groups contained four subjects who were free to move about as they wished in the laboratory.
Table IV

Intra-class Correlation of Tallies of Attempted Leadership Acts by the Observers

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>F</th>
<th>r'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between pairs</td>
<td>17,642.22</td>
<td>68</td>
<td>50.28*</td>
<td>.96</td>
</tr>
<tr>
<td>Within pairs</td>
<td>356.00</td>
<td>69</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at the .001 level

The increase in the extent of agreement among observers obtained in the present study can probably be attributed to their increased experience in observing attempted leadership acts and to the more favorable conditions for observation which prevailed in this experiment. There were only three subjects to be observed in each group this time, and their movements occurred in a limited area of the laboratory. In addition, the subjects were always directly facing the observers, which was not true in the previous experiment.

Such a high degree of agreement among observers indicates that the attempted leadership act can be reliably observed. This is true even though the composition of the pairs of observers varied through the sessions. Of the three individuals who participated as observers, one was present at 23 of the 24 experimental
sessions, another was present at 21 of them, while the third took part at four of the sessions. Thus it appears that there is little variation associated with individual differences among observers.

The data

The statistical test of the hypothesis under investigation involved comparisons of the differences between mean number of attempted leadership acts, by means of the t-test, for the various classes of subjects. This test assumes homogeneity of the variances associated with the means. An analysis of the subjects' scores (the sum of the number of attempted leadership acts recorded by the two observers for each subject) indicated that the variances were heterogeneous. Consequently it was necessary to transform the scores in order to achieve homogeneous variances.

Mosteller and Bush (21, p. 326) state that an appropriate variance-stabilizing transformation for data consisting of the number of events occurring in a fixed time exposure is the square root transformation. The square roots of the sum of the observers' tallies for each subject were found, and the resulting transformed scores were tested for homogeneity of variances by means of Bartlett's test (10, pp. 195-197). Table V gives the means, variances, and standard errors of the means of the transformed scores for the six
Table V

Means, Variances, and Standard Errors of
the Means for the Six Classes of Subjects

<table>
<thead>
<tr>
<th>Class</th>
<th>Mean</th>
<th>Variance</th>
<th>Standard Error of Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>E_e</td>
<td>6.58</td>
<td>1.44</td>
<td>.36</td>
</tr>
<tr>
<td>E_s</td>
<td>3.76</td>
<td>.94</td>
<td>.29</td>
</tr>
<tr>
<td>S_s</td>
<td>6.09</td>
<td>5.20</td>
<td>.69</td>
</tr>
<tr>
<td>S_e</td>
<td>4.00</td>
<td>3.24</td>
<td>.54</td>
</tr>
<tr>
<td>N_s</td>
<td>2.71</td>
<td>2.00</td>
<td>.42</td>
</tr>
<tr>
<td>N_e</td>
<td>1.47</td>
<td>1.65</td>
<td>.39</td>
</tr>
</tbody>
</table>

*It should be noted that the E_e and E_s classes consist of the same twelve persons. Another twelve persons comprise both the S_s and S_e classes. On the other hand, the N_s and N_e classes are each made up of twelve different persons.

classes of subjects. The Bartlett's test, presented in Table VI, shows that the variances of the transformed scores are homogeneous. These transformed scores were used in all the succeeding analyses of attempted leadership acts.

Analysis of Attempted Leadership Act Scores

Having shown the data are in a form necessary to meet the assumptions of the statistical test, it was possible to proceed with the...
Table VI

Bartlett's Test for Homogeneity of Variances
among the Six Classes of Subjects

<table>
<thead>
<tr>
<th>Class</th>
<th>n</th>
<th>df</th>
<th>Variance</th>
<th>log Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>$E_e$</td>
<td>12</td>
<td>11</td>
<td>1.44</td>
<td>0.15836</td>
</tr>
<tr>
<td>$E_s$</td>
<td>12</td>
<td>11</td>
<td>0.94</td>
<td>-1.97313</td>
</tr>
<tr>
<td>$S_s$</td>
<td>12</td>
<td>11</td>
<td>5.20</td>
<td>0.71600</td>
</tr>
<tr>
<td>$S_e$</td>
<td>12</td>
<td>11</td>
<td>3.24</td>
<td>0.51055</td>
</tr>
<tr>
<td>$N_s$</td>
<td>12</td>
<td>11</td>
<td>2.00</td>
<td>0.30103</td>
</tr>
<tr>
<td>$N_e$</td>
<td>12</td>
<td>11</td>
<td>1.65</td>
<td>0.21748</td>
</tr>
</tbody>
</table>

Sum  14.47  1.87655

Chi-squared = 10.21  P greater than .05

comparisons of mean differences among the various classes of subjects so as to test the hypothesis. There are fifteen possible comparisons among the six classes of subjects included in the experiment. Table VII shows the predictions, based upon the hypothesis, made about the relationships among the means.

In every instance, it is predicted that experts performing upon their appropriate task will attempt to lead more often than all
Table VII

Predictions of the Relationships among Mean Number of Attempted Leadership Acts for the Six Classes of Subjects

<table>
<thead>
<tr>
<th>Means Predicted Unequal</th>
<th>Means Predicted Equal</th>
</tr>
</thead>
<tbody>
<tr>
<td>$E_e$ greater than $E_s$</td>
<td>$E_e = S_s$</td>
</tr>
<tr>
<td>$E_e$ &quot; &quot; $S_e$</td>
<td>$S_e = E_s$</td>
</tr>
<tr>
<td>$E_e$ &quot; &quot; $N_e$</td>
<td>$E_s = N_s$</td>
</tr>
<tr>
<td>$E_e$ &quot; &quot; $N_s$</td>
<td>$S_e = N_s$</td>
</tr>
<tr>
<td>$S_s$ &quot; &quot; $S_e$</td>
<td>$E_s = N_e$</td>
</tr>
<tr>
<td>$S_s$ &quot; &quot; $E_s$</td>
<td>$S_e = N_e$</td>
</tr>
<tr>
<td>$S_s$ &quot; &quot; $N_s$</td>
<td>$N_s = N_e$</td>
</tr>
<tr>
<td>$S_s$ &quot; &quot; $N_e$</td>
<td></td>
</tr>
</tbody>
</table>

other classes of subjects. This includes the comparison of experts' scores when they are performing in the capacity of non-experts. Thus a differential prediction about the number of attempts to lead is made for the same individual performing under different conditions. On the other hand, when the two classes of experts are compared with each other, it is predicted that the mean number of attempted leadership acts for the two classes will be equal. Likewise when the two classes of non-experts are compared, equality of means is predicted.
In the case of all comparisons between non-experts and naive subjects, equality of means is predicted.

These predictions were borne out in all instances except for the last three comparisons in which equality was predicted, i.e., the comparisons of $N_e$ with $E_s$, $S_e$, and $N_s$. The t-tests of the mean differences are shown in Table VIII. The $E_e$ vs $E_s$ and $S_e$ vs $S_s$ comparisons are made on the basis of using each subject as his own control, i.e., a test of mean difference for paired groups, with $n = 12$ and $df = 11$. All other comparisons are for independent samples with $n_1 = 12$, $n_2 = 12$, and $df = 22$.

Table VIII

Tests of the Differences among the Mean Number of Attempted Leadership Acts for the Six Classes of Subjects

<table>
<thead>
<tr>
<th>Predicted Unequal</th>
<th>Predicted Equal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$t$</td>
</tr>
<tr>
<td>$E_e$ vs $E_s$</td>
<td>8.06</td>
</tr>
<tr>
<td>$E_e$ vs $S_e$</td>
<td>3.97</td>
</tr>
<tr>
<td>$E_e$ vs $N_e$</td>
<td>9.64</td>
</tr>
<tr>
<td>$E_e$ vs $N_s$</td>
<td>7.04</td>
</tr>
<tr>
<td>$S_s$ vs $S_e$</td>
<td>3.59</td>
</tr>
<tr>
<td>$S_s$ vs $E_s$</td>
<td>3.11</td>
</tr>
<tr>
<td>$S_s$ vs $N_s$</td>
<td>4.17</td>
</tr>
<tr>
<td>$S_s$ vs $N_e$</td>
<td>5.85</td>
</tr>
</tbody>
</table>
Discussion of Results

The hypothesis tested in this study is clearly supported by the results of the experiment. The only deviations from the fifteen predictions shown in Table VII were found in comparing \( N_e \) with \( E_e, S_e, \) and \( N_s \). No differences were predicted for these comparisons, but significant differences were obtained. Let us now examine the three of the fifteen comparisons in which the hypothesized relationships were not found to hold.

The three negative findings involved comparisons of the naive subjects who performed on the electronics task \( (N_e) \) with the performance of (1) non-experts on the electronics task \( (S_e) \) and (2) the performance of non-experts and naive subjects on the statistics task \( (E_s \) and \( N_s) \). In the first of these cases, if we consider only those non-experts on the electronics problem who performed on that task as their first experimental task we obtain a mean of 3.15. A comparison of this value with the mean of \( N_e \) yields \( t = 1.75 \) with \( df = 16 \). For this value of \( t \), \( P = .10 \), indicating that there is no significant difference between \( N_e \) and \( S_e \) in number of attempted leadership acts when these individuals are performing on the electronics task as their first experimental session. The significant difference obtained when all members of these two classes are compared is due presumably to the fact that half of the \( S_e \) subjects were more familiar with the experi-
mental situation than were the $N_e$ subjects.

The differences found between $N_e$ and both $E_s$ and $N_s$ can probably be attributed to differences in the nature of the two tasks. The electronics task requires a knowledge of electronics symbols, electronic components, and the electrical color code. Without such knowledge, which cannot be assimilated in a few minutes, no meaningful performance is possible. The statistics task, however, is not quite as stringent in its demands. This task requires the manipulation of numbers—a very familiar, highly overlearned kind of behavior for these subjects. It also requires construction of a histogram and an ogive—activities which permit, to some extent, the application of general principles of table building and curve construction. The knowledge of such principles was quite likely to be available to the electronics experts, since most of them had some college background in engineering. These differences in (1) the characteristics of the two tasks and (2) the subjects' initial familiarity with their characteristics offer the most plausible basis for the obtained differences in number of attempted leadership acts between $N_e$ and both $E_s$ and $N_s$.

The over-all results of the experiment clearly support the hypothesis. This is most evident when we consider the results of the available comparisons among the two groups of experts (remembering that each group also serves as non-experts on the other experimental
task). Here we find that (1) individuals attempt to lead more often in their capacity as experts than when they themselves occupy the role of non-expert, i.e., $E_e$ is greater than $E_s$ and $S_e$ is greater than $S_s$, and (2) there is no difference in number of attempts to lead when comparing the two groups of individuals in their roles as experts ($E_e = S_e$), or in their roles as non-experts ($E_s = S_s$). This completely consistent set of findings provides the strongest possible support for the hypothesis.

Having determined that the exclusive possession of expert knowledge about a mutual problem results in an increased number of attempts to lead, we may now consider some informal observations that contribute to our understanding of this effect. These observations are based on the recordings of the sessions and notes made by the experimenter. The most common sequence of events once a session got underway went as follows:

1. The expert was identified either in response to a question about who knows how to do the job or by some comment such as, "This is right up my alley."

2. There was a lecture--of widely varying quality--by the expert on how to do the job. Sometimes this was the means by which the expert was identified.

3. The group began the solution of the problem.
Once the expert was identified, it became apparent that the group's progress would depend largely upon his contribution to its efforts. This seemed to motivate him immediately to initiate problem solution. His motivation in this respect was reinforced by a tacit conferring of status upon him by the other group members. The net effect of these rapid stages in the development of the group's interaction is to differentiate the expert from other members of the group. This in turn completed the circle by serving as an additional motivating source resulting in attempts to lead. These informal observations tend to support other aspects of the theory from which the hypothesis was drawn (see 13, pp. A-31 to A-32).

The effect of possession of information depends upon the extent of such possession however. If an individual possesses only a little knowledge, this does not suffice to motivate him to attempt to lead. Such was the case in the Hemphill, et al., (14) experiment in which possession of information did not affect attempts to lead. A more adequate statement of the relationship between knowledge and attempted leadership acts would specify that possession of expert knowledge motivates a person to attempt to lead. This is congruent with the statement above that the expert felt that any progress to be made by his group would depend primarily upon his contributions to problem solution. This restatement of the relationship between
knowledge and attempted leadership acts is consistent also with the finding of the Hemphill, et al. experiment.
CHAPTER IV

SUMMARY AND CONCLUSIONS

Summary of Procedures

This study tested the hypothesis, drawn from Hemphill's tentative theory of leadership in small groups, that the exclusive possession of information relevant to a mutual problem will result in a greater number of attempts to lead during the course of mutual problem solution. Three-man groups performed on two experimental problems--an electronics assembly task and a statistics task.

Each group was composed as follows:

(1) an individual who was expert on the group's present task but who was inexperienced on the other task in the experiment (the "expert" subject)

(2) an individual who was inexperienced on the group's present task but who was an expert on the other experimental problem (the "non-expert" subject)

(3) an individual who was inexperienced on both tasks in the experiment (the "naive" subject).

The subjects in categories 1 and 2 performed in two sessions, once on each task in counterbalanced order. The naive subjects participated in only one experimental session.
The naive subjects were selected on the basis of scoring at a chance level on a test of their knowledge about the experimental tasks. Expert subjects were selected on the basis of membership in populations presumed to be knowledgeable about the experimental tasks. The appropriate subtest on the screening instrument was administered to the naive and non-expert members of each group at the conclusion of their experimental session. Attempted leadership acts, as defined by the Observer's Manual presented in Appendix A, were tallied by two trained observers working behind one-way vision mirrors.

Summary of Results

Inter-observer agreement was satisfactorily high as indicated by an intra-class correlation coefficient of .96. Results of the analysis of scores on the information test indicated that experimental controls with respect to possession of information were maintained throughout the experiment.

Analysis of the transformed attempted leadership scores supported the hypothesis under examination. Of the fifteen possible comparisons among the six classes of subjects, the hypothesized relationships were found to hold in twelve instances. The three deviations from predicted results were accounted for in terms of
(1) differences between the characteristics of the two experimental tasks and (2) differences in familiarity with the experimental situation.

Conclusions

The principal conclusions drawn from the results of the experiment may be summarized as follows:

1. Exclusive possession of expert knowledge about a mutual problem results in a greater number of attempts to lead.

2. The effect of exclusive possession of expert knowledge is to secure status within his group for an individual and to differentiate him from other group members.

3. Observers can make reliable observations of attempted leadership acts. There is little variation associated with individual differences among observers.
APPENDIX A

OBSERVER'S MANUAL
OBSERVER'S MANUAL

I. Physical Setting and Location of Observers

The training and experimental sessions will be held in a small group laboratory, equipped with a microphone (not concealed) and with a one-way vision mirror at each end. This laboratory is a large room containing tables and chairs. The observers, located behind one-way vision screens, will be able to watch the performance of the groups as well as to hear their conversations.

II. The Behavioral Classification System

A. Introduction

The behavior to be observed and tabulated during the experimental sessions is classified into a single major category called "attempted leadership acts." All other behavior may be viewed as falling into a category labelled "not in the system" and of concern to the observers only as it provides a context for attempted acts of leadership. The purposes of this section of the manual are as follows: (1) to specify and to illustrate the procedures by which the observer is to identify attempted leadership acts; (2) to identify and to describe those acts which are clearly excluded from the system; and (3) to provide procedures for categorizing "marginal" acts (i.e., those whose classification depends upon relatively complicated inferences on the part of the observer).
B. The Category of Attempted Leadership Acts

1. Definition of the Act

Attempted leadership acts are defined as acts accompanied by an intention to initiate structure-in-interaction during the process of mutual problem solution. Another way to express this is to say that the individual who attempts to lead is trying to set the form by which the group may attempt to solve its problem. He is proposing a rule of organization, or a procedure, or a technique, or a consistent pattern of behavior for a group to follow in the process of solving a mutual problem. Such a proposal would introduce a restriction upon the freedom of interaction of the group members in that, if accepted, it would involve following one specified course of action and not some other. Whether or not the individual member's attempted act of leadership actually is accepted or followed by the group is irrelevant, as is the question of whether, if followed, his attempted leadership act would in fact lead to a correct solution to the problem.

From the above definition a set of three necessary characteristics may be derived. For an act to be classified as an attempted leadership act, it is required that it conform to all three of these specifications: (1) that the act be characterized by an intent to initiate, i.e., to bring about a change or modification; (2) that such a change, modification, or innovation would pertain specifically to a structure-in-interaction, i.e., would propose a consistent pat-
tern for the activity of more than one individual; (3) that the act occur during the process of solving a mutual problem, i.e., one requiring for its solution action on the part of all group members.

These stipulations denote the specific characteristics of that "intent" which accompanies a special type of act - the attempted leadership act. In general, an intent is defined as "a projected state of affairs to be realized at a future time." The stated definition of the attempted leadership act describes the state of affairs toward which this kind of act is oriented, (i.e., toward a modification of the present mode of operation of a group engaged in solving a mutual problem) and which distinguishes it from acts accompanied by different intents.

2. Classification Procedure

a. Tallying Rules

(1) Use of tally sheet: Each observer will be provided with a tally sheet on which to make separate tabulations of the attempted leadership acts of each member of a group during each session. As soon as he has noted an attempted leadership act, the observer is to make a tally mark beside the appropriate code label that identifies the group member according to the color of coat he wears during the session.

(2) Size of unit: An uninterrupted statement by
one individual is to be tabulated as one act. This is the case even if
the statement contains a set of directions or suggestions, rather
than a single specific proposal. For example, such a statement as
the following would be counted as a single attempted leadership act:
"You put your peg here; I'll put mine here; then you two put yours
here, and here." Another such act might be stated in this way:
"Let's divide into pairs, and while one pair is sorting these parts,
the other can be studying the diagram."

Conversely, if a group member is interrupted
after stating part of a plan and then, following the interpolated com­
ment, continues to develop the same proposal, each of the two
remarks is to be construed as a separate attempt to lead. Example:

Blue: "Look, put a peg here and one here, and
then - "

White: "But, what about - "

Blue: "Let me finish - and then put the other two here
and here."

Two attempted leadership acts are to be scored for Blue.

(3) Scoring repetitions: If the same suggestion
is repeated by the same group member with one or more intervening
remarks by another group member, the repetition is counted as an
additional attempted leadership act.
b. Criteria of Eligibility

(1) The design of this experiment restricts the observer to consideration of those acts which are given as oral statements.

(2) Only statements made by group members and addressed to group members are to be considered. Remarks made by or addressed to the experimenter, or any other outsider, are excluded from consideration.

(3) To be eligible for possible classification as attempted leadership acts, statements must be given in the imperative mood. Such statements are those which the observer infers to constitute for the group members, orders, suggestions, commands, recommendations, directives, or proposals.

c. Delimiting Conditions

The above criteria serve to identify the general class of behavior under which attempted leadership acts are subsumed. If a statement conforms to these criteria under the further conditions that all three requirements imposed by the definition of the attempted leadership act are met, then it is to be tabulated as an attempt to lead. In brief, remarks of the following kind are to be scored: imperative statements that describe or specify a change in the immediately present mode of operation of the group members during the
process of mutual problem solution. Any other statements are not to be scored.

In order to clarify the application of these requirements from the point of view of the observer, each of these three restrictions now will be considered separately:

(1) Condition 1: The attempted leadership act must be accompanied by an intent to initiate.

The presence of such an intent cannot be observed directly, but must be inferred by the observer. He will base his inference upon cues of the following kinds: (1) the content and form of the statement, (2) the intonation and manner of the person who makes the remark, and (3) the way in which the statement fits into, or makes sense in, a sequence of verbal behaviors.

The observer will depend on these kinds of cues for his answer to this question: Does this statement both describe and recommend the adoption of something new (i.e., different from the way things are now)? If the statement is explicitly imperative in form, it will be clear that a proposal has been made (e.g., "Let us -", "Do this!", "I suggest that we -"). Some other statements which are not explicitly imperative may, however, be inferred to operate in context as imperatives. (See section on marginal cases.) In such cases the observer's judgment will be based upon whether the remark is deliv-
ered in a confident, rather than a hesitant tone, and whether it seems
to be received by the group members as a proposal. If the statement
is ignored by the other group members, then the observer must rely
for his inference about its apparent intent upon the form, content,
and delivery of the statement itself and upon his observation of the
preceding events of the session. In general, the observer is permit­
ted to use any other cues provided by his observation of the behavior
of the speaker and the other group members that will, in his view,
enable him to decide whether a particular statement is characterized
by an intent to initiate. Examples:

Pink: "How should we go about this?"

White: "Well, suppose you put your peg there

and Blue puts his here. Grey could put his

there, and I'll put mine here."

Blue: "Well, okay, if it's all right with the others,

it suits me."

(White's statement can be inferred to show an intent to ini­
tiate. Because it conforms to this and the other two conditions, it
would be tabulated as an attempted leadership act.)

"Hand me a dowel."

"Look for a part like this."

"Hold this, while I tie the corners."
(2) **Condition 2:** The change recommended must refer to a structure-in-interaction.

In other words, the specific object of the intent is to propose a certain modification in what goes on between two or more persons. This is in contrast to a proposal to modify the speaker's own behavior if it has no consequence for the action of any other group member, or to introduce a change in the physical environment itself. An attempted leadership act may be addressed to only one other member or to all group members. In either case the statement would have implications for the subsequent interaction of all members of the group. Examples:

"I suggest that we divide up so that two of us can sort the parts, while the other two study the diagram."

"Look, Blue, why don't you help me with this."

"Hold on, everybody. Let's talk this over, before we make a move."

"Will you check on this, White, while I try to find that other part."

In all these examples a pattern, a procedure, or a way of organizing what two or more people do together is proposed.
Presumably, knowledge of any one of these acts would contribute to the observer's ability to predict the events that follow it.

(3) **Condition 3: The act must occur as a part of the process of mutual problem solution.**

Although an attempt to lead need not be task-oriented in a narrow sense, it is necessary that the observer be able to see it as relevant to the group members' efforts to solve a mutual problem. For instance, suggestions or recommendations which have to do with defining the relationships among group members and which can be broadly conceived as relevant to their problem-solving activity, are to be considered attempted leadership acts. Other attempted leadership acts might propose, irrespective of the particular task, a general procedure or system of organization for the group. **Examples:**

"Let's stop this arguing among ourselves and get down to business."

"I suggest that we choose one man as chairman and then let him do the planning."

"Keep quiet, while I study this a minute."

"Look, let's be democratic about this."

d. **Illustrative Subcategories**

During the course of the problem-solving process, structure may be introduced into the group interaction in any of a var-
iety of ways. Therefore, attempted leadership acts may be divided into subcategories according to the different means by which statements propose to bring about structure. In the present experiment the observer is not expected to make such distinctions. It may, however, help him to develop an appropriate set toward his own task to keep in mind the following illustrative, but not exhaustive classification.

Attempted leadership acts may consist of proposals for any of the following kinds of structures-in-interaction:

a. Division of labor
b. Delegation of responsibility
c. Coordination of functions
d. Mobilization of resources and facilities

C. Behavior Excluded from the System

1. Criteria for Excluding Behavior

a. Behaviors that fail to meet one or more of the three eligibility criteria are excluded from consideration as attempted leadership acts. Therefore, the following behaviors are eliminated at the outset:

(1) Non-verbal behavior.

(2) Statements made by or addressed to any other than group members.
(3) Statements not given in the imperative mood.

b. It follows that behavior excluded on these grounds would also fail to conform to one or more of the three special requirements derived from the definition of the attempted leadership act. Failure to meet any one of the three conditions disqualifies a statement from being classed as an attempted leadership act.

2. Illustrations of Behavior Excluded from the System

a. **Signals**: A statement that the observer interprets as having the characteristics only of a signal is not to be considered an attempted leadership act. In such an instance the preceding group interaction would indicate that a course of action had already been agreed upon, and the signal would be given now simply as a cue to the group to put it into effect. For example: "Okay. Begin"! or, "Time's up. Stop." The observer's judgment as to whether a statement is a signal rather than an attempt to lead will depend upon his inference as to whether an intention to initiate structure is present. That is, a signal refers only to a pre-arranged structure, but an attempted leadership act extends beyond this to propose additional limits or conditions for succeeding events.

b. **Task analysis statements**: This is another category of statements not to be counted as attempted leadership acts. The critical distinction again depends on whether the observer con-
siders that the group member intends by his act to initiate structure in the group. Analytic remarks may analyze or diagnose the problem, or criticize a present or possible procedure. But unless, in addition, the observer infers that a proposal for subsequent action is made, task analysis statements are not to be scored. Examples:

"This way of going about finding the answers won't work."

"It's taking a long time. We may not finish in time."

"If we put our pegs there, then he will block us on the next move."

Some task analysis statements describe a set of alternatives for action. Such statements are not scored, however, simply by reason of the implication that the action to be followed should be chosen from this restricted set of alternatives. A description of alternatives is not sufficient; without a recommendation for action the remark is not to be classified as an attempt to lead. Examples:

"Well, we could put two pegs here and two here, or we could put all four over here instead."

"We could build this on the table, or we
could construct it on the floor."

"Well, it's possible to do this either one of two ways - "

c. Expressions of attitudes or feelings: These statements are those that express positive or negative feelings toward a proposal, an individual member, or toward the group. Remarks reflecting agreement or disagreement, support or rejection, affection or hostility, are included. Examples:

"That's a good idea."

"I don't agree with you at all."

"Now we're getting somewhere."

d. Information giving or requests for information: Such statements might be directed toward one person or toward the group. As in the case of task analysis statements, information giving remarks are not to be scored simply because the information provided may influence subsequent interaction. Unless a proposal for implementing this information is included the remark is not scored. Examples:

"What part fits this one?"

"These are the bracing dowels."

e. Requests for suggestions or structuring: This kind of statement might be interpreted as an attempt to elicit leader-
ship acts. Examples:

"What do I do now?"

"How should we begin?"

f. Proposals to accept or reject previous attempts to lead: A proposal to reject an attempted leadership act is not in itself to be construed as an attempt to lead, unless an alternative is explicitly proposed. Conversely, neither is a proposal to accept the suggestion made by another to be scored as an attempted leadership act. In both instances, such proposals are excluded because they fail to introduce or to initiate a new or different structure-in-interaction. Examples:

"No, let's not do that."

"Let's do as he says."

g. Acts that may be relevant to individual problems or needs, but are not relevant to the solution of the mutual problem: Included here would be the release of tension that seems to be unrelated to the problem solving activity of the group. Also included is the extreme case in which the group might simply withdraw from the situation, and ignore the assigned task. Examples:

"Gosh, I'm worried about that exam tomorrow."

Or the telling of jokes, or discussion of various
topics and issues that are irrelevant to the mutual problem.

D. Marginal Cases

The purpose of this section is to provide the observer with procedures for dealing with the special problems of inference presented by borderline cases. These are acts that are not so easily and immediately classifiable as attempted leadership acts, or as behavior clearly excluded from the system. Nevertheless, the observer must make a quick judgment as to whether the requirements of attempted leadership acts are met, but at a more implicit level.

1. Conventional Remarks: Because of the pressure in our culture toward operating "democratically" in a group, it frequently will be the case that a legitimate attempt at leadership will be phrased overtly in the form of either an interrogative or a declarative statement. Nevertheless, the statement may have imperative force. These more subtle and conventional attempts to lead may occur more often at the beginning of a session or early in the acquaintance of the group members. The observer must judge whether such remarks are implicitly imperative and do appear to represent an intention to initiate structure. If so, the statements are to be scored.

For example, attempted leadership acts worded as
questions may begin with such clauses as the following:

"Do you want to ---?"

"What would happen if---?"

"Why don't we---?"

"Shall we---?"

Declarative statements that in context may be interpreted as attempts to lead may be introduced in the following ways:

"We'll have to ---"

"I think we'd better---"

"It seems to me that we should---"

"We can do it this way---"

2. Personal Mannerisms: Some statements that recur frequently are more correctly to be interpreted as personal mannerisms of the particular individual, than as attempts to lead. For example: "Let's see now," or, "Wait a minute." The observer must make the judgment as to whether the suggestion is addressed to the group members and intended as an attempt to initiate structure, or whether it simply is a preoccupied reminder that the speaker directs toward himself. If the observer decides that the statement is an example of the first kind, he is to score it; if he infers that it is a personal mannerism, he is not to score it.
3. **Statements in the First Person Singular:** In some instances a group member's statement of what he himself is going to do can be interpreted as an attempted leadership act. Presumably, this would be more apt to occur in groups working on some types of tasks than on others. The observer must apply two criteria in deciding how to classify such statements: whether there is evidence that the group member's self declarative remark has restrictive consequences for the problem solving behavior of the rest of the group, and whether his other behavior is consistent with the hypothesis that his statement as to what he himself plans to do is an attempt to establish the pattern of the group's activity. If these requirements are met, then the observer would infer that an intent to lead was present.

**Examples:**

"I know what the effective strategies are in this game, and I understand the rules. Therefore, I suggest that I be the one to place each of the pegs in position."

"I'll put my peg here, and that will make it possible for us to build out in two directions."

"I'll work on assembling the wings of the airplane."

Conceivably, certain tasks might be so structured that a sequential procedure is necessary for solution, and that when
one group member's move is determined, those of the others must follow from it. In that case, a single member's announced intention as to his own procedure would correctly be taken as an attempt to structure the interaction of the group.

4. Confounding of Categories

In the actual operations of a group it often will be the case that a remark may have characteristics both of an act excluded from the system and of an attempted leadership act. For example, a remark may be neither purely task-analytic nor purely interaction initiating. If, however, the latter component is present, and an explicit proposal is made, then the statement meets the requirements of attempted leadership. This same general rule would apply in the instance referred to earlier in which a statement proposes a rejection of an attempt to lead. If an alternative plan is proposed as a substitute for the one rejected, then the remark is to be scored.

Examples:

"I don't think this strategy is going to work very well. Let's do it this way instead, etc."

"I've seen this kind of problem before, and the best way to solve it is, etc... Let's try it."

"The bracing dowels go here and here."
Will you and Blue fasten them, while I finish this part."

"No, that's not the best way to do it.

Let's put our pegs here instead."

To summarize briefly: In some cases the remarks of the group members will clearly and explicitly fall within the category of acts that specify proposals for structuring the group interactions. In other cases the observer will have to rely more heavily on his own inferences from the context (i.e., the events preceding and following the act) as to whether the requirements of attempted leadership are met. In all instances the observer's procedure in determining the presence of an intent to initiate structure-in-interaction will be one of drawing the inference that seems to him most accurate in the light of his continuing observation of the problem solving process.
APPENDIX B

SUBJECT SCREENING QUESTIONNAIRE
Biographical Information

Name ___________________________ Home Address ___________________________

Columbus Address ___________________ Telephone Number ___________

College _________ Year _________ Major _________ Minor _________

Date of first registration at Ohio State: Quarter _______ Year _______

Approx. average in high school _________ Fraternity __________

Psychology 401 hour of meeting _________ Instructor __________

Height ________ Weight _________ Race _________ Age _________

Military Service: Dates _________ Branch ______ & Rank _______

In the following schedule put an X for hours in which you are in class, and an O for the hours which you spend in part-time work if any.

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Directions: All of the following items are multiple choice. For each item encircle the letter to the left of that statement which corresponds to the correct answer. There is only one best answer to each item.

1. The symbol found on a schematic diagram which represents a condenser is:
   a. 
   b. 
   c. 
   d. 

2. Observe the following schematic diagram:
   It consists of:
   a. three fixed condensers and a fixed resistor and a coil
   b. three fixed resistors, a variable condenser and a fixed condenser
   c. a variable resistor, a fixed resistor and three fixed condensers
   d. three coils, a variable condenser and a fixed condenser.

3. The three bands on a resistor are red, green, and yellow in color. Its value is:
   a. 35 K
   b. 2400
   c. 250 K
   d. 460

4. The working voltage of a paper condenser is:
   a. clearly indicated on the outside of the condenser
   b. is always 600 V. D. C.
   c. never given directly
   d. color added
5. A condenser has a value of .002 mfd. This is equivalent to:
   a. 2000 mmfd.
   b. 200 mmfd.
   c. .2 mmfd.
   d. .00002 mmfd.

6. Which of the following is the symbol for a switch on a schematic diagram?
   a. 
   b. 
   c. 
   d. 

7. How many connections may be made to a variable resistor?
   a. one
   b. two
   c. three
   d. four

8. Which of the following designations of electrical current is incorrect?
   a. 110 V AC 50 cycles
   b. 220 V AC 60 cycles
   c. 100 V DC 60 cycles
   d. 6 V AC 60 cycles

9. Which of the following is the symbol found on a schematic diagram indicating a variable resistor?
   a. 
   b. 
   c. 
   d. 

10. Which of the following electronic parts has a rotating shaft?
   a. ceramic condenser  
   b. electrolytic condenser  
   c. antenna  
   d. variable condenser

11. When summarizing a set of data by arranging it in groups, the recommended number of groups (or intervals) is:
   a. 3-9  
   b. 10-20  
   c. 21-30  
   d. 31-40

12. The real limits of a measurement of a boy's height given as 68.3 inches is:
   a. 68.00-69.00 inches  
   b. 67.50-68.50 inches  
   c. 68.25-68.35 inches  
   d. 68.20-68.40 inches

13. The formula for the mean is:
   a. $\frac{\Sigma X}{N}$  
   b. $\frac{X}{N}$  
   c. $N\Sigma X$  
   d. $\frac{\Sigma(X-M)}{N}$

14. The following diagram is an example of a
   a. frequency plot  
   b. frequency polygon  
   c. cumulative frequency polygon  
   d. frequency polygraph

15. The following diagram is an example of a
   a. histamine  
   b. pictograph  
   c. histogram  
   d. histograph
16. Of the following procedures, the first step in preparing a frequency distribution is to:

   a. compute the mean of the measurements
   b. label all three axes of the figure
   c. prepare a scatter plot of the data
   d. determine the range of the measurements

17. The mean is a measure of:

   a. central tendency
   b. variability
   c. correlation
   d. scatter

18. The following distribution is said to be:

   ![Distribution Curve]

   a. negatively accelerated
   b. positively accelerated
   c. negatively skewed
   d. positively skewed

19. The total area under a distribution curve is:

   a. equal to unity
   b. dependent upon the number of cases
   c. not determinate
   d. equal to ten

20. The measure most subject to the influence of extreme values is the:

   a. median
   b. geometric mean
   c. harmonic mean
   d. arithmetic mean
APPENDIX C

MATERIALS RELATED TO THE EXPERIMENTAL TASKS

1. Inventory of parts for electronics task
2. Schematic diagram for electronics task
3. The data for the statistics problem
## Inventory of Parts for Electronics Assembly Task

### Condensers

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Schematic Diagram for Electronics Task
Listed Below are the Measurements of Height (in inches) of 80 Male High School Students from School A

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| 71.6 | 68.2 | 70.2 | 71.7 | 69.4 | 69.1 | 70.6 | 68.9 |
| 72.4 | 68.2 | 68.4 | 68.7 | 68.3 | 68.4 | 67.6 | 68.7 |
| 69.0 | 71.8 | 70.4 | 72.1 | 69.9 | 71.0 | 69.1 | 69.2 |
| 72.2 | 71.4 | 69.6 | 71.4 | 72.0 | 73.0 | 70.0 | 67.0 |
| 67.4 | 74.2 | 70.0 | 69.3 | 69.0 | 68.6 | 69.3 | 70.1 |
| 73.4 | 70.4 | 67.9 | 71.4 | 72.8 | 74.9 | 71.2 | 69.6 |
| 69.7 | 67.9 | 71.0 | 69.9 | 68.6 | 68.6 | 66.6 | 70.4 |
| 68.8 | 67.8 | 68.9 | 69.4 | 72.4 | 68.6 | 69.0 | 70.6 |
| 70.9 | 65.8 | 69.6 | 69.4 | 66.3 | 70.6 | 69.1 | 70.1 |
APPENDIX D

INSTRUCTIONS TO SUBJECTS
EXPERIMETER'S SCRIPT

INTRODUCTION

EXP: In order that all groups may get exactly the same instructions, I will be reading your instructions from this prepared script.

What you're to take part in is a study of the way groups work together. During the experiment, observers located behind this mirror will be listening to you and watching how you go about your work. For this purpose, we'd like you to identify each other by color during the experiment, so, to sort of get used to the idea, I'm going to ask you to put on these different colored lab coats. If you'll wear these and call each other by the color of your coats it will help us to keep our records straight during the experiment.

DIRECTIONS: EX-PASSES OUT LAB COATS AND WHILE S's ARE PUTTING THEM ON, SAYS...

EXP: It would be a good idea too - and this is important - to get used to speaking up clearly and distinctly so that the observers may hear you without difficulty.

As I said before, the purpose of this experiment is to find out more about how groups work together. You may or may not be familiar with the kind of problem your
group will work on, but we want you to try to do as well as you can. What we're mainly interested in though, is how you work together--not how well you do on the problem, so don't worry too much about that. Just try to do your best as a group.
ELECTRONICS PROBLEM

EXP: Now, for your problem. Your task is to use these salvaged parts to assemble an electronics circuit. The schematic diagram of the circuit is shown on this small piece of cardboard. You are to assemble the various components of this circuit in the assembly area - this large piece of cardboard - by selecting the correct part from these boxes and putting it in the appropriate square. You may find more parts of one kind than another. The lines connecting the squares are to be considered to be the wires which connect the components. All necessary parts can be found in these boxes. Your job will be to find the correct parts and to place them in the proper squares. You will have 30 minutes to complete the assembly from the time you are told to begin. You can keep track of the time by looking at this wall clock. Thirty minutes isn't much time to complete this job, so you'll have to work together pretty closely in order to do the job.

Please do not make any marks on the cardboard, and may I remind you to speak up loudly and distinctly at all times. Any questions? You may begin.

DIR: E STARTS CLOCK AND LEAVES THE ROOM.
STATISTICS PROBLEM

EXP: Now for your problem. This task involves the preparation of some summary statistical information based upon this set of data.

DIR: E PASSES OUT DATA SHEETS.

EXP: You have there a list of the heights of 80 high school students. Your job is to make up a histogram and an ogive, i.e., a cumulative frequency distribution, from these measurements. In addition, you are to calculate the value of the arithmetic mean of these data and indicate that value appropriately on both the ogive and the histogram. You may use the materials available here to complete the task - scrap paper, graph paper, colored pencils and so on. You will have 30 minutes to complete the job from the time you are told to begin. You can keep track of the time by looking at this wall clock. Do as neat and as accurate a job as possible. Thirty minutes isn't much time in which to make up a histogram, an ogive, and to compute the arithmetic mean so you'll have to work together pretty closely in order to do the job. Any questions? You may begin.

DIR: E STARTS CLOCK AND LEAVES THE ROOM.
APPENDIX E

THE EXPERIMENTAL DATA
### Transformed Attempted Leadership Scores for the Experimental Subjects

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AUTObIOGRAPHY

I, Reuben Nathan Shevitz, was born in Baltimore, Ohio, January 13, 1927. I received my secondary school education in the public schools of Baltimore. My undergraduate training was obtained at the University of Maryland, from which I received the degree Bachelor of Arts in 1950. I received the degree of Master of Arts in 1953 from the University of Maryland. While in residence at that school I served as Graduate Assistant to Professor Charles N. Cofer. In October, 1952 I received an appointment as Assistant in the Department of Psychology at the Ohio State University, where I specialized in the Department of Psychology. In the years 1953 - 1955 I was a Research Assistant and then Research Fellow at the Personnel Research Board Laboratory, Ohio State University.