LEADER EFFECTIVENESS AS A FUNCTION OF LEADER'S SEX AND LEADERSHIP STYLE

BY

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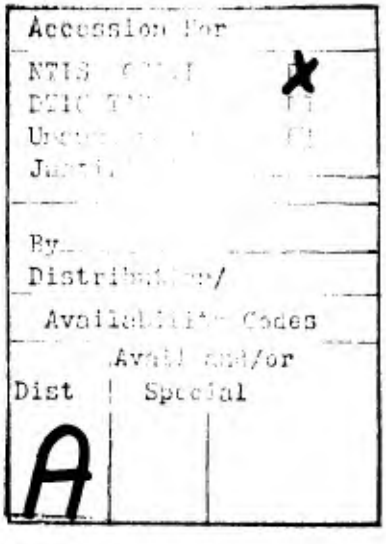
DEDICATION

To my family, Julie Dansby, Scott Dansby, and especially my wife, Diane Dansby, without whose support and understanding this dissertation may never have been written, and to the United States Air Force, without whose support this dissertation would most assuredly not have been written.



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LEADER EFFECTIVENESS AS A FUNCTION OF LEADER'S SEX AND LEADERSHIP STYLE

By

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Social scientists have long been interested in studying leadership and the effects of gender on performance and impressions. The emergence of women in leadership positions makes the study of these factors particularly important today. Although numerous social scientists have substantiated various sex-role stereotypes common to western society, little research has been conducted to see how these stereotypes may influence the effectiveness of the leader. Following Fiedler's contingency theory of leadership, leader effectiveness is considered to be the measure of group productivity or performance. Most research on sex stereotypes in leadership has concentrated either on follower impressions and attitudes or on cataloging differences in behavior between male and female leaders. In the present study, leader behavior was manipulated and follower impressions,

as well as the more practical outcome, leader effectiveness, were observed as functions of the leader's sex and leadership style.

A randomized blocks factorial experiment was conducted in which leader sex (male, female), leadership style (structuring, considerate), and task order (TV task first, word task first) were the independent variables, and time of participation (first week through eighth week) was the blocking factor. Instructions were used to manipulate leadership style; the TV task involved playing electronic TV games, and the word task involved making words from a given configuration of letters. Since the blocking factor was shown to have no effect, it was dropped from the experimental analysis. Subjects were 256 undergraduates, divided randomly into 64 groups of two males and two females each.

The 53 dependent variables for the experiment were analyzed in three theoretically relevant groups: effectiveness measures, group rating measures, and strategy measures. Because of the large number of dependent measures, multivariate analysis of variance was used to control the overall error rate for analyses within each of these groups. A priori hypotheses were stated and evaluated using the per comparison error rate.

The measure of leader effectiveness revealed only one multivariate effect: leadership style. Groups with structuring leaders performed better on the TV task than groups with considerate leaders. Predictions of effects for

leader sex and the sex X style interaction were not supported.

On the rating measures, there were significant multivariate effects for leadership style and task order. For structuring leaders, the group atmosphere was rated worse, the leader structure was rated greater, the leader consideration was rated lower, individual group member's performance was rated worse for the first task, leader power was rated higher, and the group members' enjoyment of the experiment was rated lower than for considerate leaders. For task order, there were significant univariate effects on the ratings of task dimension, performance, and attribution of individual responsibility for performance.

On the strategy measures, the only multivariate effect was for leadership style. Groups with structuring leaders used fewer players on the TV task, more word listers on the word task, more people to check words in the dictionary, more members in specific duties, fewer female TV players, and more male word listers, when compared to groups with considerate leaders. Other minor strategy differences were also observed.

Evaluation of a priori hypotheses presented some evidence of sex stereotyping. These stereotypes did not appear to affect leader effectiveness directly.

The results were seen as generally in accord with Fiedler's contingency theory. Caution was advised in

interpreting the relative lack of sex stereotype effects because such stereotypes may affect leadership in other settings and with different populations.

CHAPTER I

THE PROBLEM

Introduction

At least since the Golden Age of Greece, social analysts have been interested in both leadership and attribution of performance differences based on gender. Plato, for example, discussed the inheritance of a disposition toward leadership (Cornford, 1945, p. 107); Aristotle is reported to have concluded that woman is simply an inferior man (Goldberg, 1968). Despite the long history of interest in these two areas, relatively little research has been generated investigating sex effects on leadership processes in mixed-sex groups. For example, although social scientists have proposed that men and women should use different leadership styles because of their different roles in the family and society (Parsons & Bales, 1955), we have few empirical studies of the interaction between leader sex and leadership style. The Zeitgeist in modern western society makes it important for psychologists and other social scientists to study the effects of gender on leadership. Responding to this need, the work that has been done on sex effects in leadership is reviewed, and a report is presented

of an experiment designed fo further our understanding of how the leader's sex and style of leadership may influence group outcomes.

Stereotypes based on sex did not die with Aristotle. On the contrary, a number of contemporary investigators attest to the fact that sex stereotypes are a pervasive aspect of our society. For example, Goldberg (1968) found that female subjects rated scholarly articles attributed to male authors as more important than identical articles attributed to female authors. Schein (1973) had male middle managers describe characteristics of males, females, and successful middle managers, respectively. The descriptions of males and successful middle managers were positively correlated ($r = .62$, $p < .01$), while descriptions of females failed to correlate with descriptions of successful middle managers. Many other authors report similar stereotypes based on gender (e.g., Tyler, 1965; Bartol & Butterfield, 1976; Schein, 1975; Albrecht, Bahr, Howard, & Chadwick, 1977). There is also considerable evidence that, presumably based on these stereotypes, people respond differently to men and women in a number of nonsexually related social interactions such as hiring (Fidell, 1970), evaluation of personal competence and potential (Cecil, Paul & Olins, 1973; Deaux & Taynor, 1973; Pheterson, Kiesler, & Goldberg, 1971), and admissions to programs of study (Solman, 1976). It is clear, then, that sex stereotypes and sex-based discrimination are social facts, even in our enlightened era.

What impact does such stereotyping and discrimination have on the women who are gradually gaining their places in positions of leadership and authority (e.g., Orth & Jacobs, 1971; Chapman & Luthans, 1975) and on the people whom these women lead? Regretfully, we have little evidence upon which to base our answer to these questions. Social scientists simply have not investigated leadership of women very extensively, especially in situations where women lead men. Chapman and Luthans (1975) suggest that the major reason for the lack of attention given to female leadership is the fact that, in the past, women have infrequently held leadership positions. Certainly few women have attained national or international reputations as leaders. One might argue that while this has been true historically, many women in western society, perhaps because of greater awareness on the part of women and the society in general, are assuming leadership positions. An unpublished study by the author supports this view. College students were asked to list the ten "most important or influential leaders through all history" and the ten "most important or influential leaders in the world today." In the "through all history" category, the 31 subjects (18 female, 13 male) listed 8 females in a total of 304 responses. In the "in the world today" category, 39 females were included in the 298 responses ($X^2 = 22.86$, $p < .001$). Thus, as women assume more prominent and responsible leadership positions in our society, we should

be even more concerned with the effects of sex stereotyping and discrimination.

Though there are many problems of interest concerning women and leadership, three related questions readily present themselves in the context of the present discussion. First, we might ask whether women leaders behave differently (or at least are perceived as behaving differently) from men leaders. Second, we would want to know whether followers expect differences and respond differently toward women's leadership behaviors. Finally, and perhaps most importantly for applied purposes, we must ask how such differential behaviors, perceptions, and responses might affect the outcome of the leader/follower interaction. In other words, does it make any difference in terms of practical results whether the leader is a man or a woman? Most of the research on leadership in women has asked the first two questions. Let us examine this literature before we consider the third question.

Do Women Leaders and Men Leaders Behave Differently?

In order to answer this question, we should first discover what behaviors are most relevant to leadership. This is no easy task, as hosts of factor analysts and trait theorists can affirm. Leadership characteristics, and presumably their associated behaviors, are notoriously fickle, surfacing in one research article, only to be discredited in some other (Mann, 1959). Because of this, leadership theorists began to de-emphasize the personal characteristics

of leaders and sought situational or environmental determinants of leadership. This approach, too, failed to provide a satisfactory explanation of leadership. As Hollander and Julian (1969) state, ". . . the trait and the situational approaches afforded a far too glib view of reality." Consequently, the dominant view today has become an interactional approach. Most theorists conceive of leadership as a social influence process involving the interaction of characteristics of the leader, the followers, and the situation. Not all characteristics of the leader affect the leadership process at all times, in all situations, to the same extent, or in the same ways. The contingency theories of leadership seem to offer the most promise for satisfactory explanations under this more complex framework (e.g., Fiedler, 1967; Kerr, Schriesheim, Murphy, & Stogdill, 1974). Briefly, the contingency approaches postulate leadership effectiveness as a function of both the leader's style of leadership and the characteristics of the particular group/task situation. Currently, such theories are in only the rudimentary stages of development. In the most prominent model (Fiedler, 1967), only one main dimension (though this dimension is related to three sub-components) of the situation, favorability for the leader, and only one characteristic of leader behavior, leadership style, are considered.

Since leadership style is considered so important in group interaction, and since it is commonly held (e.g., Parsons & Bales, 1955; Denmark, 1977) that men and women

prefer different leadership styles, it is relevant in the context of the present paper that we review the research that has been done on leadership style, and particularly that which deals with sex effects in leadership style.

Leadership Style

Leadership style has been investigated by a number of authors and is defined in several ways (e.g., Fiedler, 1967; Stogdill, 1963; Lewin, Lippitt, & White, 1939). For the most part, two styles of leadership seem to predominate. These two styles have been described as autocratic versus democratic, authoritarian versus nonauthoritarian, supervisory versus participatory, directive versus nondirective, task-oriented versus human relations-oriented and so on (Shaw & Costanzo, 1970). Perhaps the most common designation is that stemming from the Ohio State Leadership Studies (cf., Kerr et al., 1974)--consideration versus initiating structure. Although various authors may present these styles as representing an underlying single continuum (e.g., Fiedler, 1967; Bledsoe & Brown, 1977) or as two separate dimensions (e.g., Blake & Mouton, 1964), there appears to be considerable conceptual similarity among the various definitions. In general, a structure-oriented leader is more concerned with the task than with the followers. He gives more instructions, sets more explicit goals, and is less likely to express interest in his subordinates' opinions or personal problems. On the other hand, the consideration-oriented

leader is warmer and more understanding of his subordinates. He is more likely to elicit opinions and advice and to encourage good personal relations among group members. Usually, major decisions are made as a group rather than as unilateral decrees from the leader. Although leaders usually are predominant in one or the other of these styles, the behaviors involved are not mutually exclusive; in most cases a leader may display behaviors of both styles. One of the most popular measures of the consideration and initiation of structure variables is the Leadership Behavior Description Questionnaire (LBDQ) developed by Halpin (1957) and Stogdill (1963). Fiedler (1967) has also developed instruments to measure similar qualities (task-orientation and relationship-orientation).

Consideration and initiation of structure have been studied in a number of contexts, but the effects of these variables on leadership effectiveness should probably be understood in the context of the specific group/task situation (Korman, 1966). Though some propose that the best leader is one who is high in both structure and consideration (Blake & Mouton, 1964), experimental results indicate that the best style may be dependent upon the situation (Korman, 1966; Kerr et al., 1974; cf., Fiedler, 1967). Work by Fiedler and his associates (e.g., Fiedler, 1964, 1967; Hurt, 1967) suggests that the structure-oriented leader is most effective when the situation is either extremely favorable or unfavorable for the leader, while the consideration-

oriented leader is most effective when the situation is moderately favorable/unfavorable for the leader.

Differences between male and female leadership styles: Field research

It should not be surprising that much of the research seeking differences between men and women leaders has concerned leadership style. Many of these studies have investigated leadership in natural field settings. For example, Day and Stogdill (1972) mailed the LBDQ and a single item reputational scale ("good leader . . . poor leader") to civilian employees of the United States Air Force and asked them to rate their civilian supervisors. The resultant ratings were correlated with a number of supervisor demographic variables. Although the sample was severely restricted by self-selection (only 56 of 300 mailed questionnaires were returned and useable), the results suggest (not significant, NS) that women leaders are higher in both consideration and initiation of structure. There were clear differences in the career pattern/leader behavior correlations suggesting that women who achieve higher level leadership positions are more consideration-oriented and attend more formal training programs than men. The longer a woman remained at a given level of supervision, the more likely she was to use high initiation of structure. Having attained a given level of supervision, women leaders were rated as effective as men leaders at the same level. Osborn and Vicars (1976) found a similar pattern of results in a

field study at two mental institutions. Across both institutions, female leaders were reported as higher than male leaders in both consideration and initiation of structure. Since these two variables were also highly correlated with other demographic variables, these authors suggest that the sex effects may be artifacts. Thus, while the results are certainly consistent with the interpretation that women who attain leadership positions exhibit leadership styles different from those of men who attain similar levels, several potentially influential variables have not been controlled.

Bartol and Wortman (1976) investigated leadership in a large federal psychiatric hospital. They found that female, as opposed to male, leaders perceived themselves as higher in consideration, tolerance of uncertainty, and satisfaction with co-workers. Examination of male leaders' self-description scale scores revealed a significant negative correlation between initiation of structure and satisfaction with co-workers, and a significant positive correlation between consideration and satisfaction with their jobs. Corresponding correlations for female leaders were not significant. Thus, in this study male and female leaders report different leadership concerns. On the other hand, in a study of military and civilian leaders in field settings, Chapman (1975) found no significant differences between males and females on the Least Preferred Co-worker (LPC) Scale (Fiedler, 1967). Scores on this scale ostensibly reflect the leadership style preferred by the individual, with a

high score indicating a relationship-oriented leader and a low score a task-oriented leader. Chapman did find a significant negative correlation for civilian male leaders between LPC scores and both the number of individuals supervised and the number of dependents. For female military leaders there was a significant negative correlation between LPC scores and the number of males supervised. Thus, in separate samples, males tended to be more task-oriented (i.e., structuring) as the number of subordinates increased, regardless of the sex of the subordinates, while females showed the same tendency only for male subordinates. One factor limiting this study, as well as most of the other field studies, is the fact that the number of male leaders in the samples was considerably larger than the number of female leaders. This is not surprising in light of our previous discussion of the limited access to leadership positions for women in our society. However, it does cause one to question the comparability of the samples, since (the small population of) women who achieve leadership positions in natural settings may be quite different from women in general.

Two other field studies further cloud the issue of whether female leaders and male leaders use different leadership styles. Bartol and Wortman (1975) found that female supervisors in a large federal psychiatric hospital were perceived by both male and female subordinates as higher in initiation of structure than male supervisors. Petty and

Lee (1975), on the other hand, in a study of non-academic university employees, found that (compared to male employees with male supervisors and female employees with either male or female supervisors) male employees with female supervisors described their supervisors as higher in consideration and lower in initiation of structure. Thus, among the field studies one finds evidence to support several positions on the question of differences between male and female leadership styles. While some researchers find no difference in style (Chapman, 1975), others report that women are higher in initiation of structure (Bartol & Wortman, 1975), higher in consideration (Bartol & Wortman, 1976; Petty & Lee, 1975), or higher in both consideration and initiation of structure (Day & Stogdill, 1972; Osborn & Vicars, 1976). Perhaps the laboratory studies, which we shall discuss shortly, will help us understand this conflicting pattern of results.

Before moving on to the laboratory studies, we should point out that some investigators have reported differences in interests and self-perceptions for women and men leaders. In a business setting, Schuler (1975) found that female leaders gave more importance to the opportunity to work with pleasant employees, while males valued more the opportunity to influence important decisions, to direct the work of others, and to earn more money. Herrick (1973), in a moderately large survey of federal and state executives (932 respondents, of which 53 were females) found minimal

differences in personal needs and values between males and females. The questionnaire results were compared within the state and federal categories. At the federal level, females indicated higher self-actualization needs, while males were more concerned with social needs and placed more importance on autonomy and esteem. At the state level, males were more concerned than females with self-actualization and security. Thus, while Schuler's (1975) results basically sustain the popular male/female stereotypes, Herrick's (1973) results question these stereotypes.

In summary, the field studies do not yield a clear answer to the question of differences in behavior between male and female leaders. Most studies do find some differences, but across studies the differences are not consistent. In general, it appears that women leaders who are continuing their upward climb in the organizational ladder may prefer a consideration-oriented leadership style, while women leaders who remain at a given organizational level for a long time prefer a structuring style. Number and sex of subordinates may also influence the female leader's leadership style, with increased preference for a structuring style as the number of male subordinates increases.

Differences between male and female leadership styles: Laboratory research

Complementing the field studies, a number of laboratory studies using college students as subjects have been concerned with the question of differences in behavior

between male and female leaders. In one study, Maier and Sashkin (1971) found a slight (NS) tendency for male leaders in a simulated work environment to exercise more dominance in initiating change than female leaders. A second study by the same authors (Sashkin & Maier, 1971) reports that female leaders of female groups complained of significantly fewer "problem" workers than male leaders of male groups. In the same experiment, female leaders were more likely to follow role guidelines established for the leader and tended to delegate work only when told to do so. Another study by Maier (1970) found that, unless they were provided with a suggested solution beforehand, women leaders of mixed-sex groups failed to dominate the groups' decisions on how to solve a problem. Provision of the "approved" solution had no effect on the male leaders' dominance. It would appear, then, that women leaders require more support before they are willing to assert themselves in mixed-sex groups.

Rosenfeld and Fowler (1976) report that female subjects who were asked to respond to descriptions of different leadership situations chose democratic behaviors as more important to effective leadership significantly more often than did male subjects. Furthermore, the personality profiles of autocratic women were different from those of democratic women, and democratic men exhibited different profiles from autocratic men. The authors suggest that personality profiles might be used to predict preferred leadership style for both sexes, but that women will generally be less autocratic than men.

Megargee (1969) found that women leaders sometimes adjust their behavior based on the sex composition of the group. In this study, college women who were high in dominance scores on the California Personality Inventory tended to exert leadership over women who had low scores. However, in mixed-sex groups, the high-dominant women allowed the low-dominant men to be the leaders. Analysis of the leadership selection process revealed that in the latter case, it was most often the high-dominant women who controlled who would be leader, most frequently appointing the man as leader. The author interprets these results as indicating that the high-dominant women exercised dominance in appointing the leader (a low-dominant male), but were reluctant to violate sex-role stereotypes which indicate that women should not be leaders in mixed-sex groups.

Eskilson and Wiley (1976) conducted an experiment which provides more evidence that women leaders respond differently in their leadership behaviors depending upon the sex composition of the group. Leaders of both sexes performed more leader-like behaviors, as indicated by an analysis using Bales' (1950) procedure, with three-person groups composed of all members of their own sex. However, female leaders were least leader-like when they led groups whose other members were all males, while male leaders were least leader-like when they led mixed-sex groups. Another interesting finding in the same experiment was that female leaders allocated significantly more of their behavior to

positive affect actions. Thus, it appears that women leaders conform to sex role stereotypes by acting more supportive than male leaders and by allowing males to assume some of their leadership prerogatives. Apparently, the more males present in a group, the less leader-like is the female leader's behavior. Recall, however, that in Chapman's (1975) field study, female leaders tended to increase their structuring behaviors as the number of males in the group increased. Our present knowledge is too limited to allow us to explain the apparent contradiction between these two studies. However, Eskilson and Wiley (1976) also found that female leaders performed more leader-like behaviors when they felt they had achieved the leadership status rather than just having been appointed leader. On the other hand, male leaders performed about the same proportion of leader-like behaviors whether they had achieved the leader status or had been appointed. Perhaps the women in Chapman's (1975) study thought that they had achieved their leadership positions due to their own merit, and were sanctioned to perform more leader-like, structuring behaviors. An increase in the number of male subordinates may have served to strengthen the women leaders' sense of legitimacy by serving as a sign to the women that they were particularly qualified to be leaders, since there were obviously many men available who could have been selected as supervisors. At any rate, further research will be required before we can develop a

satisfactory explanation for the differences between Chapman's (1975) results and Eskilson and Wiley's (1976) results.

Jacobson and Effertz (1974) conducted an experiment in which followers were required to construct a figure with dominoes using only the leader's instructions as guidelines. Sex of leader and sex of follower were crossed factors. Although objective performance between the four groups did not differ (all performed fairly poorly), there were differences in the leaders' and followers' perceptions of the outcomes. Along with other differences, male leaders were found to be more critical of the group's performance and of their own effectiveness. Other results of this experiment will be discussed in a later section.

An experiment by Lee and Alvares (1977) reveals a phenomenon which should give rise to caution in interpreting any measures of leader behavior which are based on follower observations. In this study, followers completed LBDQ's on leaders who had been specially trained to enact specific combinations of leadership behaviors. Female leaders and male leaders displayed four combinations of leadership styles: high structure, high consideration; high structure, low consideration; low structure, high consideration; or low structure, low consideration. A fourth factor in this completely randomized factorial design was the sex of the follower. Based on a multivariate analysis of variance of results on the LBDQ and other scales, the authors report a

significant multivariate interaction for sex of supervisor X consideration X initiation of structure. This multivariate interaction appears to be based on the structure dimension, and group means reveal that in high-consideration, high-structure groups the male supervisors were described as being lower in structure than female leaders displaying the same leadership behaviors. This finding tempers a significant main effect on the structure dimension for sex of supervisor in which female leaders were reported as higher in structuring behaviors. These results seem to indicate that followers accentuate female leaders' (non stereotypic) initiation of structure. However, male leaders appear even relatively less structuring when they combine a structuring style with a consideration style. Perhaps these results indicate a kind of contrast effect (Sherif & Hovland, 1961), in which non stereotypic behavior by a leader of either sex is accentuated. A further finding of this study was that females in general described their supervisor, regardless of sex, as more considerate. The results of this study indicate that followers may rate the same leader behaviors differently depending on whether the behavior is enacted by a male leader or a female leader.

Thus, both field and laboratory studies provide some evidence that women leaders behave differently from men leaders, and that sex of followers, amount of support, and length of time in the position can influence their leadership behaviors. In general, the evidence seems to support

a compensation response on the part of women leaders. Depending upon the situation, they are more likely to initiate more extreme leadership styles (consideration or initiation of structure), while at the same time striving to maintain traditional feminine role behaviors such as outward deference to males and less assertiveness. The evidence for such effects is not overwhelming, however, and it remains to be seen whether such differences will vanish as women come to hold more leadership positions in our society. Even if sex-related differences in actual leader behavior are tenuous, there are fairly robust stereotypes (as we shall see in the next section) of what constitutes effective leadership behavior for women. These stereotypes can affect the followers' perceptions of their women leaders and how they respond to these leaders.

Do Followers React Differently to Women Leaders?

It is clear that women are not usually expected to serve as leaders in a man's world. For example, Schein (1973), as noted earlier, found that male middle managers thought that women did not exhibit the requisite characteristics of successful middle managers. Schein (1975) replicated these results with female middle managers as subjects. Similarly, Cecil et al. (1973) reported that undergraduate students asked to rate the potential of job applicants tended to rate female applicants as more suited for clerical work and male applicants as more suited for management

roles. The next several studies reviewed investigate stereotypes that one might expect to find in view of the results reported above. These stereotypes reflect what women (who are not generally suited for leadership in mixed-sex groups, according to prevalent stereotypes) are, or should be, like if they do find themselves in leadership roles.

Sex Stereotyping in Leadership

Recently, Frank and Katcher (1977) asked male medical students to rate their female peers from six-person laboratory groups on several dimensions. Interestingly, when a group had more than one woman in it, women were perceived as equal in task orientation to men. However, when only one woman was in a group, the woman was seen as significantly less task oriented than her male counterparts. Women were rated lower on dominance, no matter what the sex composition of the group. The authors suggest that in this highly structured situation, the males tended to stereotype women's behavior and exclude them from leadership positions.

In a study with undergraduates and banking supervisors as subjects, Rosen and Jerdee (1973) found that female supervisors were expected to be more successful as leaders if they used a friendly-dependent leadership style, while male supervisors were expected to be more successful using a reward style of management. Similarly, Bartol and Butterfield (1976) found that students rated male leaders more favorably if they used an initiating structure leadership

style, while female leaders received more favorable ratings when they used a consideration style. Female subjects generally rated the initiating structure style more favorably than did male subjects. Lee and Alvares (1977) report that female college students rated their "supervisors" in a simulated industrial setting as higher in consideration than did their male counterparts. In the same study, subjects rated female supervisors who exhibited high consideration and high initiation of structure as being higher in initiation of structure than male supervisors who exhibited equivalent leadership behaviors.

The results from these last three experiments offer a difficult interpretation problem. Seemingly, female (and male) subordinates think that female supervisors ought to use a high-consideration leadership style to be most effective as leaders. Yet, at the same time, females endorse high initiation of structure as the better leadership style. Furthermore, while female subordinates seem to expect and find more consideration on the part of their leaders, they rate female supervisors who exhibit high initiation of structure as even more structuring than equivalent male leaders. Perhaps this pattern of results could best be understood as follows: Female subordinates recognize the stereotypic proscription against female leaders using a structuring style, therefore leading them to conclude that women leaders will be more effective using the "feminine" (consideration) leadership style. But in keeping with

traditional sex-role stereotypes, the "male" style (initiating structure) is still better than the "female" style (consideration). Again, in keeping with traditional stereotypes, female subordinates expect to be treated as females (i.e., with consideration). When a female supervisor violates sex-role stereotypes and uses high initiation of structure, her subordinates (especially females) accentuate the discrepancy in what might be considered a contrast effect (Sherif & Hovland, 1961), as we hypothesized earlier (p. 17). This explanation would certainly require a firmer empirical base before we might accept it with any confidence, however.

Follower Responses to Female, Versus Male, Leaders

The work by Rosen and Jerdee (1973) and Bartol and Butterfield (1976) indicates that followers do have different expectations for male and female leaders, at least in terms of what leadership style is appropriate. One might suspect that such expectations would be accompanied by differences in response toward female, as opposed to male, leaders. Several studies have investigated follower responses to leadership by women. In the study by Jacobson and Effertz (1974) described previously, female leaders were rated by followers of both sexes as performing better than male leaders, despite the fact that subjects of both sexes rated female followers as performing worse than males. Furthermore, the leader's performance was rated lowest when

males led females. Male leaders themselves rated their group's performance and their own effectiveness lower than did female leaders. The authors interpret these results as indicating an expectancy by both males and females that male leaders would lead effectively, while female leaders would not do so well. Thus, when the male leader (who is expected to do well) does not attain the expected outcome (recall that all groups performed the task relatively poorly), both he and his followers downrate his performance. On the other hand, not so much is expected of female leaders, and when they obtain outcomes equivalent to those of male leaders, their performance is rated higher.

Job satisfaction has been used as another index of follower response to leadership. Petty and Lee (1975) found in their study of male university employees that satisfaction varied as a function of the leadership style used by the female supervisors. There was a strong negative correlation between workers' satisfaction scores and female supervisors' initiation of structure scores. On the other hand, there was a positive correlation between workers' satisfaction scores and female supervisors' consideration scores. Thus, the stereotype that female leaders should use a consideration style and not a structuring style is manifested in the satisfaction of the followers. Bullard and Cook (1975) report similar results. In their experiment, college students rated the group atmosphere (Fiedler, 1967)

as being better under relationship-oriented female leaders than under task-oriented females, but the pattern was just the opposite with male leaders. A study by Bartol (1974) points out that this relationship may not be universal. In an experimental design using college students as subjects, Bartol found that satisfaction with group interaction was higher for male followers led by a dominant female leader than for male followers led by a less dominant female leader. It is not clear whether dominance scores reflected clear leadership styles (i.e., high-dominant = structuring; low-dominant = considerate), but this study at least suggests caution in assuming that followers prefer female leaders who are consideration-oriented.

There is also evidence that women leaders do not exert as much influence on their followers' behavior as do men leaders. With a problem-solving task, Maier (1970) reports that followers in mixed-sex groups are swayed less by female leaders than male leaders unless the female leader has been given a suggested solution to the problem beforehand. Similarly, Fallon and Hollander (1976) report that male leaders generally have more influence on group solutions in mixed-sex groups.

In summary, it appears that followers may indeed respond differently to women leaders than to men leaders. Followers seem to expect consideration-oriented behavior from women leaders and structure-oriented behavior from men leaders. If these expectations are not fulfilled, followers may respond negatively by downrating their

satisfaction with the group situation. Furthermore, women leaders do not seem to exert as much influence over mixed-sex groups as do men leaders.

Thus far, we have observed that women leaders may behave differently from men leaders and that followers respond differentially to male and female leaders. The crucial question now becomes, given such effects, does it make any difference in the outcome of the leadership attempt whether the leader is a man or a woman? In other words, is there any discernable impact on the attainment of group goals due to the sex of the leader? This question is considered in the next section.

Does the Sex of the Leader Affect Attainment of Group Goals?

Some theorists consider group outcomes the measure of a leader's effectiveness (e.g., Fiedler, 1967). This stance has intuitive appeal and seems to make sense from a practical standpoint as well. Indeed, if there is no difference in outcome for groups led by females and groups led by males, consideration of sex differences in leadership becomes largely an academic exercise of little interest to society in general. We have mentioned previously that satisfaction of group members, can be affected by the leader's sex (e.g., Petty & Lee, 1975; Bartol, 1974; Bullard & Cook, 1975); but how does the sex of the leader affect the group's attainment of organizational or outcome goals--in other

words, the group's success? Relatively little recent research has been conducted on this important question.

Several recent studies have demonstrated differences in performance between male and female groups. Although these experiments were not primarily concerned with sex of the leader, it is a factor completely confounded with sex composition of the group. Some investigators found performance differences in favor of male groups (e.g., Shaw & Harkey, 1976; Bell, Cheney, & Mayo, 1972), while others found differences favoring female groups (e.g., Bruce, 1974). The primary factor determining whether male or female groups perform better seems to be the type of task employed. Research by Bell et al. (1972) also suggests that females perform better when the group does not interact in a face-to-face fashion, while the opposite is true for male groups. How much the sex of the leader influences these performance differences cannot be determined because sex of the leader and sex composition of the groups always vary concomitantly.

Of course, since the leader is part of the group, it is practically impossible not to confound leader's sex with group composition. For example, in a group of three males and three females, if the leader is a male, then the followers will be two males and three females. If, on the other hand, the leader is a female, the followers will be three males and two females. Thus, sex composition of the group (excluding the leader) is confounded with the leader's sex in that a change in leader sex produces a change in sex

composition for the rest of the group. If the group is composed of an odd number of members, one can have the sex composition for followers independent of leader sex, but the total sex composition varies with leader sex. For example, in a group of seven persons, if one has three males and three females as followers, the total group consists of three males and four females if the leader is a female, or four males and three females if the leader is a male. In spite of this kind of confounding, many researchers maintain that the important factor, especially when the total group is approximately balanced for male and female members, is the distinction between "mixed-sex" and "same sex" composition.

It occurs to the author that investigation of the effects of leader's sex on group process in mixed-sex groups is, from a practical standpoint, more interesting than the study of differences between groups completely composed of males versus groups completely composed of females. In all areas of our society, we are seeing increasing numbers of work groups with mixed-sex composition; advisory groups and other such bodies appear to be following a similar trend. Furthermore, the effects of sex discrimination would seem to be most keenly felt in mixed-sex groups, though one could probably make a case for the effects of negative stereotypes held by one sex against members of their own sex (e.g., Goldberg, 1968). At any rate, the mass media seem to indicate that sex stereotyping in mixed-sex settings is the

weightier social problem in our culture. The present research is consequently directed toward understanding effects of the leader's sex on his/her effectiveness in mixed-sex groups. Some previous research has addressed this question, but results have not been conclusive.

For example, Bullard and Cook (1975) report that, in a problem-solving task, relationship-oriented followers of either sex led by relationship-oriented females performed significantly better than those led by relationship-oriented males. There was also a tendency (NS) for relationship-oriented followers led by task-oriented males to perform better than those led by task-oriented females. On the other hand, with their problem-solving task, Jacobson and Effertz (1974) found no differences on solution scores attributable to the sex of the leader. It would appear then, that sex of the leader can, but not necessarily will, affect group success, depending upon other variables. What are the variables which actuate sex of leader effects? Unfortunately, research that would allow us to answer this question is sparse. It appears from Bullard and Cook's (1975) study that leadership style may be one important variable interacting with leader sex to influence performance scores.

Where Do We Go From Here?

After reading the above review, the reader may have already arrived at an answer to this question. In the author's opinion, a viable response is that more research

is needed to help us understand how the leader's sex interacts with other important variables to influence group performance in small, mixed-sex groups. One such variable, which may interact with the leader's sex and which has received a lot of attention in the literature, is leadership style. The current evidence suggests that prevalent stereotypes are in accord with Parsons and Bales' (1955) theory that women in our society are expected to perform expressive or socio-emotional functions, while men are expected to perform instrumental or task functions. Thus, based only on Parsons and Bales' theory, a woman leader would be expected to use a considerate style, while a man would be expected to be more structuring. Presumably, Parsons and Bales' theory would imply that leaders who violate these stereotypes would be less effective. Although this decreased effectiveness is suggested by the literature (e.g., Bullard & Cook, 1975), it has not been demonstrated clearly, perhaps because most researchers have concentrated on leader/follower perceptions rather than on actual group performance.

Of course, Fiedler's (1967) contingency theory of leadership ignores leader sex as a predictor of appropriate (for greatest effectiveness) leadership style. Thus, to some degree, Parsons and Bales (1955) and Fiedler (1967) might disagree as to what is important in predicting leader effectiveness. For the former, leader sex is seen as perhaps the main determinant of which leadership style is most

effective; for the latter, favorability of the situation for the leader is the key variable affecting leader effectiveness.

Responding to the partial conflict between these two theories, and to the relative lack of research on leader effectiveness as a function of the leader's sex and leadership style, the author designed an experiment which addresses the question of how leader sex and leadership style affect leader effectiveness. This experiment, and the scaling procedure requisite to its conduct, are described in subsequent sections of this paper. Before presenting the procedural details of the main experiment, the author will describe the basic experimental design and propose a number of specific hypotheses generated by our analysis of prior research and relevant theories.

Experimental Design

The experiment employed a 2 X 2 X 2 X 8 randomized blocks factorial design with the independent variables sex of the group leader (male, female), leadership style (structuring, considerate), and order of task presentation (task A first, task B first), and the blocking variable time period of participation (first eight groups through last eight groups). Groups consisted of two male and two female undergraduates. The leader was selected randomly according to sex condition and was instructed in the use of the required leadership style. The two group tasks were a motor skills game (playing an electronic television game) and a verbal

skills game (forming words from a given configuration of letters). Detailed descriptions of the games and procedures appear later.

The primary dependent variables were the group scores on the two tasks, group members' ratings of their group's interactions, and observations of the strategies employed by the groups in accomplishing each task. Of principle interest were the effects of the leader's sex and leadership style on the dependent variables.

Hypotheses for the Experiment

According to Fiedler's (1967) contingency theory, task-oriented leaders are more effective when the situation is either highly favorable or unfavorable for the leader, while human relations-oriented leaders are more effective in the moderate ranges of favorability. Fiedler defines favorability of the situation for the leader in terms of three variables: (1) the leader-member relations, (2) the task structure, and (3) the leader's position power. Fiedler and his associates (Fiedler, 1964, 1967; Fiedler & Chemers, 1974) operationalize leader-member relations via the Group Atmosphere Scale (GAS). Task structure is measured by having raters rate the task along several dimensions proposed by Shaw (1963). These dimensions are goal clarity, solution multiplicity, decision verifiability, and goal path multiplicity. Highly structured tasks are said to have clear goals, few solutions, readily verifiable

decisions (by appeal to authority, mathematical proof, etc.), and few paths by which the task may be successfully performed. The leader's position power is either considered to be obvious from the position (i.e., a military commander is vested with high position power; a chairperson for an ad hoc advisory board of community leaders has low position power), or is rated by means of a checklist developed by Fiedler (1967) or Hunt (in Fiedler, 1967). Based upon these three variables, Fiedler has divided the situational favorableness dimension into eight areas. The first three octants are considered highly favorable for the leader, while octants four through seven are moderately favorable, and octant eight is unfavorable.

In the present experiment, the author sought to locate the situational favorableness in the second octant. This octant is in the highly favorable range. According to Fiedler's (1967) description, this octant is characterized by good leader-member relations, structured tasks, and weak leader position power. This octant was chosen for the experiment for several reasons. First, Fiedler and his associates report that it is difficult in an ad hoc laboratory group to establish poor leader-member relations. Apparently, most people will give a leader the benefit of the doubt during a limited interaction which promises no future interaction. Second, it is difficult to invest the leader of a laboratory group with much position power. The group members all know that the leader has no real control over

their lives; he cannot hire or fire, give pay raises, etc. Therefore, despite the experimenter's attempts to buoy the leader's power, it is likely to be relatively weak. Within the bounds of practicality, then, typical laboratory groups are limited to good leader-member relations and weak position power. The third variable, task structure, is relatively easy to manipulate. Thus, the experimenter faced a choice between using a structured task, which would locate the favorableness in the highly favorable range, and an unstructured task, which would mean that the favorability was moderate. The options for octants were limited to these two by practical considerations. The final choice was made for theoretical reasons. Fiedler's theory predicts that a task-oriented (structuring) leader will be more effective in the highly favorable situation, while a human relations-oriented (considerate) leader will be more effective in the moderately favorable situation. Parsons and Bales (1955), however, indicate that a female leader should use a considerate style, presumably regardless of the situational favorableness. In the moderate favorability range, the two theories make convergent predictions concerning which style the more effective female leader should use. For male leaders, the predictions would be opposite. Parsons and Bales indicate that male leaders are expected to be structuring to be effective, while Fiedler says that in this favorability range male leaders should be human relations-oriented. Similar reasoning for the highly favorable

situation reveals that while Fiedler says leaders of both sexes will be most effective using a task-oriented style, Parsons and Bales suggest that the female leader would be violating sex-role stereotypes by using this style and should rather use a more nurturant style. Since a major purpose of this paper is to direct attention to questions concerning leadership in women, the choice was made to observe the case where the theories diverge on which style the female leader should use; that is, in the highly favorable range.

Thus, all hypotheses listed in subsequent discussion assume that we are observing leader behavior in a situation which, in terms of Fiedler's (1967) theory is highly favorable for the leader; specifically, in a situation where the leader/member relations are good, the task is structured, and the leader's position power is weak.

Hypotheses concerning leader effectiveness

In the experimental situation just described, the contingency theory predicts that a structuring leadership style will be most effective. However, if a woman leader employs a structuring style, she violates sex-role stereotypes. Therefore, we might expect her effectiveness to be impaired. These considerations, along with our analysis of the previous research, lead to the following hypotheses for the situation under consideration:

(1) Structure-oriented leaders should be more effective than consideration-oriented leaders.

(2) Since male leaders in the structuring leadership condition have the advantage of congruence of stereotyped leadership style and theoretically more effective style, male leaders will be more effective than female leaders.

(3) However, both these main effects will be tempered by an interaction between leader's sex and leadership style. Male leaders will be more effective using a structuring style, while both sexes will be equally effective using a consideration style.

This last hypothesis is based on the assumption that violation of female sex-role stereotypes will decrease the favorability for the leader to some significant degree. Fiedler and his associates have not considered sex of the leader as a significant factor in most of their work, nor have they addressed the issue of sex-role stereotypes. However, Fiedler (1967) and Bennett (1977) have shown that such factors as language differences, religious disharmony, and disparate cultural backgrounds can significantly alter the favorability for the leader. The author predicted a similar effect for violation of sex-role stereotypes. In the present situation, three such violations should occur. First, research by Megargee (1969) suggests that women are not expected to be leaders in mixed-sex groups. Furthermore, use of a structuring leadership style by a woman is nonstereotypic. Likewise, use of a consideration style is

nonstereotypic for male leaders. Thus, female leaders using a structuring style face double jeopardy: once because they should not be the leader in the first place, and again because they use the wrong style. Male leaders using a consideration style are not faced with as great a sex-role discrepancy; at least they are the appropriate sex for a leader.

Fiedler's research has used male-led groups. Using only male leaders, this research has shown that, in the situation under consideration, task-oriented leaders are more effective. Consequently, relations-oriented leaders are less effective in this situation. Since Fiedler's theory predicts that a relations-oriented leader is more effective where the situation is moderately favorable for the leader, we must conclude that use of a nonstereotypic leadership style does not significantly reduce the favorability for a male leader. Otherwise, the male leader in the situation where group/member relations are good, the task is structured, and the leader's position power is low would be equally effective using either leadership style. This is because the male leader's use of a sexually inappropriate leadership style, if it did affect favorability, would reduce the favorability to the moderately favorable range, thereby making the relations-oriented leader the more effective. Since the research shows that the relations-oriented leader is not the more effective in our situation, we conclude that use of sexually inappropriate leadership

style by male leaders, at least in the situation specified, does not reduce the favorability of the situation for the leader.

The reader may recall that the author has assumed the leadership styles connotated by the terms "consideration" and "initiation of structure" to be equivalent to Fiedler's "human relations-oriented" and task-oriented" styles. Fiedler may not agree that these terms are interchangeable, since he considers the person's orientation to be a fundamental personality dimension (Fiedler & Chemers, 1974), perhaps influencing much more than a person's leadership style. Nevertheless, within the context of a limited-interaction ad hoc laboratory group, we are expecting our "structuring" leaders to behave in much the same way as Fiedler's "task-oriented" leaders. Similarly, we expect our "considerate" leaders to simulate "relations-oriented" leaders. Thus, in light of our previous discussion, we do not expect that male leaders using the sexually inappropriate consideration (i.e., relations-oriented) style will significantly reduce the favorability of the situation for the leader. This may not be the case for female leaders using a sexually inappropriate style, however.

Lacking appropriate experimental evidence, we might speculate, based on the double jeopardy discussed above, that use of sexually inappropriate leadership style by female leaders <u>may</u> significantly reduce the favorability for the leader. Thus, we might expect that a female leader

using a structuring style in the present situation will actually be faced with moderate, rather than high, favorability. Therefore, the female structuring leader would not be expected to be as effective as the male structuring leader. In the consideration style, both sexes violate sex-role stereotypes: male leaders because they are using the inappropriate style, and female leaders because they are not expected to hold the leadership position. Therefore, both sexes should be equally effective as leaders. Thus, we propose Hypothesis 3.

Hypotheses concerning group members' ratings

We have seen in our review of the literature that sex stereotypes are pervasive. The evidence suggests that, whether or not there are differences in effectiveness between male and female leaders, there are certainly differences in how leaders of each sex are perceived. We would also expect the leadership style to affect the group members' perceptions of the leader. In view of these considerations, and based on the literature reviewed, the following hypotheses are presented:

(4) The leader's sex should significantly affect the group members' ratings of the group interaction and of the leader's behavior. Furthermore, male and female leaders will differ in their perceptions of the group interaction. (This main effect, as well as that for leadership style as postulated in Hypothesis 5, will be qualified by the interactions proposed later in Hypothesis 6.)

A number of specific predictions based on the literature may be made under the aegis of Hypothesis 4.

(4a) Male-led groups will be rated as performing worse than female-led groups (Jacobson & Effertz, 1974).

(4b) Male leaders, when compared to female leaders, will be seen as more influential in the group interaction (Maier, 1970; Fallon & Hollander, 1976).

(4c) Male leaders will rate the group situation less favorably than female leaders (Sashkin & Maier, 1971; Jacobson & Effertz, 1974).

(4d) Male leaders will be more critical than female leaders of their groups' and their own performances (Jacobson & Effertz, 1974).

(4e) Female leaders will be more favorably endorsed by their followers than male leaders (Jacobson & Effertz, 1974).

We might also expect the leader's leadership style to affect the group's ratings as follows:

(5) Structuring leaders should be seen by group members as more structuring than considerate leaders; considerate leaders will be seen as more considerate than structuring leaders.

Substantiation of Hypothesis (5) will be evidence that the manipulation of leadership style in the present experiment was effective. However, the reader may recall that Lee and Alvares (1977) found that group members perceptions of leader structure and consideration are not always

veridical. Whether group members' perceptions of leader behavior in the present experiment are, in fact, veridical will be checked by having independent observers code leader behaviors from randomly selected groups and comparing the observers' reports with reports from the group members.

Again, based upon the literature, we would expect:

(6) Leader's sex and leadership style should have an interactive effect upon the group's ratings of the leader and of the situation. Specifically,

(6a) Female leaders using a structuring style will be rated as more structuring than male leaders using the same style, but male leaders using a considerate style will be rated more considerate than female leaders using the same style (Lee & Alvares, 1977).

(6b) Female leaders will be more favorably endorsed by their followers if they use a considerate style, while male leaders will be more favorably endorsed when they use a structuring style (Bartol & Butterfield, 1976).

(6c) The group atmosphere will be rated as more favorable under consideration-oriented female leaders than under structure-oriented female leaders. The opposite will be true for male-led groups (Bullard & Cook, 1975; Petty & Lee, 1975).

Finally, we might also expect, based on the results of Lee and Alvares (1977), that the sex of the follower will affect the ratings as follows:

(7) Female followers should rate their leaders as more considerate than do male followers.

Hypotheses concerning strategies on the tasks

Considering the differences in task orientation between considerate and structuring leaders, one might expect that groups under leaders with such contrasting styles should approach the tasks set for them in different ways. In general, we would expect:

(8) Structuring leaders should be more concerned with getting the group organized and directed toward the task goal; considerate leaders should be more concerned with involving all group members and allowing other group members to contribute to the task strategy.

Thus, where a goal may be reached more effectively by selective use of skilled group members, as in the TV task for the present experiment, we would predict that:

(8a) The number of participants in skilled positions will be smaller for groups led by structuring leaders than for groups led by considerate leaders.

This hypothesis is based upon the assumption that some group members will be noticeably better at the task than others. The task-oriented leader would choose to allow these members to participate on the task as much as possible, while the considerate leader might be more concerned with having everyone participate equally.

(8b) In preparing for a task, structuring leaders will test the skills of all group members to try and determine which group members perform best in each capacity; considerate leaders will be more likely to allow group members to select their own duties.

(8c) Structuring leaders will be more likely to appoint group members to specific duties.

Hypothesis concerning LPC scores

We have considered LPC score as an indication of a person's orientation toward leadership. The work by Parsons and Bales (1955) and Rosenfeld and Fowler (1976) would lead us to expect that females would be more human relations-oriented (higher LPC score) than males, though Chapman (1975) failed to find this so in his study of military and civilian leaders. Nevertheless, we offer the following hypothesis:

(9) Males should be more task-oriented than females.

The nine hypotheses we have just presented are offered because of their theoretical revelance. None of these hypotheses have dealt with the third factor in our design, order of task presentation. Preliminary work had led us to expect that the order of task presentation would affect the subjects' ratings of the group/task situation, but that no effects for order would be seen in the performance or strategy scores. Since task order is not of theoretical interest

in the present context, no specific hypotheses concerning task order effects are offered.

Similarly, preliminary ratings had led us to expect that one task (the TV game) would be seen as biased in favor of male participants. Any such bias might lead toward better performance by male-led groups on this task. Such an advantage could modify previously offered hypotheses in the following ways (in the case of the TV task only):

For Hypothesis 2, the case for predicting greater effectiveness for male leaders is strengthened; for Hypothesis 4, rating differences based on the sex of the leader should be accentuated. Other hypotheses would remain essentially unaltered.

CHAPTER II

THE RESEARCH

Main Experiment

As was noted in Chapter I, the research for this paper called for two phases. In one phase, the tasks used in the main experiment were scaled according to relative task structure, and the tasks were checked for perceived sex bias; in the other phase, the experiment described previously was conducted. Since the reader is familiar with the basic design and hypotheses associated with this experiment, we shall describe the procedures used in the main experiment first, followed by the procedures used in the task ratings.

Subjects for the Experiment

Subjects for the experiment were 256 undergraduate psychology students at the University of Florida who participated in the experiment in partial fulfillment of a course requirement for experimental participation. Sixty-four groups of four, two males and two females in each, were formed by having the subjects select a convenient time during the middle eight weeks of the fall quarter and place their names on a sign-up sheet beside the selected time. Subjects were asked not to sign up with people they already

knew. Groups were assigned to experimental conditions on a random basis within eight group blocks, with each block roughly corresponding to one week within the eight weeks during which the experiment was conducted. These blocks were formed to allow evaluation of the hypothesis that student subjects perform better during some parts of the academic quarter than in others, and to allow for some degree of statistical control over this potential nuisance variable. It was hoped that time of the quarter would not be a significant factor, thus allowing this factor to be dropped from subsequent analysis. Each of the eight levels of experimental conditions occurred once, in random order, within each block.

The leader of each group was selected at random according to appropriate sex condition. However, a "test of leadership ability" (which has face validity but lacks any other type of validity) ostensibly served as the method of leader selection (Appendix A). The "leadership test" was used to enhance the leader's legitimacy in the eyes of the group members. The leader received special instructions (described later) directing either a structuring or a considerate leadership style.

Apparatus and Materials

The experiment was conducted in a group dynamics laboratory furnished with one large round table, seven chairs, and two smaller tables. A Telstar Alpha home

video game (made by Coleco) was placed on one of the small tables and connected by appropriate cables to a Sony 19-inch color television monitor. The monitor sat on the second small table and was located in one corner of the room. The video game table was centered in front of the TV monitor and placed approximately 1.5 m away, and two chairs were located near the table.

Two of the games available on the Telstar Alpha were used during the experiment. Both games were played with the skill switch at the intermediate level. Players had access to two control knobs which allowed them to move an electronic "paddle" up and down on the monitor screen. In one game, "tennis," the paddles are located at opposite sides of the monitor screen. An electronic "ball" moves at a uniform lateral rate (once every two sec) from one side of the screen to the other. When the ball hits a "sideline" on the court which appears on the monitor, its angle of travel is changed, but it continues to travel at the same lateral rate. If the ball travels the entire width of the screen and is not intercepted by the appropriate paddle, a distinctive tone sounds and a point is automatically added to the score (displayed at the top of the screen) of the player from whose side the ball originated (was "served"). The ball is then automatically set in play from the side of the player who just scored. If the player opposite the server intercepts the ball with his paddle, the ball is returned to the server's side and the server must try to intercept

the ball with his paddle. Play continues in this fashion until one player reaches a score of 15 points, at which time the score is frozen and the paddles no longer affect the flight of the ball. The second game, "jai-alai," is played with both paddles on the same side of the screen. At the opposite side and along the top and bottom of the screen are electronic "walls" which deflect the ball toward the paddles. Players must alternate returning the ball toward the walls by use of their paddles. Each time a player fails to return the ball, a point is added to his opponent's score. Once again, the ball travels at a uniform lateral rate and the game is over when one player scores 15 points. As before, the scoring and serving are automatic.

In the present experiment, subjects were told to keep the ball in play for as long as possible on each game. That is, they were to avoid reaching a score of 15 for either player for as long as possible. Therefore, instead of competing with each other, the players were to cooperate and prolong the game. The group task score for these games was arrived at by dividing the number of seconds the game was played (before one player reached a point score of 15) by two. Detailed instructions are found in Appendix B.

For the word task, the large round table was located approximately 2.5 m away from the TV game on the opposite side of the room. Four chairs were placed around the table at four positions labeled "A," "B," "C," and "D." A standard college dictionary, supply of blank paper, and pencils

were set in the middle of the table, to be used as the groups saw fit on the verbal task. In addition, two stimulus cubes were prepared for this task. The cubes were approximately 9 X 9 X 9 cm and were blank on the tops and bottoms. On each of the other four sides a chart was placed containing an array of nine 48 pt lower case letters arranged as shown below.

		w	b	i			r	t	a
(1)		f	e	l		(2)	e	l	m
		u	d	o			s	o	p

The first array appeared on all four sides of one cube (the practice cube), and the second array appeared on all four sides of the other cube (the task performance cube).

The object of the task was to make as many words as possible by connecting, in the proper order, contiguous letters from the chart. Each letter could be used only once in a given word. Every word formed had to be found in the desk dictionary provided in order to be valid. Each group was required to turn in one list of words for scoring at the end of the task performance period. The task was scored in the following manner: Each valid word of two or three letters counted one point. An additional point was added for each letter above three. Three points were deducted from the score for each word on the final list which was misspelled, appeared more than once on the list, or was not

formed in accordance with the rules. Detailed instructions for this task are found in Appendix C.

Questionnaires designed to assess various group member characteristics and impressions included: Questionnaire Number 1 (Appendix D), which was the LPC Scale (Fiedler, 1967); Questionnaire Number 2 (Appendix E), which contained items from the LBDQ (Stogdill, 1963; here modified to fit the experimental situation), the Group Atmosphere Scale (GAS: Fiedler, 1967), and 21 questions designed to assess the subjects' reactions to the experimental situation.

Other forms were developed to use in recording group performance and strategy data (Appendix F) and for use by observers who recorded certain categories of behavior on the part of the leader and group members during selected experimental sessions (Appendix G). Subjects were also provided an informed consent form (Appendix H) which they completed prior to the experiment. A discussion problem selected from Shaw's (1963) compilation was also reproduced, along with instructions for the problem (Appendix I).

Experimental Procedure

Upon arrival at the experimental room, subjects were allowed to seat themselves at the round table. The subjects' sex and seat position were recorded. Subjects were then given the informed consent briefing (Appendix H) and asked to complete the form. After the subjects had read the briefing, the experimenter asked if there were any questions about the experiment and gave a brief explanation of what

the group would be doing. The subjects were then told that they would have a chance to earn points working together as a group during the experiment. It was explained that these points were important because the number of points the group earned determined the number of chances they would have to win a $20 prize which was to be awarded to one group at the end of the quarter. Each point earned on the two types of task counted as one chance in the random drawing for the prize. Therefore, the more points the group earned, the better their chances of winning the prize. The group was told that they would have a chance later (on Questionnaire 2, Appendix E) to indicate how they would like to divide the money if they should win the prize. Subjects were then told that one person would be the leader of the group and would be given instructions as to what the group was to do. The experimenter further explained that the leader was to be selected by a standardized "test of leadership ability" (Appendix A). Subjects then completed the "test" according to the instructions contained thereon. The leadership test and all subsequent questionnaires which the subjects completed were pre-coded as to seat position. While the subjects were completing the test, the experimenter surreptitiously flipped a coin to determine which group member of the predetermined appropriate sex would be the group leader. The experimenter then "scored" the leadership test while the subjects completed the LPC Scale (Appendix D).

The seat position of the leader, who was said to have been selected based on the test results, was then announced.

After the leader had been selected, the experimenter announced that the leader would be escorted into another room where he or she would receive instructions on what the group was to do and how they could earn points. The group was also told that, since the experimenter was not part of their group, any questions about the experiment from this point on should be directed to the leader. The three group members other than the leader were told that they would be asked to participate in a discussion task (Appendix I) while the experimenter was briefing the leader. It was explained that the group was not expected to come to any consensus or provide a solution to the problem, and that no points could be scored on the discussion task. The purpose of the discussion was said to be to let the group members get to know each other better.

The leader was then escorted into a private room where he or she received leadership style instructions and instructions on the first task that the group was to perform. The leader was told that the experimenter was interested in studying how groups respond to different leadership styles and that he would ask the leader to use one of two common leadership styles in his/her interaction with the group. It was explained that enactment of the leadership style was an integral part of the experiment, and that the experimenter wanted the leader to use the style assigned,

no matter what his or her normal style might be. The two leadership styles were then briefly contrasted and the leader was given a more detailed explanation of the style that he/she was expected to use. The briefing for structuring leaders covered the following major points:

> You are the leader. You are responsible for organizing the group. Your main goal is to have the group do as well as possible, regardless of whether or not you please everyone in the group. The buck stops with you on any decisions that have to be made. You should come up with some plan on how to accomplish the task with maximum success. You should decide what each person in the group is to do and assign these duties. You should not worry whether other group members resent your getting the group organized as you think best. This is not a popularity contest. You want your group to do the best they can, and you need to be a firm, businesslike leader, though you are not to intentionally antagonize group members in being so. You are simply primarily concerned with the task.

The briefing for considerate leaders covered the following points:

> Though you are the leader, you must consider the fact that you have three other people in your group who are sources of ideas and talents. You should try to establish good relations among your group members and between yourself and your group. Other group members should be involved in the decision-making process. You should promote an atmosphere of friendliness and consideration, while at the same time urging your group to perform as well as possible. Even though you are the leader, you are not a General Patton, and your group members are not privates in your army. You should provide guidance for your group without antagonizing them. You want your group to do as well as possible, but you must always consider the feelings of your group members.

The leaders in both leadership style conditions were told that there were no rules concerning the number of group members that must participate in the games. Furthermore, all relevant rules were explained in the task description

which the leader was soon to receive. The experimenter explained that a practice time would be allowed before each task, and that during this time the experimenter could answer any questions that the leader may have concerning the task. The leader was told that the experimenter would not answer any questions from group members unless they were relayed by the leader during the practice time, and that during the actual performance of the task the experimenter would answer no questions except the leader's inquiries concerning time (how much time has passed, how much time remains). At this point the leader was given the instructions for the first task (Appendix B or Appendix C) and any questions about the task were answered. If the experimental condition required that the TV game (Task A) come first, the leader was told that he/she would have 15 minutes to get the group ready to perform the task and practice. If the word game (Task B) was to come first, 10 minutes for practice and preparation were allowed.* The experimenter provided no

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*The amount of time allowed for practice on each game had been determined in pre-tests, where modal times for groups' on-task practice behaviors were observed and selected as the appropriate length for practice times. A second consideration was the total amount of time, including practice, spent on each task. It was found that by using 10 minutes as the practice period for the word game and 15 minutes for the TV game practice, most groups spent approximately equal total amounts of time on each task. Of course, the actual time spent on the TV task varied with group performance.

guidance as to strategy and would answer no questions concerning such, except to rule on the legality of using a strategy proposed by the leader.

For both tasks, the experimenter explained to the leader that the practice/preparation time could be used in any manner that the leader and group saw fit. The groups were allowed to practice the two phases of the TV game (if they so desired) and were provided with a practice cube (discussed previously) for the word game. Since the group members other than the leader did not know what the group was to do, the leader was told that he/she must explain the games during the preparation time.

For the TV game, the leader was told that the maximum allowable playing time during the performance period would be 10 minutes for tennis and 10 minutes for jai-alai. Thus, the maximum number of points for each phase would be 300 (i.e., 600 sec divided by 2 sec/point), with a maximum total game score of 600 if the ball were kept in play for the full 10 minutes on each game. No maximum score was announced for the word game, but the leader was told that during the performance time the group would have 10 minutes to list as many words as possible. The group score would then be determined based on the rules provided (Appendix C). Leaders were allowed to keep the rules with them during the preparation and performance times.

After the leader had received these instructions, the experimenter escorted him/her back to the group and the

practice/preparation period for the first task began. At the end of the preparation period, the experimenter started the first task performance period. When the group completed the task, the score for that task was announced. No comparisons between the group's score and some norm (i.e., what the "average group" makes) were made, even if group members or the leader requested such comparisons.

Upon completion of the first task, the experimenter escorted the leader back to the private briefing room and explained the second task. During this time, if a leader requested feedback on how well he/she was enacting the leadership style, the experimenter briefly restated the leadership style that was expected but gave no specific feedback on the leader's performance.

After the second leader briefing, the leader was returned to the group and the practice period for the second task began. After the practice period, the performance and feedback stages were completed as described previously.

During all phases of the leader/group interaction, the experimenter recorded various aspects of the strategies adopted and kept notes on what transpired during the interaction (Appendix F). The experimenter remained in the experimental room during this time, seated in an inconspicuous corner.

Selected groups were observed by a second person, who recorded the number of instances of pre-specified leader and group behaviors. Observers used a categorical tally

sheet (Appendix G) to record these behavioral episodes. Each of the eight experimental levels was observed twice at random over the course of the experiment. Five different observers (three males and two females) recorded the behaviors, with each observer serving at his/her convenience. Observers were seated in a small room adjacent to the experimental room, from which they could see and hear the group interaction quite well. The observers could also be seen by the subjects. Whenever an observer was present, the experimenter told the subjects at the beginning of the experiment that the observer would be present and that he/she would be watching the group interaction in much the same way as the experimenter. Subjects were instructed to ignore the observer.

When all tasks had been completed, the group members were given the post-experimental questionnaire (Appendix E). Then the group was debriefed concerning the purposes of the experiment and why the deception of the "leadership test" had been employed. Subjects were asked not to tell other members of their class who might participate in the experiment what had happened in the experiment. It was pointed out that not discussing the experiment was to their own benefit, since knowledge of the experiment might be an advantage for future participants, thereby affording them greater chances to win the $20 prize.

Dependent Variables and Other Measures

Three classes of dependent variables were observed: performance measures, strategy measures, and rating scores. The performance measures for the TV task were the total number of points scored and the number of resonances (explained in Appendix B). Performance measures for the word task were total number of points and number of penalties invoked. Strategy measures for the TV game included the number of players practicing the tennis and jai-alai, the number and sex of players used during the performance period, whether or not the jai-alai players both tried to hit the ball every time, whether the jai-alai players moved one paddle out of the way when it was the other paddle's turn to hit the ball, and the sex of the first persons to practice the game. Strategy measures for the word game included the number and sex of persons listing words, the number and sex of persons checking words in the dictionary, whether or not the leader appointed the listers and checkers, whether or not the group devised a systematic approach for seeking words, and which of three basic methods was chosen for completing the task (everyone call out words to a single lister; everyone list and have one person collect and compile the lists into a final list; everyone list and call out their lists to a final lister). Rating scores consisted of the LBDQ Scales (which also served as manipulation checks); the GAS score; questionnaire items dealing with

group performance, individual performance, satisfaction, enjoyment, attribution of responsibility for performance, importance of luck in performance, task difficulty, task goal clarity, task structure, task goal path multiplicity, leader's position power, endorsement of the leader by group members, attribution of responsibility for group performance to the leader, and division of the prize money if the group were to win the prize.

In addition to these dependent measures, one personality measure (LPC Score) was collected. This measure served as a covariate in some data analyses and also allowed the experimenter to assess whether the leaders' natural preference for leadership style would modify the effects of the experimental leadership style manipulation.

The final set of measures included the behavior counts gathered by the observers for 16 of the 64 groups. These observations were used as manipulation checks, along with the LBDQ ratings. Since group leaders had to explain the task to the group before any planning could take place, observers were asked not to begin their tallies until the leader had finished this basic explanation. This, along with the facts that some groups were more interactive and some groups played the TV games longer, led the experimenter to select the ratios of the leaders' structuring and consideration behaviors to the overall level of leader behavior as the appropriate measure of leader structure and consideration. This ratio automatically controls for differences

in absolute level of responding and length of interaction.

Task Ratings

Integral to understanding the results of the main experiment in terms of Fiedler's contingency theory is the placement of the group/task situation along with the favorability for the leader continuum. One aspect of favorability is the structure of the task. In order to place the experimental tasks along the structure dimension, judges were asked to rate the tasks in a fashion similar to that reported by Fiedler (1967). In addition to the structure ratings, judges were asked to rate the sex bias of the experimental tasks, since the experimenter suspected that the TV task would be seen as more appropriate for males and the word task for females.

Subjects for Rating Task

The judges were 19 female and 15 male undergraduate psychology students, mostly drawn from the same subject pool as the subjects for the main experiment. Subjects were not allowed to participate in both the main experiment and the task rating process. Six of the judges were in a second-level psychology course and volunteered to participate in the experiment for extra credit in their course. The judges all participated in the task rating process during the same academic term that the main experiment was conducted.

Apparatus and Materials

The judging process took place in several small experimental rooms equipped with tables and chairs. Ten judges could be accomodated at a time, with no more than four at any one table. A total of 10 task descriptions were rated by the judges. Two of the tasks were those used in the main experiment (Appendix J). The other eight tasks were selected from Shaw's (1963) compilation and represented a range of scale values on the four dimensions used by Fiedler to determine task structure. The tasks used were numbers 15, 37, 50, 68, 70, 77, 89, and 94. Each task description included information on the materials, instructions, solution, and scoring criteria for the task. A task rating questionnaire (Appendix K) was developed and used for the rating process. The questionnaire included instructions on how to complete the task ratings. Each task was rated on the following dimensions: Goal Path Multiplicity, Decision Verifiability, Goal Clarity, Solution Multiplicity, Population Familiarity, and Sex Bias.

Task-Rating Procedure

As subjects reported to the experimental rooms, the experimenter asked them to read the instructions for completing the task ratings and to ask questions about any part of the procedure that was not clear. After clarifying any questions, the experimenter escorted the subjects into one of the small rooms and asked them to take seats at one of

the tables. When the subjects had been seated, the experimenter shuffled the task descriptions for each rater and asked the rater to make his/her judgments of the tasks in the order in which they occurred. Subjects were then allowed to rate each task on a scale of eight categories for each dimension. The left extreme category was labeled "Low" on the dimension and the right extreme category was labeled "High" for all dimensions except Sex Bias, where the left extreme was labeled "Males Better" and the right extreme "Females Better." None of the interior categories was labeled, but the instructions explained that the categories were to be viewed as representing a continuum from one extreme to the other, and that proximity to the end points reflected varying degrees of these extremes. After each of the 10 task descriptions had been rated on the eight-point scales, subjects were asked to put the 10 tasks in rank order from highest to lowest on each dimension. This rank order was recorded on the questionnaire. After completing the rank orders, subjects were thanked and dismissed.

CHAPTER III

RESULTS

Task Ratings

Since proper understanding of the results of the main experiment is contingent upon placement of the group/task situation in the appropriate octant of Fiedler's contingency theory, results of the task rating procedure are presented first.

Ratings of four dimensions are relevant to Fiedler's theory: solution multiplicity, goal clarity, decision verifiability, and goal path multiplicity. Since the rater's sex may have influenced the ratings on the two experimental tasks differentially, tests of rater sex effects were conducted before scale values were computed. Difference scores between the ratings on the word and TV tasks were calculated, and the difference vectors for male versus female raters were compared using Hotelling's T^2 test. This test revealed no significant difference between sexes, F (4, 29) = .64. The hypothesis that male and female raters might differ in overall rating level, even though they did not disagree in the difference between the two tasks, was tested by conducting a Hotelling's T^2 test on the vectors of average scores for the two tasks on each dimension. Once again, the difference between male and female raters

was not significant, F (4, 29) = 1.33. Therefore, rater sex was ignored in the subsequent calculation of scale values.

Average rating scores (for all raters) for each of the dimensions listed above were, respectively: (1) For the TV task, 4.22, 6.94, 6.38, and 3.40; (2) For the word task, 6.40, 7.35, 7.40, and 6.12. After reflexing the solution multiplicity and goal path multiplicity values, task structure scores were computed (Fiedler, 1967), yielding overall structure scores of 5.43 for the TV task and 4.56 for the word task. The differences between the two task structure scores were shown to be significantly different from zero using a t test for correlated measures, t (33) = 3.94, $p < .05$. These structure scores indicate that, according to Fiedler's (1967) criterion, the TV task is structured and the word task is unstructured.

Since the rating procedure used in the present research is somewhat different from that reported by Shaw (1963) and replicated by Fiedler (1967), comparisons were made to assess the degree of comparability between the ratings resulting from each procedure. Scale values for the eight tasks common to the present work and Shaw's (1963) correlated quite highly: Product-moment correlations were .90, .82, .89, and .94 for the solution multiplicity, goal clarity, decision verifiability, and goal path multiplicity dimensions; Rank order correlations for the scale values on the same dimensions were .90, .90, .93, and .90, respectively. Slopes for all four regression lines were

found to be significantly different from 1.0, with *t* values of 2.51, 5.06, 5.61, and 2.65, respectively. These *t* values are significant beyond the $\alpha = .05$ level with *df* = 6. Since the slopes indicated scale values from the present procedure should not be compared directly to those obtained by Shaw (1963), appropriate predictor equations were determined and predicted scale values for the TV and word tasks were computed. These predicted values, which are comparable to Shaw's scale values, were 5.68, 6.74, 7.41, and 5.75 for the word task on each dimension, respectively, and 3.02, 6.06, 5.66, and 2.37 for the TV task. Recomputing the structure scores based on these scale values yielded a score of 5.58 for the TV task and 4.68 for the word task. These values indicate, as did the raw scale values, that the TV task is high in structure according to Fiedler's (1967) criterion, while the word task is low. This means, since the results of the main experiment showed the leader/member relations to be good and the leader's position power to be low, that when the groups were performing the TV task, they were operating in Fiedler's second octant, and when they were performing the word task, they were operating in Fiedler's fourth octant.

Since it was expected that, on the *sex bias* dimension, the TV task (mean = 4.97) would be seen as more appropriate for males, while the word task (mean = 3.88) would be seen as more appropriate for females, the hypothesis of no difference in ratings between the two tasks was tested using a

t test for correlated measures. Results indicated that the difference between the two tasks favored males ($mean_{difference\ score} = 1.09$) on the TV task, as expected, $t\ (33) = 3.96$, $p < .05$. To see whether males and females rated the tasks differently with respect to sex bias, two other correlated t tests were conducted. First, the average sex bias scores for the two tasks were computed and these average scores were tested for differences between male and female raters. The results of this test indicated that there was no difference between males and females in their overall level of sex bias ratings ($mean_{males} = 4.27$; $mean_{females} = 4.55$; $t\ (32) = .69$). Next, the difference scores between the two tasks were compared between males and females. This test revealed that the perceived difference in amount of sex bias was greater for males than for females, with the male subjects ($mean_{difference\ score} = 1.87$) rating the TV task even more appropriate for males than did the female subjects ($mean_{difference\ score} = .47$), $t\ (32) = -2.76$, $p < .05$.

Manipulation Checks

Because the final experimental model eliminated the time factor (see subsequent discussion of model reduction), manipulation checks were evaluated based on the reduced model. Several indices of manipulation effectiveness were examined.

Average group member ratings of the leader's structure and consideration behaviors were computed for each group, based on the subjects' responses to the corresponding LBDQ items. Means of these group rating scores indicated that leaders who were instructed to use a structuring style did, in fact, exhibit more structuring behaviors, while leaders who were instructed to use a considerate style showed more considerate behaviors. On the structure dimension, the mean for structure-oriented leaders was 27.41, and the mean for consideration-oriented leaders was 25.21, t (56)* = 2.81, $p < .05$. On the consideration dimension, the corresponding means were 41.66 and 45.41, t (56) = 4.69, $p < .05$.

Consideration and structure ratios, as explained previously, were calculated based on the observers' behavior tallies collected in 16 of the 64 groups. Mean ratios of structuring behaviors to overall leader behaviors were .592 for structure-oriented leaders and .285 for consideration-oriented leaders, t (8) = 5.30, $p < .05$. Corresponding means for the ratios of consideration behavior to overall behavior were .024 and .146, t (8) = 3.16, $p < .05$. Assignment to leadership condition accounted for 64% of the variance in the structure ratios and 34% of the variance in the consideration ratios.

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*All t ratios are computed using the MS within-cells for the 2(leader sexes) X 2 (leadership styles) X 2 (task orders) design.

Product-moment correlations between the group members' ratings of leader behavior and the observers' reports for the 16 observed groups indicated fair agreement between the two measures. Within-cells correlations for the consideration and structure scores were .45, $p < .10$, and .69, $p < .05$, respectively.

Experimenter records of whether the leader appointed someone to list words and to check words in the dictionary for the word task revealed that structuring leaders appointed listers in 31 of the 32 groups, while considerate leaders appointed listers in only 8 of 32 groups, χ^2 (1) = 34.72, $p < .05$. Similarly, structure-oriented leaders appointed word checkers in 17 of 32 groups, while consideration-oriented leaders appointed checkers in only 3 of 32 groups, χ^2 (1) = 14.25, $p < .05$.

Since the various measures of leader consideration and structure are in general agreement, and since all measures were significantly different in the directions predicted, it would appear that the leadership instructions were effective in manipulating leaders' consideration and structure behaviors.

Main Experiment

Model Reduction

Since the blocking factor (time period of participation) was considered a nuisance variable of no theoretical concern, tests were conducted to determine whether this

variable should be retained in the model. Because there was only one observation per cell when the time factor was included in the model, there was no appropriate within cells error term available for conducting statistical tests. Therefore, Tukey's test of nonadditivity, as recommended by Kirk (1968), was employed to determine whether the four-way interaction mean square might serve as the appropriate error term for all higher level tests. Due to the large number of dependent variables, some method of controlling the overall error rate for statistical tests was deemed desirable. This was accomplished by grouping the 31 interval dependent measures (Appendix L) into theoretically meaningful categories (effectiveness scores, rating scores, and strategy scores) and setting the overall error rate within categories at $\alpha = .25$ using Bonferroni's criterion. The relatively large alpha value was chosen to reduce the chances of a type II error, as recommended by Kirk (1968).

For the effectiveness scores, the test of nonadditivity resulted in F ratios of 5.87, 2.05, and 1.59, $df = (1, 6)$, on the TV, word, and penalty measures, respectively. Since the F value for the TV scores exceeded the critical criterion, the hypothesis of nonadditivity was rejected. Inspection of the TV scores revealed a moderate skew, which probably is reflected in the nonadditivity test. Since it was desirable to eliminate the effects of nonadditivity, a log transformation of the raw scores was implemented. This transformation had the desired consequence of eliminating

the nonadditivity, thereby allowing the use of the four-way interaction mean square as the error term in the subsequent tests for model reduction with this group of dependent variables.

Because there were numerous (23) rating scores, only the theoretically most important scores were examined in the model reduction procedure. Six variables were selected, including ratings of leader structure, leader consideration, group atmosphere, leader endorsement by the group, performance contributions of the leader, and overall group performance. Tukey's test of nonadditivity for these six variables resulted in F ratios, df = (1, 6), ranging from near zero to 6.02, none of which was significant by the stated criterion. Therefore, the four-way interaction mean square was adopted as the error term in further tests for model reduction involving this group of variables.

When Tukey's test of nonadditivity was applied to the five interval strategy measures (number of people who practiced TV tennis, practiced TV jai-alai, played the TV game for points, listed words, and checked words in the dictionary), the F ratios, df = (1, 6), ranged from near zero to 3.20, none of which was significant by the stated criterion. Once again, the four-way interaction error term was adopted for further model reduction tests with the strategy measures.

Multivariate analysis of variance (MANOVA) was used to conduct further model reduction tests. All MANOVA tests employed Rao's approximation of Wilk's lambda criterion. Once again, the critical value of alpha was set at .25 to minimize the probability of eliminating the time factor when it did have an effect, either as a main effect or in interaction with other variables.

The first MANOVA was conducted on the effectiveness (performance) scores. The hypotheses of no overall time effect and no effect for time in interaction with any other combination of independent variables were tested, resulting in F ratios ranging from .50 to 1.20, none of which was significant at the $\alpha = .25$ level with 21 and 14 degrees of freedom. Similar results were obtained for the rating measures, with F ratios ranging from .70 to 1.25 (df = 42, 12), and the strategy measures, with F values ranging from .56 to 1.02 (df = 35, 15). Since none of the F statistics was significant, the blocking factor, time, was dropped from all further analyses.

Approach to Analysis for the Reduced Model

The overall error rate for effects tested in the reduced model was controlled by conducting MANOVA tests for each of the three theoretically relevant groups of interval dependent measures mentioned previously. If a multivariate effect was significant at the $\alpha = .05$ level, corresponding univariate tests for each variable within the group were

examined. Cell means for these interval measures are presented in Appendix L. The approach for analzying the 22 frequency variables (Appendix M) is disucssed below.

Since there are currently no nonparametric analyses appropriate for analyzing factorial designs with more than two factors, the author chose to follow procedures suggested by Ott (1977) and Kirk (1968) for experiments of this nature. The procedures involved calculating relative frequencies for the occurrence of an event in each of the 2 X 2 X 2 = 8 cells and transforming these scores according to the following equation:

$$Y_{transformed} = \arcsin \sqrt{Y}$$

Such transformed scores have a known variance of 1/4n, where n equals the total number of opportunities for the event to occur. The transformed scores (Appendix M) are amenable to statistical analysis with conventional parametric techniques, using 1/4n as the error mean square with infinite degrees of freedom.

Because no appropriate variance/covariance matrix is available for testing MANOVA hypotheses for the transformed frequency data, results of the 22 univariate ANOVA's were examined in conjunction with the results from the MANOVA's for the interval data. The basic procedure was to test for significant main effects and interactions on the combined variable for the 31 interval measures, then to follow up these significant main effects by examining the univariate

effects on each of the 53 (i.e., 31 + 22) variables. Of course, specific a priori hypotheses were examined whether the multivariate effect was significant or not.

Leader Effectiveness (Group Performance) Scores

The MANOVA for the group performance variables is presented in Table 1. The predicted main effect for leadership style was observed, but the predicted main effect for sex and the sex X style interaction were not supported. Examination of the univariate analyses for the effectiveness scores (Appendix N) revealed a significant effect for leadership style on only one variable, TV score, where groups led by structuring leaders (mean = 194.94)* performed better than groups led by considerate leaders (mean = 137.91), F (1, 56) = 8.85, $p < .05$.

Group Members' Rating Scores

Table 2 is a presentation of the MANOVA for the ratings of the group members on Questionnaire 2 (Appendix E). Appendix O contains the corresponding univariate ANOVA'S. The raw scores for this analysis were the average ratings for all four group members, except for the ratings of the leader's behavior, where only group members other than the leader submitted ratings. For these latter scores, the average of the three followers ratings comprised the raw

*For ease of interpretability, the means and ANOVA for the raw TV scores are presented. The ANOVA for the log transformed TV scores presented the same pattern of results, with an F (1, 56) of 10.77.

Table 1

MANOVA: Effectiveness Scores

Source	Wilk's lambda	F^a
Leader Sex (S)	.9733	.49
Leadership Style (LS)	.8210	3.92[b]
Task Order (O)	.9911	.16
S X LS	.9838	.30
S X O	.9421	1.10
LS X O	.9956	.08
S X LS X O	.9420	1.11

[a] *df* numerator = 3; *df* denominator = 54.

[b] $p < .05$.

Table 2

MANOVA: Group Rating Scores

Source	Wilk's lambda	F[a]
Leader Sex (S)	.5779	1.08
Leadership Style (LS)	.3647	2.57[b]
Task Order (O)	.3853	2.36[b]
S X IS	.4758	1.01
S X O	.4612	1.73
LS X O	.6253	.89
S X LS X O	.5693	1.12

[a] *df* numerator = 23; *df* denominator = 34.

[b] *p* < .05.

scores. The general prediction tnat leader's sex should influence the ratings was not supported, nor was the prediction of an overall sex X style interaction. There was the predicted multivariate main effect for leadership style, with significant univariate effects for style on the variables presented in Table 3.

There was also a significant multivariate main effect for the task order. Corresponding significant univariate effects are presented in Table 4.

A priori hypotheses concerning rating scores were evaluated using the t statistic.* These results are examined in the next several paragraphs.

Ratings of group performance failed to support the predicted advantage for female-led groups, with the mean performance rating (where 1 = very well and 7 = not very well) for male-led groups on the first task being 3.22 as opposed to 2.91 for female-led groups, t (56) = 1.36. Corresponding means for the second task were 3.54 and 3.35, t (56) = .63.

The prediction that male leaders would be seen as more influential than female leaders was supported. In response to the question, "To what extent do you feel the group's performance was due primarily to the performance of the leader?" members of male-led groups gave an average rating

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*All t ratios are computed using the MS within-cells for the 2 (leader sexes) X 2 (leadership styles) X 2 (task orders) design.

Table 3

Rating Scores with Significant
Univariate Main Effects for Leadership Style

Variable	Mean Consideration	Mean Structuring	Univariate $F^{a,b}$
Group Atmosphere (higher score is more favorable)	70.56	68.11	5.17
Leader Consideration[c] (higher score is more considerate)	45.41	41.66	22.03
Leader Structure[c] (higher score is more structuring)	25.21	27.41	7.90
Individual Performance on First Task (higher score is better)	4.29	3.85	5.61
Enjoyment of Working with Group (higher score is greater enjoy.)	6.20	5.91	4.00
Leader Power (higher score is more power)	3.52	4.38	16.71

[a] *df* for all *F*'s = (1, 56).

[b] All *F* ratios significant at or beyond $\alpha = .05$.

[c] Also served as manipulation check.

Table 4

Rating Scores with Significant
Univariate Main Effects for Task Order

Variable	Mean TV Task First	Mean Word Task First	Univariate $F^{a,b}$
Group Performance: 1st Task (lower score is better rating)	3.46	2.67	12.35
Individual Performance: 1st Task (higher score is better rating)	3.82	4.32	7.17
Individual Responsibility for Group Performance (higher score is more)	4.46	4.14	6.22
Structure of 1st Task (lower score is more structure)	2.92	2.48	6.30
Ways to Perform 1st Task (higher score indicates more ways)	3.89	4.63	7.21
Ways to Perform 2nd Task (higher score indicates more ways)	4.61	3.51	15.82

[a] *df* for all *F*'s = (1, 56).

[b] All *F* ratios significant at or beyond $\alpha = .05$.

(seven point scale; 1 = not at all due to leader, 7 = totally due to leader) of 4.21, while members of female-led groups gave an average rating of 3.84, t (56) = 1.69, $p < .05$.

Leader responses to two questionnaire scales were examined to test the prediction that male leaders would rate the group situation less favorably than female leaders. The prediction was supported by both the group atmosphere rating, where the mean for male leaders was 67.41 as opposed to 72.88 for female leaders, t (56) = 2.88, $p < .05$, and the leaders' ratings of how much they enjoyed working with the group, where the corresponding means were 5.84 (on a seven point scale) and 6.47, t (56) = 2.24, $p < .05$.

As predicted, male leaders were more critical of their groups' performances than female leaders. Male leaders indicated that they were less satisfied with their groups' overall performances (mean = 2.94 on a seven point scale with lower score indicating greater satisfaction) than were female leaders (mean = 2.16), t (56) = 2.28, $p < .05$. Apparently, this negative bias decreased as the leader worked longer with the group. On the ratings of how well they thought their groups performed, male leaders rated their groups significantly worse (mean = 3.09 on a seven point scale with lower score indicating better performance) than female leaders (mean = 2.41) on the first task during the session, t (56) = 1.97, $p < .05$, but for the second

task there was no difference in performance ratings between male and female leaders (means = 3.47 and 3.13, respectively, t (56) = .83). Contrary to prediction, male leaders rated their own performances better than did female leaders. Mean ratings of their own performances on the first task were 4.25 (on a scale of seven, with higher score indicating better performance) for male leaders and 3.69 for female leaders, t (56) = 1.34. While this difference was not significant for the first task, the difference in ratings was significant for the second task ($mean_{male\ leaders}$ = 4.50, $mean_{female\ leaders}$ = 3.31), t (56) = 2.57, $p < .05$.

The prediction that female leaders would be more favorably endorsed by the group when compared to male leaders was not supported. In response to the question, "Do you think your leader deserved the leadership position?" followers of female leaders were actually less supportive (mean = 2.65 on a seven point scale where lower score indicates more deserving) than followers of male leaders (mean = 2.19), t (56) = 1.86.

None of the predicted interactions between leader sex and leadership style was supported by the data. The follower ratings of leader structure for female leaders using a structuring style (mean = 27.88) were not significantly higher than ratings for male leaders using the same style (mean = 26.94), t (56) = .85; corresponding means for female and male leaders using a considerate style ($mean_{female}$ = 44.73, $mean_{male}$ = 46.08) were likewise not significantly

different, t (56) = 1.19. Similarly, the group atmosphere ratings under structuring female leaders (mean = 68.78) were not significantly lower than those for considerate female leaders (mean = 70.23), t (56) = .95; nor were group atmosphere scores for groups with structuring male leaders higher than those for groups with considerate male leaders. In fact, the opposite was true, with considerate male leaders producing higher group atmosphere scores (mean = 70.89) than structuring male leaders (mean = 67.43), t (56) = 2.26, $p < .05$. Scores on the scale indicating how much followers thought their leader deserved the leadership position (lower score indicates more deserving) likewise revealed no difference in follower endorsement of the leader based on an interaction of leader sex and leadership style. Mean endorsement scores for female leaders using the structuring versus considerate styles were 2.48 and 2.81, respectively, t (56) = .95, while corresponding means for male-led groups were 2.35 and 2.02, t (56) = .95.

Finally, the prediction that female followers would rate their leaders as more considerate than would male followers was supported. Mean consideration scores for female versus male followers were 43.95 and 42.73, respectively, t (112) = 1.67, $p < .05$.

Strategy Scores

The MANOVA for strategy scores is presented in Table 5. Univariate analyses for all strategy variables may be found

Table 5

MANOVA: Strategy Scores

Source	Wilk's lambda	F^a
Leader Sex (S)	.8227	2.24
Leadership Style (LS)	.6716	5.09[b]
Task Order (O)	.9530	.51
S X LS	.9171	.94
S X O	.8446	1.91
LS X O	.8543	1.77
S X LS X O	.9467	.59

[a] *df* numerator = 5; *df* denominator = 52.

[b] $p < .05$.

in Appendix P. As may be seen in Table 5, the only multivariate effect which attained significance was for leadership style. There were significant leadership style effects on three univariate variables: number of group members playing the TV game, number of group members listing words in the word game, and number of group members checking words in the dictionary. Groups with structuring leaders, as predicted, used fewer players on the TV task (mean = 2.81) when compared to groups with considerate leaders (mean = 3.50), F (1, 56) = 14.52, $p < .05$. The mean number of word listers in considerate-leader groups was 1.69, as opposed to a mean of 2.44 for structuring-leader groups, F (1, 56) = 4.69, $p < .05$. Corresponding means for the number of word checkers were 1.00 and 1.38, F (1, 56) = 4.34, $p < .05$.

The data failed to support the prediction that structuring leaders would allow more group members to practice so that the leader could select the best qualified group members for each position. The mean number of players practicing for TV jai-alai was 3.00 under structuring leaders as compared to a mean of 3.25 for considerate-leader groups, t (56) = .82. Corresponding means for the number of players practicing TV tennis were 3.56 and 3.44, t (56) = .71. As predicted, structuring leaders did appoint group members to specific duties more often than considerate leaders, however. Transformed scores (as described previously) for the frequency of the leader's appointing word listers were higher for structuring leaders (mean = 1.33)

than for considerate leaders (mean = .52), t (inf.) = 6.48, $p < .05$. Comparable mean scores for the frequency of the leader's appointing word checkers were .82 and .31, t (inf.) = 4.07, $p < .05$.

Because the multivariate effect for leadership style was significant for the interval dependent measures, the effects of leadership style on the remaining frequency variables (for which no *a priori* hypotheses had been stated) were examined using the per comparison error rate. Under this criterion, four frequency measures of strategy were significantly different for structuring, as opposed to considerate, leadership groups. These variables were the number of female TV players ($mean_{transformed,\ structure} = .75$; $mean_{transformed,\ consideration} = 1.11$; F (1, inf.) = 15.97, $p < .05$), the number of times groups hid one paddle for TV jai-alai while the other paddle was supposed to be hitting the ball ($mean_{transformed,\ structure} = 1.07$; $mean_{transformed,\ consideration} = .82$; F (1, inf.) = 4.38, $p < .05$), the number of groups in which all members called words to a single word lister ($mean_{transformed,\ structure} = .79$; $mean_{transformed,\ consideration} = 1.10$; F (1, inf.) = 6.43, $p < .05$), and the number of male word listers ($mean_{transformed,\ structure} = .87$; $mean_{transformed,\ consideration} = .62$; F (1, inf.) = 7.68, $p < .05$).

Since it was suspected that the two tasks would be seen as different in appropriateness for male and female

subjects, the relative numbers of each sex performing specific task duties were examined. Difference scores (number of males - number of females) were computed for each of the three specific task positions (TV player, word lister, word checker). These scores were first subjected to *t* tests for correlated measures, testing the hypotheses that the difference scores on the three variables were significantly different from zero.* The resulting *t* ratios were 6.21 (*df* = 56, *p* < .05) for the TV player scores, 1.30 (*df* = 56) for the word checker scores, and -2.67 (*df* = 56, *p* < .05) for the word lister scores. These results indicate that there were significantly more male TV players and significantly fewer male word listers. The difference scores were then subjected to a MANOVA to test for the effects of the independent variables on the distribution of members of the opposite sex in various task duties. The MANOVA indicated that there were significant overall effects for leader sex, F (3, 54) = 3.78, $p < .05$, leadership style, F (3, 54) = 3.35, $p < .05$, and the task order X leadership style

*Harris (1975) has noted that the calculated T^2 in such a multivariate situation is greater than or equal to the square of the largest of the univariate *t* ratios. Therefore, if the square of any of the univariate *t* ratios exceeds the critical value of T^2, one knows that the calculated T^2 would also exceed the critical value. Since the square of one of the calculated *t* ratios (= 38.56) exceeded the critical T^2 (= 8.28), no T^2 test was conducted to control for overall error rate.

interaction, F (3, 54) = 3.01, $p < .05$. Univariate analyses (Appendix Q) revealed univariate effects as follows: More females were used as word listers when the leader was female ($mean_{difference\ score,\ female\ leader} = -.531$; $mean_{difference\ score,\ male\ leader} = .031$; F (1, 56) = 10.31, $p < .05$); more males played the TV game when the leader was structuring ($mean_{difference\ score,\ structure} = .938$; $mean_{difference\ score,\ consideration} = .344$; F (1, 56) = 9.46, $p < .05$); none of the univariate interactions between task order and leadership style was significant at the .05 level.

LPC Scores

The possibility that the LPC scores for the leader might significantly affect the leader effectiveness scores, despite the manipulation of leadership style, was examined via analysis of covariance. The primary effectiveness scores (scores on the word and TV games) were entered into the analysis as dependent variables, with leader sex, task order, and leadership style as the independent variables, and leader's LPC score as the covariate. This analysis revealed a nonsignificant test of within cells regression for both the word score, F (1, 55) = .56, and the TV score, F (1, 55) = 1.59. The raw regression coefficient for the word score was -.098, and for the TV score it was -.153. Regression coefficients were calculated separately within each of the leadership styles to see whether predictability

would improve. Under the structuring leadership condition, the regression coefficient was -.049 for the word score and -.247 for the TV score. Under the considerate leadership condition, the corresponding regression coefficients were -.126 and -.163. None of the regression coefficients was significant at the $\alpha = .05$ level.

The prediction that male subjects would score lower than female subjects on the LPC measure was not supported. Males scored an average of 63.05, while the average for females was 65.28, $\underline{t}$ (254) = 1.17.

CHAPTER IV

DISCUSSION

It is customary in the discussion of research to evaluate the results in light of relevant theoretical and practical considerations, to enumerate appropriate cautions on the interpretation of the results and attendant evaluations of those results, and to consider possible directions for future research in the area of interest. In this chapter, each of these concerns will be addressed in an attempt to integrate the findings from the present research into our general body of knowledge in the areas of leadership and attribution of performance differences based on gender. First, let us consider the present results in relation to the theories and research discussed in earlier chapters of this paper.

Theoretical and Practical Considerations

In our introduction to the present research, we posed three questions that have been of general interest to social scientists investigating the problem of how the leader's sex affects his/her performance, effectiveness, and perception by others. The question of whether male leaders and female leaders usually behave differently was not addressed directly in the present research. Instead, leadership

behaviors of leaders from both sexes were manipulated experimentally, and the impact of these different leadership behaviors on the other two questions of general interest (i.e., first whether the leader's sex influences the followers' reactions to the leader, and second whether leader's sex has an effect on group performance) was examined in a particular group/task situation. Before we interpret our results regarding how the leader's sex and leadership behavior influence follower responses, let us define the group/task situation in terms of Fiedler's contingency theory.

Favorability for the Leader

Based upon the results of the task rating procedure, the group atmosphere scores, and the measure of leader position power, we may place the favorability for the leader into two different octants from Fiedler's theory, depending on which of the two tasks the group was working on. The average group atmosphere rating of 69.34 places the leader/member relations in the "good" category according to Fiedler's (Fiedler & Chemers, 1974) criterion; the supposed lack of leader power based on Fiedler's checklist (i.e., can the leader hire/fire, etc.) and the moderate ratings of leader power by the group members (mean = 3.95 on a seven-point scale) indicate that the leader power should be considered "weak"; however, the task structure rating for the TV task is above Fiedler's criterion for high structure (TV structure score = 5.58; Fiedler's criterion for high structure =

5.0 or greater), while the task structure for the word task (score = 4.68) fails to reach this criterion. Therefore, for the TV task, we are operating in Fiedler's second octant (good leader/member relations, structured task, weak position power), but for the word task we are operating in the fourth octant (good leader/member relations, unstructured task, weak position power).

The reader may recall that the author intended to place the favorability for the leader in the second octant. Preliminary tests had indicated that both tasks would be perceived as highly structured; however, final task ratings failed to sustain this early impression, with the word task falling just short of Fiedler's stated criterion. Since Fiedler's model has no place for moderate structure, we must evaluate the results (if we are to use Fiedler's model) from the viewpoint of high favorability for the leader on the TV task and moderate favorability for the leader on the word task.

Another aspect of the tasks, which Fiedler does not consider, but which may be of relevance in the study of sex effects in leadership, is the perceived sex bias of the task. In our results, we found that the TV task was perceived as more male-oriented than the word task, especially by male raters. This perception probably influenced the groups' behaviors to some degree; for example, as evidenced in the significantly larger proportion of males, as opposed

to females, playing the TV games. It is not known how this sex bias might affect the favorability for the leader.

Keeping in mind these factors, let us turn our attention from the group/task situation to the followers' reactions to the leader, and how these reactions affect the groups' perceptions of the situation.

Follower Reactions to the Leader and the Situation

While many variables may influence how followers react to their leaders, we have chosen to concentrate on two factors: the leader's sex and leadership style. The literature suggests (e.g., Frank & Katcher, 1977; Bartol & Butterfield, 1976; Rosen & Jerdee, 1973) that followers do respond differentially in their evaluations of the leader and the group situation based upon the leader's sex and leadership style. In the present research, we found evidence to support a moderately strong influence for leadership style, but only weak evidence of an effect for leader's sex. The predicted interaction between these two variables garnered even less support. Before considering the ramifications of our findings concerning leadership style, perhaps a summary of the relevant results would be in order.

Looking at the results on the rating variables, we find that the group members perceived the differences in consideration and structuring behaviors of the leaders veridically, and that their accurate perceptions were not influenced, as Lee and Alvares (1977) found, by the sex of

the leader. Furthermore, groups* with considerate leaders, as compared to groups with structuring leaders, rated the group atmosphere as better, their enjoyment of working with the group as higher, and their individual performances on the first task as better. On the other hand, groups led by structuring leaders rated the leader's position power greater than did groups led by considerate leaders.

As might be expected, groups responding to structuring leaders exhibited different approaches to the tasks from groups responding to considerate leaders. In general, these different strategies involved varying alignments of group members with particular tasks based on the number and sex of participants. Groups with structuring leaders used fewer members in specific TV positions, but more members in specific word positions, when compared to groups with considerate leaders; structuring-leader groups used more males in specific positions on both tasks. In addition, groups with structuring leaders were more likely to use the more efficient strategy (in the author's opinion) of hiding one of the TV paddles during the jai-alai game when it was the other paddle's turn to hit. This strategy reduced the confusion associated with the game and may have contributed to the better performance of the structuring-leader groups

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*The reader may recall that the group rating scores for the next several variables discussed included the leaders' ratings; however deletion of the leaders' ratings had no effect on the significance tests.

on the TV task. Finally, groups with considerate leaders were more likely to have all group members call their words to a single word lister than were groups with structuring leaders.

How might we come to some integrated understanding of these results? It appears that the groups were responding in a logical way to the information provided by leaders using the two different leadership styles: Their perceptions of the leaders' behaviors were accurate; their ratings of the group atmosphere were in consonance with the more relaxed atmosphere implied by a less structuring leader; and their ratings of structuring leaders as more powerful are probably based (as Fiedler & Chemers, 1974, noted) on the fact that structuring leaders acted as if they had more power.

As concerns the differences in strategy between structuring-leader and considerate-leader groups, the strategies adopted seem to be consonant with the leadership styles and the groups' perceptions of the situation. For example, the facts that structuring leaders used fewer players and proportionately more male players on the TV task might readily be understood in light of two factors: first, the stereotypic sex bias favoring male players on the TV task; second, the fact that structuring leaders should be more concerned with task performance than considerate leaders and less concerned with involving everyone in the task. If, indeed,

the structuring leaders perceived that male players were likely to do better on the task, it is not surprising that such leaders would use male players to the exclusion of female players if their main concern was to score as well as possible on the task. Such a task-orientation may also account for the fact that the structuring leaders seemed to be more concerned with having more specific assignments of duties. The use of the more efficient jai-alai strategy by groups with structuring leaders as opposed to groups with considerate leaders may be due to the fact that males, perhaps due to greater task familiarity, were actually better TV players, using more efficient strategies. This logical information processing model has been applied to other aspects of group functioning, such as attribution of responsibility (Bem, 1972; Miller & Ross, 1975; Schlenker & Miller, 1977). Now, let us examine the effects of the leader's sex on the groups' responses and see if our logical information processing interpretation continues to be useful. Since the leader's impressions of the group situation are likely affected by the followers' responses, we shall examine leader impressions and follower reactions concurrently.

The MANOVA's failed to indicate an overall effect for leader sex on any of the relevant groups of dependent variables. However, since several a priori hypotheses were posited, the results for specific dependent variables, as indicated by the hypotheses, were examined. Results

supporting a priori hypotheses revealed that male leaders were considered more influential or responsible in the group's performance, that male leaders perceived the group atmosphere as less favorable than female leaders, that male leaders were more critical of their groups, and that female followers saw their leaders as more considerate. The first result fits nicely with our information processing interpretation: male leaders were very likely more responsible for the group's performance due to the fact that they more often participated in the "skilled" positions on the TV task. The male leaders' negative impressions do not seem to have any objective foundation; group ratings of group atmosphere were not different for male-led versus female-led groups, nor did groups with leaders from one sex perform better than groups with leaders of the other sex. The likely explanation for these differences between male and female leaders is that they are manifestations of sex stereotypes, as proposed by Jacobson and Effertz (1974). Finally, the more optimistic view of their leaders shown by female followers may be a product of sex stereotyping in socialization, where females are expected to be more nurturant (Parsons & Bales, 1955).

The failure of group ratings of their own performance to show a significant advantage for female over male leaders is not in accord with the findings of Jacobson and Effertz (1974), although the differences in mean ratings in the present experiment were in the direction predicted from Jacobson and Effertz's work. Perhaps differences in the tasks,

subjects, procedures, or outcomes led to the failure to replicate these earlier results. Future research may shed further light on the question. The failure to replicate Jacobson and Effertz's (1974) finding that male leaders are more critical of their own behavior may be due to the fact that in the earlier study, the groups led by leaders of either sex performed relatively poorly, with rather uniform participation of both sexes, while in the present study, the groups generally thought that they had done well, and male leaders were more likely to participate in the TV games than female leaders. Thus, males had logical grounds upon which to base their ratings of superior individual performance.

The failure to reproduce any of the predicted interaction effects based on leader sex and leadership style may be seen as not supporting Parsons and Bales' (1955) theory that men and women in our society are expected to have different approaches to leadership. Several explanations may be offered for this failure to confirm previous findings (Lee & Alvares, 1977; Bartol & Butterfield, 1976; Bullard & Cook, 1975; Petty & Lee, 1975) which supported Parsons and Bales' view. It could be that, with more emphasis on the women's movement and greater awareness of sex stereotyping, the population (especially in a university setting) is changing its attitudes toward what is the "appropriate" role for women. Even if there is no real attitudinal change, there could be a reluctance on the part of "educated"

persons to appear chauvinistic about sex roles. Thus, subjects may have responded to societal pressures not to act in a bigoted manner (even though subjects were assured their responses to the rating scales were anonymous). Another possible explanation is that college students used as subjects in the present study are significantly different from students serving as subjects in the research cited previously. This is a possibility, since some of these researchers used only business or management students, and some subjects were not students at all. The present sample consisted of students from many fields. We should be able to evaluate some of these alternative explanations as more studies on women's leadership are conducted in different settings and with different subject populations.

Before considering how the leader's sex and leadership style affected the group performance, some brief mention should be made of the overall significant main effect for task order on the MANOVA for group rating scores. Since task order was not of theoretical interest, no hypotheses were stated concerning this variable. However, some of the results on the univariate variables contributing to the overall multivariate effect may be of practical interest.

First, group members agreed with the judges of the task structure that the word task allowed for more possible solutions than the TV task. This one dimension was the strongest contributor to the difference in rated structure between the two tasks. Since group members rated the TV

task lower in goal path multiplicity regardless of the order of task presentation, we may interpret this effect as a function of the task itself, and not of task order. Other ratings do reflect an effect for task order per se, however.

It is interesting, for example, that groups participating in the TV task first rated their performance on the TV task as being worse than their performance on the word task. However, groups rated their performances on the second task, regardless of whether this task was the TV task or the word task, as being equally good. We would expect, for consistency's sake, that the ratings on the second task would be a mirror image of the ratings of the first task; the performance on the TV task, when it was the second task, should have been rated worse than the performance on the word task, when it was second. Similarly, group members rated their individual performances as better on the first task when the word task was first, but showed no differences in their assessments of individual performance on the second task, regardless of which task came second. Furthermore, group members assumed less individual responsibility for first task performance when the word task came first, and saw the first task as more structured when the word task came first, while at the same time rating individual responsibility and task structure as equivalent for the second task, regardless of whether that task was the TV task or the word task. Since there were no actual performance differences based on task order, we suggest that these varying impressions may

be a function of the development of group norms during the experimental session. Perhaps individual subjects were more sensitive to performance deficits during the early part of the session, before evaluative norms were established, and were more critical of early performance. Later, after group performance norms had a chance to develop, subjects may have been less critical as a function of the support provided by other group members ("We didn't do too bad that time." "Yeah!" etc.). At any rate, we should view these results as indicating that caution is required in interpreting group members' ratings of task performance when more than one task is used in an experimental session.

We shall now turn our attention to the effects that leader sex and leadership style had on group performance.

Leader Effectiveness

It is obvious that the only independent variable affecting the group performance, or leader effectiveness, was the leadership style. Furthermore, leadership style affected only the performance on the TV task, with groups under structuring leaders performing better than groups under considerate leaders. These results appear to be in agreement with Fiedler's contingency theory.

We have seen that the situation for the leader was favorable for the TV task, but only moderately favorable for the word task. Thus, for the TV task, we would predict from Fiedler's theory that a task-oriented (structuring) leader

would be more effective, just as was observed. However, for the word task a considerate leader should have been more effective. The mean scores on the word task differed in the direction predicted by the theory, despite the fact that the mean difference was not statistically reliable ($mean_{structure}$ = 48.75; $mean_{consideration}$ = 52.47; F (1, 56) < 1). Fiedler (1967) reports that correlations between LPC scores (i.e., relations-orientation) and performance may requently be of zero order in octant four, though a moderate positive correlation is observed most often. Thus, the results obtained in the present study are within the range of those reported by Fiedler and his associates. It is unfortunate that we are unable to locate the favorability for the leader more precisely along Fiedler's proposed continuum. It seems somewhat arbitrary to designate as "unstructured" a task which judges rate above the mid-point on a rating scale for structure, as we are forced to do with the word task in the present experiment when we apply Fiedler's criterion of task structure. Definite refinements in Fiedler's theory would be in order to increase the sensitivity of the favorability measures.

We might ask what factors about the leader's leadership style were important contributors to the difference in performance between groups led by leaders using opposite styles. Fiedler and Chemers (1974) consider this question in some detail for leaders using their natural, or preferred

leadership style. Their conclusion is that the differences in group performance result from differences in personality orientation of the leaders in interaction with the situation at hand. In the naturally occurring leadership situation, there may well be a tendency for leaders who score high on the LPC to perform one way, while low-LPC leaders act in a different manner. In the present experiment, the experimental manipulation of leader behavior apparently overrode any tendency to lead in the preferred natural style, since leaders' LPC scores were not significant predictors of group performance. The leadership style manipulation appeared to make structuring leaders more selective in their choices for TV players. They used proportionately more male players than considerate leaders, while at the same time using fewer total players. It would seem that the structuring leaders selected (accurately) the players who performed best on the specific TV task, perhaps because of better strategy or more familiarity with the task, and allowed these players to participate fully in the task while relegating other group members to an observer status.

Apparently, violations of sex role stereotypes for leadership, if indeed such violations did occur, were not a significant factor in influencing group performance. Leaders of either sex were equally effective, and there was no evidence of an interaction between the leader's sex and leadership style. These results fail to support Parsons and Bales' (1955) theory of appropriate sex roles. Our

assumption that sex role stereotypes may reduce favorability for female leaders may be unfounded, at least within the constraints of the present combination of group atmosphere, task structure, and leader power, and with small groups composed of college students of both sexes in equal numbers (our previous discussion on the failure to observe the predicted interactions on the rating variables is relevant to this point). Though we lack information concerning how the interaction of leader sex and leadership style affects group performance in a large variety of populations and situations, it appears that presumed sex stereotypes are not universally debilitating for female leaders using "male" leadership styles.

Limits on Interpretation of the Results

Some may be tempted to over-generalize the present results, making inferences that are not justified. Indeed, it would be encouraging to conclude that sex stereotypes are no longer a problem for women leaders. Unfortunately, there are numerous reasons not to reach such a conclusion. We shall consider some of these reasons in the next several paragraphs.

As is obvious from the discussion concerning the placement of the present group interactions along the favorability for the leader continuum, we have examined leadership within a relatively narrowly defined set of circumstances. Perhaps in group/task situations where the

circumstances are different, for example where the situation is highly unfavorable for the leader, or where the group size and sex composition are different, we might find that the leader's sex, either alone or in concert with other factors such as leadership style, will significantly affect the group performance. Perhaps longer (or shorter) term interaction between the leader and the group would reveal significant performance decrements (or increments) as a function of the leader's sex. Certainly, numerous group/task situations should be observed before we might conclude that sex stereotypes of appropriate leadership roles are passé.

A related problem is the fact that the present research was conducted in a rather artificial leadership setting. The participants really had very little vested interest in the outcome of the interaction. Though the tasks used were selected because of their high degree of intrinsic interest for the subjects participating, there was certainly no overwhelming reason for the groups to be concerned over whether they performed well or poorly. Perhaps when the "stakes are higher" sex stereotypes will surface as a significant problem in the leadership situation.

Probably one of the most compelling reasons not to extend the conclusions from the present study to the society at large is the fact there are likely profound differences between college students, in an academic setting, and people in general, in various work settings. College students not only have access to educational sources which may not

influence the general public, they are imbedded in a setting where they observe numerous competent women leaders on a daily basis. Thus, their educational and experiential inputs may be quite different from the typical working person. Therefore, the college student may be in the vanguard in acceptance of social changes, such as the emergence of women in various leadership roles using task-appropriate rather than sex-appropriate leadership styles.

While the problems discussed above prohibit reckless generalization of the present results to different leadership settings, they also serve to point the way for possible future research on sex stereotypes in leadership. We shall discuss some of these possibilities, along with possible research on leadership style, in the next section.

Directions for Future Research

We know very little about what factors may be important in influencing the effectiveness of women leaders. The present study adds to the body of knowledge but certainly more questions are raised than are answered. As a society, we probably face a burgeoning of women leaders. As social scientists, we should be prepared to deal with some of the social problems which will most likely attend the rise of women leaders in our government, our economy, our armed forces, and our society in general. Some of the questions we should answer are suggested by the present research.

For example, if some leadership settings show relatively little effect for sex stereotyping, as we found in our setting, are there other settings where sex stereotypes do impair leader effectiveness? Are there populations which are particularly susceptible, or resistant, to sex stereotypes? What are the effects of different group sizes and sex constituencies on leaders of different sexes? What might be expected if different levels of favorability of the situation for the leader had been used in the present research? Are sex role stereotypes diminishing in our society, and if they are, how fast and to what degree? Would leadership styles other than those considered be more effective for women leaders? These questions and many more indicate that we are on the tip of an iceberg of possible research questions concerning leadership in women.

Perhaps the ocean is warming around our iceberg--perhaps the attitudes of our society are changing so rapidly that many of the questions we face at present will melt away in the heat of irrelevancy before the social scientist has a chance to address them. Time will tell. But until we know, these questions loom large, and fraught with practical relevance.

Of course, there are many questions which we have not answered about leadership in general. As was noted earlier, Fiedler's contingency theory, though it offers us the prospect of a useful integrating principle, needs development and refinement, such as more continuous measures of

favorability for the leader and better integration with other leadership research. The present research is a step in the latter direction, since we have made the conceptual leap from Fiedler's personality measure (LPC) to Stogdill's behavioral description (LBDQ) and found that the behaviors described in the LBDQ can be used as models for simulation of the high and low LPC leaders described by Fiedler, with resulting effects on group performance very much in line with what Fiedler's contingency theory predicts. Perhaps with increasing numbers of constructual validations, such as in the present experiment and in that reported by Shaw and Blum (1966), more impetus toward improvement of Fiedler's theory will be generated.

In conclusion, we may do well to note that the study of sex effects in leadership can help us understand leadership in general, whether or not sex stereotypes persist in our society. As was attempted in the present research, we may view sex stereotypes in the context of more general influences on leadership, such as the favorability of the situation for the leader. We proposed that the operation of sex role stereotypes would wax against the effectiveness of women leaders; our proposal was not supported in the present situation. Nevertheless, we may have helped, in some small way, in pointing the way toward a more refined view of what favorability for the leader does entail. As our understanding of the favorability dimension grows, perhaps our

understanding of leadership processes in general will be enhanced. We would hope that this will be the case.

CHAPTER V

SUMMARY

Social scientists have long been interested in studying leadership and the effects of gender on performance and impressions. The emergence of women in leadership positions in our culture makes the study of these factors particularly important today.

A number of social scientists have substantiated various sexual stereotypes which are common to western society. Unfortunately, little research has been conducted which seeks to understand how these stereotypes may influence the effectiveness of leaders of the opposite sex differentially. Effectiveness, following Fiedler (1967), is considered to be reflected in the measure of group productivity, whatever that may be. Most research on sex stereotypes in leadership has concentrated either on follower impressions and attitudes or on cataloging differences in behavior between male and female leaders. Thus, more research is needed which seeks to answer the practical question of whether the leader's sex, either alone or in concert with other variables, has a significant impact on his/her effectiveness.

Contemporary theories of leadership are, for the most part, interactional in nature. Leadership is conceived as

a social influence process involving the interaction of characteristics of the leader, the followers, and the situation. Perhaps the most prominent of these theories is the contingency theory of leadership proposed by Fiedler (1964; 1967). Fiedler proposes that the leader's effectiveness is contingent upon his/her style of leadership in interaction with the favorability of the group/task situation for the leader. Two major styles of leadership, task-oriented and human relations-oriented, are considered in Fiedler's theory. These styles seem to be described by other authors as autocratic versus democratic, authoritarian versus nonauthoritarian, supervisory versus participatory, directive versus non-directive, and structuring versus considerate (Shaw & Costanzo, 1970). In the present work, we sought to understand how the leader's sex and stereotypes about what may be appropriate sex role behaviors for women, versus men, leaders may influence the interaction between leadership style and situational favorability in determining group performance for small, mixed-sex groups.

After reviewing relevant research and considering the propositions of Fiedler's theory, as well as the proposal by Parsons and Bales (1955) that male leaders are expected to be instrumental (structuring) while female leaders are expected to be expressive (considerate), the author designed an experiment in which leader effectiveness could be observed as a function of the leader's sex and leadership style. A randomized blocks factorial design was employed

in which leader sex (male, female), leadership style (structuring, considerate), and task order (task A first, task B first) were the independent variables. The blocking factor was the time of the academic quarter when the groups participated in the experiment. Since the blocking factor appeared not to affect the results significantly, it was subsequently dropped from the model. Dependent variables were 31 interval measures and 22 frequency measures of the groups' performances on the tasks, task strategies, and impressions.

Preliminary testing had indicated that the tasks, in terms of Fiedler's contingency theory, were structured, the leader/member relations were good, and the leader position power was weak in the leadership situation established for the present experiment. Final ratings by judges not involved in the experiment confirmed these preliminary results for one task, a television game in which the players were required to hit an electronic ball back and forth with electronic paddles for as long as possible (task A). For the other task (task B), a word game in which group members were expected to make as many words as possible from a given configuration of letters, the preliminary ratings of leader/member relations and leader power were confirmed, but the task failed to reach the criterion established by Fiedler for a task to be considered structured. Therefore, for the TV task, the favorability for the leader was, as the author had intended, in the high range according to Fiedler's

theory; for the word task, the favorability fell [illegible] t[illegible] moderate range. Fiedler's theory makes divergent predictions as to which leadership style will be most effective in these two favorability ranges. In the former range, Fiedler says that task-oriented (structuring) leaders are more effective; in the latter range, human relations-oriented (considerate) leaders are said to be more effective.

Besides having different structure levels, the two tasks used were rated by judges as different in appropriateness for male participants as opposed to female participants. While the word task was rated as essentially equally appropriate for both males and females (or perhaps slightly favoring females), the TV task was seen as favoring male players. As is discussed later, this sex bias seems to have affected the strategies chosen by the groups in working on the task.

Based on the author's preliminary assumption that the favorability for the leader would be in the high range, and upon the previous research and theory, several hypotheses concerning the effects of leader sex and leadership style on the dependent variables were posited. These hypotheses were divided into three classes, depending upon the type of outcome measures observed (i.e., performance measures, participant ratings, and strategies used). The author proposed that where the favorability for the leader is high, the following effects on group performance will be observed:

(1) Structure-oriented leaders will be more effective than consideration oriented leaders;

(2) Male leaders will be more effective than female leaders; and

(3) These main effects will be tempered by an interaction between leader sex and leadership style, with male leaders being more effective using a structuring style and either sex being equally effective using a considerate style.

For the participant rating measures, the following hypotheses were proposed:

(4) The leader's sex will significantly affect the group members' ratings of the group interaction and of the leader's behavior. Furthermore, male and female leaders will differ in their perceptions of the group interaction;

(5) Structuring leaders will be accurately rated by group members as more structuring than considerate leaders, while considerate leaders will be rated more considerate than structuring leaders;

(6) Leader sex and leadership style will have an interactive effect upon the group members' ratings of the leader and the situation; and

(7) Female followers will rate their leaders more considerate, when compared to male followers.

One main hypothesis concerning strategy was posited:

(8) Structuring leaders will be more concerned with getting the group organized and efficiently directed toward

the task goal, while considerate leaders will be more concerned with involving all group members in the task and allowing each person to contribute to the task strategy.

Finally, a hypothesis concerning Fiedler's measure of personality, the Least Preferred Coworker Scale (LPC), which is said to measure task- and human relations-orientation, was offered:

(9) Males will, in general, be more task-oriented than females.

Briefly, the procedures for the experiment were as follows:

Groups composed of two males and two females were formed from 256 undergraduate volunteers solicited via posted sign-up sheets and participating in partial fulfillment of a course requirement for experimental participation. These 64 groups were assigned at random to each of the eight combinations of independent variables (leader sex, leadership style, and task order). The leader of each group, though ostensibly selected via a "leadership test," was selected at random according to appropriate sex.

As each group arrived at the (typical) group dynamics laboratory, they were told briefly what to expect during the experiment. Then, the experimenter informed the group that they would have a chance to win a $20 prize in the experiment, with their chances of winning the prize increasing as a function of good group performance on the tasks. The leader was "selected" using the "leadership test."

While the experimenter was "scoring" the test, each group member completed the LPC questionnaire. The experimenter then announced who the leader would be and escorted the leader into another room to receive leadership and task instructions. While the experimenter gave these instructions, the other group members participated in a group discussion of a personal relations problem. During the leader briefing, the experimenter instructed the leader in the use of the appropriate leadership style and explained the rules for the first task.

The leader and experimenter then returned to the group, where the leader was afforded a preparation period in which to get the group ready for the first task. The experimenter observed the group's preparations and their subsequent task performance from an inconspicuous vantage point. After the group had completed the first task, the experimenter again escorted the leader to the private briefing room, and the leader was given the instructions for the second task. The leadership style briefing was not repeated, nor was the leader given any feedback as to how well he/she was enacting the leadership role or how well the group had performed.

Upon returning to the group, the leader once more was allowed time to prepare the group for the task. When the second task was over, the experimenter administered a questionnaire containing various rating scales (Appendix E) designed to assess the group members' reactions to the

leader and the situation. When all members had completed the questionnaire, the experimenter explained the purposes of the research and thanked the group for their participation.

Results of the experiment indicated that the manipulation of leadership style had been effective. Participant ratings of the leader behaviors, as well as independent observations by other persons assigned to count leader behaviors in 16 randomly selected groups, agreed in indicating that structuring leaders were more structuring than considerate leaders and vice versa for considerate behaviors.

Effects of the independent variables on the dependent variables were assessed using MANOVA for the 31 interval measures. The 22 frequency scores were transformed using an angular transformation and these scores were analyzed via ANOVA. All hypotheses were evaluated with an alpha of .05. Since the frequency scores could not be subjected to MANOVA, results on these measures were examined in conjunction with significant multivariate effects for the interval measures. Of course, where specific a priori predictions had been made, treatment effects were evaluated using a per comparison error rate.

The measures of group performance (leader effectiveness) showed an overall effect for leadership style, with the score on the TV task being the only significant univariate effect. Groups with structuring leaders performed better on this task than groups with considerate leaders.

The predictions that male-led groups would be more effective and that there would be an interaction between leader sex and leadership style for the group performance scores were not supported.

On the rating measures, there were significant multivariate effects for leadership style and task order. For structuring leaders, the group atmosphere was rated worse, the leader structure was rated greater, the leader consideration was rated lower, individual group member's performance was rated worse for the first task, leader power was rated higher, and the group members' enjoyment of the experiment was rated lower than for considerate leaders. Univariate task order effects were for the group members' ratings of task dimensions (structure, solution multiplicity), performance (by the individual and the group), and attribution of individual responsibility for group performance.

The predicted overall effects for leader sex and the interaction of leader sex and leadership style were not observed on the rating scores. However, several a priori hypotheses concerning rating scores were supported: (1) Male leaders were rated as more influential than female leaders; (2) male leaders rated the group situation less favorably than female leaders; (3) male leaders were more critical of their groups' performances than female leaders; and (4) female followers rated their leaders more considerate than did male followers.

On the strategy measures, there was only one multivariate effect, the effect of leadership style. Groups with structuring leaders used fewer players on the TV task, more word listers on the word task, and more people to check words in the dictionary when compared to groups with considerate leaders. Analysis of frequency data indicated that structuring leaders, as constrasted to considerate leaders, appointed more group members to specific positions, used fewer female players on the TV task, and appointed more male word listers. Furthermore, groups with structuring leaders were more likely to hide one paddle on the TV game when it was the other paddle's turn to hit (a cooperative gesture which made it easier to tell who should hit the ball) and chose a strategy less frequently on the word task where all group members called words out to a single word lister. When compared across all groups, male players participated significantly more often than female players in skilled positions on the TV task, while the reverse was true for the word task.

Males and females failed to show the predicted difference in leadership orientation, as measured by Fiedler's LPC Scale. Furthermore, leader's LPC score was not a significant predictor of group performance.

The results were interpreted as indicating that leadership style is an important determinant of leader effectiveness, but that the leader's sex and the interaction of leader sex and leadership style, contrary to what one

might expect from research supporting Parsons and Bales (1955) position on appropriate sex-role behaviors, may not be all that important in determining leader effectiveness. Generalization from the present situation to others should be approached with caution, however, since college students in an academic setting may show different responses to female leaders than people in general, and since leadership was observed in a relatively restricted group/task situation. More research is needed to see if the present findings are replicated in other situations and with other populations.

The differences in rating scores appear to support a moderate to weak effect for leader sex, but not for the interaction of leader sex and leadership style. Perhaps the effects of sex-stereotyping are being diminished in the wake of current social movements. We should continue to observe the course of sex stereotypes as more women come to hold responsible positions more frequently in our society.

The strategies used by the groups seemed to be based on logical information processing by the leader and the group members. Leaders chose people for specific positions apparently based on their assessments of the demands of the situation and their leadership style. For example, structuring leaders, who were more concerned with doing well on the task, chose more male TV players than considerate leaders, probably in response to the stereotyped belief that

males would be better than females on this task. Males may, indeed, have been better TV players, based on greater task familiarity.

The findings are interpreted as supporting Fiedler's contingency theory of leadership. Fiedler's high and low LPC leaders were simulated by leadership instructions (considerate versus structuring). In the highly favorable group/task situation for the leader, that is when the group was working on the TV task leadership style was a significant predictor of leader effectiveness, with groups led by structuring leaders performing better. In the moderately favorable situation, we began to see a reversal in which style was more effective, though style was not a significant predictor of success on the word task. These results are generally in agreement with what we would expect based on Fiedler's theory.

Since the present research failed to find the pervasive effects of sex stereotyping reported by other authors and as expected based on Parsons and Bales' (1955) theory, it was suggested that further research be conducted to find out where and when sex stereotypes may be important determinants of leadership effectiveness and group members' impressions.

APPENDIX A

LAB 1 TEST OF LEADERSHIP ABILITY

Please read the following items and indicate your opinion concerning each item. If you agree, or mostly agree with a statement, place an "X" through the letter "A" to the left of the item. If you disagree, or mostly disagree with a statement, place an "X" through the letter "D" to the left of the item. For example:

0. ~~A~~ D Roses are red, violets are blue.

Please respond to every statement with your strongest initial impression. If you have any questions, please consult the experimenter now. You may begin.

1. A D Failure of a group to reach its goals is most often due to ineffective leadership.

2. A D Most leaders are born, not made.

3. A D A good leader should not allow another member of the group to usurp leadership functions.

4. A D Often, groups fail to reach their goals because the group members will not accept a strong leader.

5. A D Jim, who works in a shop with twelve other men, is failing to maintain minimum standards in his job. As Jim's supervisor, Dave should reprimand Jim within sight of the other workers, but beyond their hearing range.

6. A D It is better for a leader to maintain close social relations with his or her followers.

7. A D The leader is ultimately responsible for the actions of the group.

8. A D Alice is the manager of a large department store. She is faced with a decision as to whom to promote to department supervisor. One candidate is outgoing and popular with the other workers, but is somewhat unorganized. The other candidate is quieter and less popular, but is highly efficient. Alice should promote the more efficient candidate.

APPENDIX A (CONTINUED)

9. A D Almost anyone within the group can be a good leader, with the proper training.

10. A D There are no essential differences between "leaders" and "managers" in our society.

11. A D A person can be an effective group leader without being skilled on the task faced by the group.

12. A D Lynn has become concerned because Pat, a new member of the work group which Lynn supervises, has suggested some major revisions to the work plan which Lynn has developed over a long time period. Lynn should continue to use the proven work plan, but explain to Pat why the revisions probably would not work.

APPENDIX B

TELSTAR ALPHA GAME: INSTRUCTIONS

During the experiment, you will be playing two television games using the Telstar Alpha video unit. The object in each of these games will be to keep the electronic "ball" in play as long as possible. Your group will score one point for every two seconds the ball is kept in play. Any strategy you may wish to use may be employed (with the exception of resonance, as described below), but remember your goal is to keep the ball in play. Play will end when either automatic score display on the TV screen reaches 15. The automatic scorers start at 0 and increase by one count each time a paddle fails to hit the ball in proper sequence. Your experimenter will serve as starter and official scorer for each game. If during play a resonance between the two paddles should be established (that is, if the ball goes back and forth indefinitely between the paddles with no need to move the paddles), the experimenter will stop the game and scoring will start over. At no time are you to manipulate any of the controls on the game console other than the two knobs which control the paddles. You will have 15 minutes to prepare for the two games in any way you see fit. You may practice each of the games during this period and plan your strategy. After your 15 minute preparation period, each game will be played in succession for points.

TV Tennis. The first game you will play is TV Tennis. In this game, the ball is served from one side of the screen and must be returned to the other side by a hit with the paddle. Then the paddle on the opposite side must return the ball. Play continues in this alternating sequence until either score display reaches 15. The object is to keep the ball in play as long as possible by hitting it with the paddles as often as possible. One point is scored for each two seconds the ball is in play.

TV Jai-Alai. In this second game, both paddles are located on the same side of the screen. The ball is served off the wall and must be returned by the appropriate paddle. Paddles then alternate hits to keep the ball in play. The paddle which last hit the ball will not affect the flight of the ball until it has been hit by the other paddle. This is true no matter how many times the ball may come off the wall. Play continues until either score display reaches 15. One point is counted for every two seconds the ball is in play. Once again, the object in the game is to keep the ball in play as long as possible.

APPENDIX C

WORD GAME: INSTRUCTIONS

The object of the word game is to make as many legitimate words as possible using letters that are next to each other on the display cubes placed on your table. Every side of the display cube has the same set of letters in the following pattern:

C A T

O R S

M E L

Words are formed by connecting the letters in proper order. Each letter that follows another letter in your word must touch that letter on the display. Letters may be adjacent or touch on the diagonal. For example, with the display above, CAT is an obvious word in which the letters may be found touching each other in the proper order on the cube. MOAT, STAR, SAT, CATS, and REST are also properly formed words. Many other words may be made from this display. Each letter may be used only once in a given word. Thus, STARS would not be a proper word because the "S" is used twice. Letters that do not touch each other in the proper order may not be used. Thus, TRACE would not be a proper word because the "C" and the "E" do not touch each other. Furthermore, you will be penalized for every improper word, so be careful.

In order for a word to be legitimate, it must be a standard English word (no slang, foreign words, abbreviations, acronyms, or proper nouns). The only exception to this rule is for foreign words used commonly in English, such as corpus. The standard for deciding whether a word is acceptable is whether it is found in the dictionary provided. If the word is not in the dictionary, it will not be allowed and will incur a penalty. Even if the word is in the dictionary, it will not be allowed if it is capitalized (proper noun) or is identified as an abbreviation or slang word. Words identified as colloquial are acceptable, however.

APPENDIX C (CONTINUED)

You will have 10 minutes to practice and plan your strategy. During this time, you will be provided a practice display similar to the one you will be using during the actual task. You may use the time to prepare for the task in any way you see fit. After the practice time, the experimenter will present your actual display and you will have 10 minutes to work on the task. At the end of the 10 minutes, the experimenter will ask you for a single list of words. This is the list which will be scored; any words on this list will count either for you or against you. The following system of scoring will be used:

A 2 or 3 letter word scores 1 point (Single letter words do not count.)

A 4 letter word counts 2 points, a 5 letter word 3 points, a 6 letter word 4 points, etc.

Penalties of 3 points each will be invoked for the following infractions:

A misspelled word.

A word which appears more than once on the list.

Any word which is not formed in accordance with the rules.

Any word that does not appear in the dictionary.

APPENDIX D

QUESTIONNAIRE 1

Seat Position _____

People differ in the ways they think about those with whom work. This may be important in working with others. Please give your immediate, first reactions to the following items.

Below are pairs of words which are opposite in meaning, such as "Very neat" and "Not neat". You are asked to describe someone with whom you have worked by placing an "X" in one of the eight spaces on the line between the two words.

Each space represents how well the adjective fits the person you are describing, as if it were written:

Very neat : ___ : ___ : ___ : ___ : ___ : ___ : ___ : ___ : Not neat

8	7	6	5	4	3	2	1
Very neat	Quite neat	Somewhat neat	Slightly neat	Slightly untidy	Somewhat untidy	Quite untidy	Very untidy

FOR EXAMPLE: If you were to describe the person with whom you are able to work least well, and "Quite neat" would be the best description of how you ordinarily think of that person, you would put an "X" in the second space from the words "Very neat" (that is to say, in space number 7), like this:

Very neat : ___ : X : ___ : ___ : ___ : ___ : ___ : ___ : Not neat

8	7	6	5	4	3	2	1

Look at the words at both ends of the line before you put in your "X". Please remember that there are no right or wrong answers. Work rapidly; your first answer is likely to be the best. Please do not omit any items, and mark each item only once.

APPENDIX D (CONTINUED)

Now, I would like you to think of the person with whom you work or worked least well. This person may be someone you work with now, or he may be someone you knew in the past. This person may not be the one you like least well, but should be the person with whom you had the most difficulty in getting a job done. Describe this person as he appears to you.

Pleasant	:	___	___	___	___	___	___	___	: Unpleasant
		8	7	6	5	4	3	2	1
Friendly	:	___	___	___	___	___	___	___	: Unfriendly
		8	7	6	5	4	3	2	1
		8	7	6	5	4	3	2	1
Rejecting	:	___	___	___	___	___	___	___	: Accepting
Helpful	:	___	___	___	___	___	___	___	: Frustrating
Unenthusiastic	:	___	___	___	___	___	___	___	: Enthusiastic
Tense	:	___	___	___	___	___	___	___	: Relaxed
Distant	:	___	___	___	___	___	___	___	: Close
Cold	:	___	___	___	___	___	___	___	: Warm
Cooperative	:	___	___	___	___	___	___	___	: Uncooperative
Supportive	:	___	___	___	___	___	___	___	: Hostile
Boring	:	___	___	___	___	___	___	___	: Interesting
Quarrelsome	:	___	___	___	___	___	___	___	: Harmonious
Self-assured	:	___	___	___	___	___	___	___	: Hesitant
Efficient	:	___	___	___	___	___	___	___	: Inefficient
Gloomy	:	___	___	___	___	___	___	___	: Cheerful
Open	:	___	___	___	___	___	___	___	: Guarded
		8	7	6	5	4	3	2	1

APPENDIX E

QUESTIONNAIRE 2

Below is a series of questions concerning the group you just participated with. Please respond to each question by placing an "X" in the space which best represents your feelings or opinion.

1. How well did your group perform on the first task?

   Very Well :___:___:___:___:___:___:___: Not Very Well

2. How well did your group perform on the second task?

   Very Well :___:___:___:___:___:___:___: Not Very Well

3. How would you rate your own performance on the first task?

   Poor :___:___:___:___:___:___:___: Excellent

4. How would you rate your own performance on the second task?

   Poor :___:___:___:___:___:___:___: Excellent

5. How satisfied were you with the overall performance of your group on the two tasks?

   Very Satisfied:___:___:___:___:___:___:___: Not Very Satisfied

6. How much did you enjoy working with your group on these tasks?

   Did Not Enjoy :___:___:___:___:___:___:___: Enjoyed Very Much

7. Do you think your leader deserved the leadership position?

   Definitely Deserved :___:___:___:___:___:___:___: Did Not Deserve

8. To what extent do you feel the group's performance was due primarily to the performance of the leader?

   Not At All :___:___:___:___:___:___:___: Totally

APPENDIX E (CONTINUED)

9. To what extent do you feel the group's performance was due to your own performance?

Not At All :___:___:___:___:___:___:___: Totally

10. To what extent do you feel the group's performance was due to the performance of the group members other than the leader?

Not At All :___:___:___:___:___:___:___: Totally

11. How important was luck in your group's performance?

Very Important:___:___:___:___:___:___:___: Not Very Important

12. If your group should win the lottery for the prize money, what percentage of the prize money should the leader get? What percentage should you get?

Leader should get ____%. I should get ____%.

On the following items, please place an "X" in the position which best describes the atmosphere of your group.

		8	7	6	5	4	3	2	1	
13.	Friendly	:	:	:	:	:	:	:	:	Unfriendly
14.	Accepting	:	:	:	:	:	:	:	:	Rejecting
15.	Satisfying	:	:	:	:	:	:	:	:	Frustrating
16.	Enthusiastic	:	:	:	:	:	:	:	:	Unenthusiastic
17.	Productive	:	:	:	:	:	:	:	:	Nonproductive
18.	Warm	:	:	:	:	:	:	:	:	Cold
19.	Cooperative	:	:	:	:	:	:	:	:	Uncooperative
20.	Supportive	:	:	:	:	:	:	:	:	Hostile
21.	Interesting	:	:	:	:	:	:	:	:	Boring
22.	Successful	:	:	:	:	:	:	:	:	Unsuccessful
		8	7	6	5	4	3	2	1	

The following items refer to the leader of your group. Use the following key to indicate how frequently the leader exhibited the behaviors listed below while working with your

APPENDIX E (CONTINUED)

group. Simply place the letter prepresenting the correct frequency in front of the statement on the line provided.

A = Always; B = Often; C = Occasionally; D = Seldom;

E = Never.

___23. Refused to explain his or her actions.

___24. Made his or her attitude clear to the group.

___25. Tried out his or her new ideas on the group.

___26. Was friendly and approachable.

___27. Treated all group members as his or her equal.

___28. Maintained definite standards of performance.

___29. Assigned group members to particular tasks.

___30. Found time to listen to group members.

___31. Made sure that his or her part in the group was understood.

___32. Looked out for the personal welfare of the group members.

___33. Was easy to understand.

___34. Acted without consulting the group.

___35. Ruled with an iron hand.

___36. Criticized poor performance.

___37. Saw to it that each group member performed up to capacity.

___38. Was willing to make changes.

___39. Accepted suggestions from the other group members.

___40. Spoke in a manner not to be questioned.

The following questions refer to different aspects of the task situation you have just experienced. Indicate your opinion with an "X" in the appropriate space.

APPENDIX E (CONTINUED)

41. How difficult did you think task 1 was?

Very Difficult :___:___:___:___:___:___:___: Not Very Difficult

42. How difficult did you think task 2 was?

Very Difficult :___:___:___:___:___:___:___: Not Very Difficult

43. How clear to you was the object of task 1?

Not Very Clear :___:___:___:___:___:___:___: Very Clear

44. How clear to you was the object of task 2?

Not Very Clear :___:___:___:___:___:___:___: Very Clear

45. Would you say that task 1 was structured or unstructured?

Structured :___:___:___:___:___:___:___: Unstructured

46. Would you say that task 2 was structured or unstructured?

Structured :___:___:___:___:___:___:___: Unstructured

47. Would you say that there are many or few ways to successfully perform task 1.

Few Ways :___:___:___:___:___:___:___: Many Ways

48. Would you say that there are many or few ways to successfully perform task 2.

Few Ways :___:___:___:___:___:___:___: Many Ways

49. By virtue of holding the leadership position, how much power do you think was given to the leader?

Very Little :___:___:___:___:___:___:___: A Great Deal

APPENDIX F

EXPERIMENTER'S OBSERVATION FORM

Group _____ Code _____ Date _____ Ldr _____

Seating: A _____ B _____ C _____ D _____

Scores: TV. Tennis + Jai-Alai = Time = Points

_____ + _____ = _____ = _____

Word. 1 x (2,3 ltr) + 2 x (4 ltr) + 3 (5 ltr) +
4 (6 ltr) - Penalty (3) = Total

_____ + _____ + _____ + _____ - _____ = _____

Strategies: TV. Practice. (1) _____ _____ (2) _____ _____
(3) _____ _____ (4) _____ _____ (5) _____ _____ (6) _____
_____ How many tennis? _____ How many jai-alai? _____
Lose points? _____ Hide? _____ Together? _____ Real.
(1) _____ _____ (2) _____ _____ Lose points? _____
Hide? _____ Together? _____ Comments _____

_____

_____

Word. Practice. Listers ____ ____ ____ ____ Checkers
____ ____ ____ ____ All Call, One List? ____ All List,
Call to One? ____ All List, One Combine? ____ Ldr Appoint
Lister? ____ Ldr Appoint Checker? ____ Real. Listers _____
_____ Checkers ____ ____ ____ ____ Ldr Appoint Lister(s)?
____ Checkers? ____ All, One List? ____ All, Call to One?
____ All, One Combine? ____ Any system? If so, what? ____

_____

Ldr suggest system? _____ Comments _____

_____

_____

NOTES:

APPENDIX G

OBSERVER'S CODING FORM

	LEADER	GROUP
HOW OFTEN DID THE UNIT:		
(1) Give directions to a specific person, or appoint that person to specific duties? (include "why don't you", etc.)		
(2) Give directions to the group? (on strategy, etc.)		
(3) Make suggestions? (include "why don't we"; "shouldn't we"; etc.)		
(4) Ask for volunteers? ("who would like to ..."; etc.)		
(5) Ask for information?	From leader	From group
(6) Ask for suggestions? ("what do you think we should do?"; etc.)		
(7) Clarify a point?		
(8) Call for consensus?		
(9) Praise performance?		
(10) Criticize Performance?		

OTHER LEADER BEHAVIORS:

STRUCTURING _____ CONSIDERATION _____

APPENDIX H

UNIVERSITY OF FLORIDA

DEPARTMENT OF PSYCHOLOGY CONSENT FORM

Subject's name _____

Subject's address _____

Project number 929 Project title Group Problem Solving

Principal investigator Mickey R. Dansby Date _____.

I agree to participate in the research as explained to me below:

You will be working as four-person groups on several different problems. The problems involve motor and verbal skills, as well as group interaction skills. One person from your group will serve as the leader, while the others will be followers. In addition to your performing the task problems, you will be asked to complete several questionnaires asking your opinions on various aspects of your group's interaction. Care will be taken to maintain confidentiality of your responses to all questionnaires. You will not be identified by name or student number on the questionnaires. The experimenter does not anticipate that you will be subjected to any harmful effects, either physical or psychological, during your participation. On the contrary, you will probably enjoy the experiment. Please be assured that the results of this experiment will be used to further the general scientific knowledge in the area of group dynamics and will not be used for any commercial purpose.

The above stated nature and purpose of this research, including discomforts and risks involved (if any) have been explained to me verbally by M. R. Dansby (or _____). Furthermore, it is agreed that the information gained from this investigation may be used for educational purposes which may include publication. I understand that I may withdraw my consent at any time without prejudice.

Signed _____

I have defined and fully explained this research to the participant whose signature appears above.

Signed _____

code

APPENDIX I

GROUP DISCUSSION TASK

During this experiment you will be solving puzzles as a group. Because we want each of you to feel a member of the group, we're going to give you a chance to get to know each other.

To help you get to know each other, a task has been structured that we believe will give you a chance to become acquainted. You'll be given an interpersonal problem to discuss. Since you'll not be asked for a group solution, just comment on how you feel about the problem presented. After a few minutes have passed, time will be called and you'll begin the actual puzzle-solving.

Please remember that during this preliminary discussion you are not being asked to come to any agreement or to give a group solution. Are there any questions before you begin?

Here is the problem:

Henry, the son of a physician, has a friend, Jim, who is under the care of Henry's father. Henry knows that Jim is incurably ill. Both Henry and Jim are in love with a girl, Ellen. Jim doesn't know what kind of disease he has; neither does Ellen know that he is incurably ill. One night Henry calls on Ellen just after he has decided to give up his studies and accept a job in California. He intends to ask her to marry him and to go with him to California. Henry knows that for many years Ellen has wanted to go to live there. Before he gets a chance to tell her, however, Ellen announces her engagement to Jim.

"What should Henry say and do?"

APPENDIX J

TASK DESCRIPTIONS FOR RATERS

Materials: Each group has paper, pencils, a dictionary, a three by three array of letters, and instructions on how to form legitimate words from the letters.

Instructions: "You are to form as many legitimate words as you can within a 10-minute period using the following array of letters:

R T A
E L M
S O P

In order for the words to be legitimate, they must be standard English words (found in the dictionary provided; no slang, proper nouns, etc.) and must be formed in the following manner: Each letter in a word must touch, either on the side or on a diagonal, the previous letter in the word. That is to say, the letters must touch each other in proper order on the display. You may go forward, backward, or on a diagonal, but you may not jump over other letters in the display. For example, MOP, SLOP, POLE, POLES, and ALTER are legitimate words; MAP and POST are not. You may use each letter only once in a given word, but as many times as possible in different words. You must provide one list of words at the end of the 10 minutes. The longer a word is, the more points it scores. For example, a two-letter word is worth one point, as is a three-letter word; but a four-letter word is worth two points, and a five-letter word is worth three points, and so on, up to a nine-letter word, which is worth seven points. You will be penalized three points for every non-legitimate word which appears on your list and for every word that appears more than once on your list."

Solution: There are at least 70 legitimate English words to be found in the display.

Criteria: Net points scored; total number of words correctly formed.

APPENDIX J (CONTINUED)

Materials: Television set, commercially available electronic television game ("Telstar Alpha" by Coleco).

Instructions: "You are to play two television games as a group. Any number of group members may play the games--everyone does not have to participate. The two games are TV Tennis, in which two electronic paddles hit an electronic ball from side to side on the TV screen, and TV Jai-alai, in which two paddles alternate hitting the ball against a back wall. In both games, each paddle is controlled by an independent paddle controller, thus allowing the paddles to move independently from each other. In both games, each time a paddle fails to hit the ball in its proper sequence a point is scored on the TV screen. When the point score reaches 15, the game is over. Your goal, as a group, is to play the game as long as possible before reaching a score of 15. You will score points as a group as follows: one point for every two seconds the ball is in play, up to a maximum of 10 minutes (300 group points) for each TV game. Remember, you are not competing with each other; rather, you are cooperating with each other to keep the ball in play as long as possible."

Solution: There is a maximum combined score for the two games of 600 points when each game is played for 10 minutes without reaching a displayed score of 15.

Criteria: Number of group points; total time the games are played.

APPENDIX K

TASK RATING QUESTIONNAIRE

INSTRUCTIONS: You have been given descriptions of 10 tasks that have been used in experiments with college students. We are asking you to rate these tasks according to several criteria for the purpose of scaling the tasks. For any case in such tasks where it seems appropriate, you may assume the following:

a. The instructions listed on the description are minmal; it is assumed that they are understood by all group members.
b. The first of the several criteria listed is the one to be used in evaluating the group performance.
c. The size of the group is four or five persons.
d. Group members are selected randomly from a population of college undergraduates.
e. The group is unstructured; that is, no structure is imposed on the group, no leader is assigned, no restrictions are placed on the communications channels, etc., except as specified on the task infcrmation sheet.

First, we would like you to rate the tasks, in the order they are given to you by the experimenter, on the following criteria:

1. Decision verifiability. The degree to which the "correctness" of the solution or decision can be demonstrated, either by appeal to authority (e.g., the 1970 census), by logical procedures (e.g., mathematical demonstration), or by feedback (e.g., examination of consequences of the decision, as in action tasks).

2. Goal clarity. The degree to which the requirements of the task are clearly stated or known to the group members.

3. Goal path multiplicity. The degree to which the task can be solved by a variety of procedures (number of different paths to the goal, number of alternatives for solution, number of different ways that the task can be completed).

4. Population familiarity. The degree to which the task is commonly encountered in the larger society; i.e., the probability that the members will have had prior experience with the class of tasks to which the task belongs.

5. Solution multiplicity. The degree to which there is more than one "correct" solution. (Some tasks, e.g.,

APPENDIX K (CONTINUED)

arithmetic problems, have only one solution that is acceptable; others have two or more, e.g., a sorting task where all items to be sorted have several dimensions; and still others have almost an infinite number of possible solutions, e.g., human relations problems or matters of opinion.)

6. Sex bias. The degree to which males or females would be expected to perform better on the task.

After you have rated each of the ten tasks on these criteria, we would like you to put the ten tasks in rank order based on each of the criteria, with the task exhibiting the highest degree of the dimension on the top of your pile and the task exhibiting the least degree of the dimension on the bottom. Record your ranking in the spaces provided for each dimension.

GOAL PATH MULTIPLICITY

Task A	Low	:___:___:___:___:___:___:___:___:	High
Task B		:___:___:___:___:___:___:___:___:	
Task C		:___:___:___:___:___:___:___:___:	
Task D		:___:___:___:___:___:___:___:___:	
Task E		:___:___:___:___:___:___:___:___:	
Task F		:___:___:___:___:___:___:___:___:	
Task G		:___:___:___:___:___:___:___:___:	
Task H		:___:___:___:___:___:___:___:___:	
Task I		:___:___:___:___:___:___:___:___:	
Task J		:___:___:___:___:___:___:___:___:	

Rank order of tasks: _____

APPENDIX K (CONTINUED)

POPULATION FAMILIARITY

Task A Low :___:___:___:___:___:___:___:___: High

Task B :___:___:___:___:___:___:___:___:

Task C :___:___:___:___:___:___:___:___:

Task D :___:___:___:___:___:___:___:___:

Task E :___:___:___:___:___:___:___:___:

Task F :___:___:___:___:___:___:___:___:

Task G :___:___:___:___:___:___:___:___:

Task H :___:___:___:___:___:___:___:___:

Task I :___:___:___:___:___:___:___:___:

Task J :___:___:___:___:___:___:___:___:

Rank order of tasks: _____

DECISION VERIFIABILITY

Task A Low :___:___:___:___:___:___:___:___: High

Task B :___:___:___:___:___:___:___:___:

Task C :___:___:___:___:___:___:___:___:

Task D :___:___:___:___:___:___:___:___:

Task E :___:___:___:___:___:___:___:___:

Task F :___:___:___:___:___:___:___:___:

Task G :___:___:___:___:___:___:___:___:

Task H :___:___:___:___:___:___:___:___:

Task I :___:___:___:___:___:___:___:___:

Task J :___:___:___:___:___:___:___:___:

Rank order of tasks: _____

APPENDIX K (CONTINUED)

GOAL CLARITY

Task A Low :___:___:___:___:___:___:___:___: High

Task B :___:___:___:___:___:___:___:___:

Task C :___:___:___:___:___:___:___:___:

Task D :___:___:___:___:___:___:___:___:

Task E :___:___:___:___:___:___:___:___:

Task F :___:___:___:___:___:___:___:___:

Task G :___:___:___:___:___:___:___:___:

Task H :___:___:___:___:___:___:___:___:

Task I :___:___:___:___:___:___:___:___:

Task J :___:___:___:___:___:___:___:___:

Rank order of tasks: _____

SOLUTION MULTIPLICITY

Task A Low :___:___:___:___:___:___:___:___: High

Task B :___:___:___:___:___:___:___:___:

Task C :___:___:___:___:___:___:___:___:

Task D :___:___:___:___:___:___:___:___:

Task E :___:___:___:___:___:___:___:___:

Task F :___:___:___:___:___:___:___:___:

Task G :___:___:___:___:___:___:___:___:

Task H :___:___:___:___:___:___:___:___:

Task I :___:___:___:___:___:___:___:___:

Task J :___:___:___:___:___:___:___:___:

Rank order of tasks: _____

APPENDIX K (CONTINUED)

SEX BIAS

	Males Better								Females Better
Task A		:___:	___:	___:	___:	___:	___:	___:	___:	
Task B		:___:	___:	___:	___:	___:	___:	___:	___:	
Task C		:___:	___:	___:	___:	___:	___:	___:	___:	
Task D		:___:	___:	___:	___:	___:	___:	___:	___:	
Task E		:___:	___:	___:	___:	___:	___:	___:	___:	
Task F		:___:	___:	___:	___:	___:	___:	___:	___:	
Task G		:___:	___:	___:	___:	___:	___:	___:	___:	
Task H		:___:	___:	___:	___:	___:	___:	___:	___:	
Task I		:___:	___:	___:	___:	___:	___:	___:	___:	
Task J		:___:	___:	___:	___:	___:	___:	___:	___:	

Rank order of tasks: _____

Males better . . . Females Better

Sex of respondent: male female (circle one)

APPENDIX L

CELL MEANS FOR INTERVAL DEPENDENT MEASURES

Table 6

Cell Means for Interval Dependent Measures

Cell[a]	TV Score	Word Score	LPC	Group Atmosphere	Leader Consideration	Leader Structure	Q1[b]
MAS	210.25	49.00	61.72	68.09	41.75	26.88	3.38
MBS	192.00	45.13	63.63	66.78	39.71	27.00	3.25
MAC	121.88	46.50	63.03	70.81	46.67	26.42	3.66
MBC	137.63	53.75	63.84	70.97	45.50	26.29	2.59
FAS	175.50	49.38	67.31	68.06	41.17	28.21	3.56
FBS	202.00	51.50	65.34	69.50	44.00	27.54	2.69
FAC	159.50	56.50	64.56	69.44	43.79	23.79	3.25
FBC	132.53	53.13	63.91	71.03	45.67	24.33	2.16

[a]Cell designations are M and F for male leader or female leader, A and B for TV task first or word task first, and S and C for structuring leader or considerate leade ; n = 8 per cell.

[b]Q refers to the question number on Questionnaire 2, Appendix E.

Table 6--continued

Cell[a]	Q2[b]	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q41	Q42	Q43
MAS	3.47	3.88	4.30	3.03	5.94	2.42	4.29	4.50	5.06	4.31	4.97	4.84	6.00
MBS	3.44	4.22	4.09	3.16	5.78	2.29	4.21	4.44	4.97	4.84	4.78	4.56	5.91
MAC	3.47	3.97	4.75	3.25	5.84	1.91	3.88	4.28	5.16	5.19	4.83	5.20	6.49
MBC	3.78	4.69	4.13	2.59	6.22	2.13	4.46	4.19	4.88	4.78	5.06	4.34	5.81
FAS	2.81	3.25	3.88	3.03	5.71	2.38	4.33	4.47	5.09	5.03	4.83	4.73	5.80
FBS	3.78	4.06	4.14	2.97	6.22	2.58	3.75	3.72	4.88	4.91	4.53	4.53	6.28
FAC	3.09	4.20	4.13	2.91	6.19	3.13	3.96	4.59	5.25	5.06	4.91	4.44	6.13
FBC	3.72	4.31	4.29	2.56	6.56	2.50	3.33	4.22	5.19	4.78	4.88	4.34	5.71

[a]Cell designations are M and F for male leader or female leader, A and B for TV task first or word task first, and S and C for structuring leader or considerate leader; n = 8 per cell.

[b]Q refers to the question number on Questionnaire 2, Appendix E.

Table 6--continued

Cell[a]	Q44[b]	Q45	Q46	Q47	Q48	Q49	# of TV Players	# Practice Tennis	# Practice Jai-alai
MAS	6.03	3.06	2.91	4.28	5.16	4.41	2.88	3.38	3.38
MBS	6.06	2.84	2.84	5.00	3.13	4.38	2.88	4.00	3.13
MAC	6.45	2.73	2.02	4.34	4.91	3.46	3.75	3.50	3.25
MBC	6.12	2.38	2.88	4.72	3.06	3.69	3.38	3.75	3.38
FAS	6.15	2.94	2.64	3.10	3.79	4.59	2.38	3.63	2.88
FBS	6.28	2.53	2.22	4.56	4.09	4.16	3.13	3.25	2.63
FAC	6.38	2.94	2.31	3.84	4.59	3.69	3.50	3.63	2.88
FBC	5.76	2.16	2.98	4.25	3.77	3.26	3.50	2.88	3.50

[a]Cell designations are M and F for male leader or female leader, A and B for TV task first or word task first, and S and C for structuring leader or considerate leader; n = 8 per cell.

[b]Q refers to the question number on Questionnaire 2, Appendix E.

Table 6--continued

Cell[a]	# Word Penalties	# Word Listers	# Word Checkers
MAS	3.63	2.25	1.50
MBS	2.25	2.88	2.13
MAC	3.63	2.25	1.25
MBC	1.63	1.00	.88
FAS	1.38	2.50	1.00
FBS	2.50	2.13	.88
FAC	1.50	2.13	1.00
FBC	1.88	1.38	.88

[a]Cell designations are M and F for male leader or female leader, A and B for TV task first or word task first, and S and C for structuring leader or considerate leader; n = 8 per cell.

APPENDIX M

TRANSFORMED FREQUENCY DATA

Table 7

Transformed Frequency Data
(Y_T = arcsin $\sqrt{Y}$)

Cell[a,b]	Intentional loss of TV Points?	Hiding One Paddle While Other Hits?	Both Players Hit Ball Together?	Resonance Established?
MAS				
Y	.375	.875	.125	0.0
Y_T	.659	1.209	.361	.178
MBS				
Y	.625	.375	.375	0.0
Y_T	.912	.659	.659	.178
MAC				
Y	.500	.875	.125	0.0
Y_T	.785	1.209	.361	.178
MBC				
Y	.625	1.0	0.0	0.0
Y_T	.912	1.376	.178	.178
FAS				
Y	.375	.750	0.0	.250
Y_T	.659	1.047	.178	.524
FBS				
Y	.375	1.0	0.0	.125
Y_T	.659	1.376	.178	.361
FAC				
Y	.625	1.0	0.0	0.0
Y_T	.912	1.376	.178	.178
FBC				
Y	.625	1.0	0.0	.250
Y_T	.912	1.376	.178	.524

[a] Y_T is the transformed score; Y is the relative frequency of the event, i.e., the number of times it occurred divided by n. When Y = 1, (1 - 1/4n) is substituted for Y before transformation; when Y = 0, (1/4n) is substituted. n = 8 per cell.

[b] Cell designations are M and F for male or female leader, A and B for TV task or word task first, and S and C for structuring or considerate leader.

Table 7--continued

Cell[a,b]	Leader Appoint Listers?	Leader Appoint Checkers?	First TV Players M and F?	First TV Players both M?
MAS				
Y	1.0	.500	.750	0.0
Y_T	1.376	.785	1.047	.178
MBS				
Y	.875	.750	.500	.250
Y_T	1.209	1.047	.785	.524
MAC				
Y	.250	.250	.750	.125
Y_T	.524	.524	1.047	.361
MBC				
Y	.250	0.0	.750	.125
Y_T	.524	.178	1.047	.361
FAS				
Y	1.0	.375	.625	.375
Y_T	1.376	.659	.912	.659
FBS				
Y	1.0	.500	.375	.625
Y_T	1.376	.785	.659	.912
FAC				
Y	.250	.125	.875	0.0
Y_T	.524	.361	1.209	.178
FBC				
Y	.250	0.0	.625	.250
Y_T	.524	.178	.912	.524

[a] Y_T is the transformed score; Y is the relative frequency of the event, i.e., the number of times it occurred divided by n. When Y = 1, (1 - 1/4n) is substituted for Y before transformation; when Y = 0, (1/4n) is substituted. n = 8 per cell.

[b] Cell designations are M and F for male or female leader, A and B for TV task or word task first, and S and C for structuring or considerate leader.

Table 7--continued

Cell[a,b]	First TV Players both F?	All Call Words to a Single Lister?	All List Words and Call to One Lister?	All List Words and One Person Combine Lists?
MAS				
Y	.250	.625	0.0	.375
Y_T	.524	.912	.178	.659
MBS				
Y	.250	.375	.250	.375
Y_T	.524	.659	.524	.659
MAC				
Y	.125	.625	0.0	.375
Y_T	.361	.912	.178	.659
MBC				
Y	.125	1.0	0.0	0.0
Y_T	.361	1.376	.178	.178
FAS				
Y	0.0	.500	.250	.250
Y_T	.178	.785	.524	.524
FBS				
Y	0.0	.500	.250	.250
Y_T	.178	.785	.524	.524
FAC				
Y	.125	.625	.125	.250
Y_T	.361	.912	.361	.524
FBC				
Y	.125	.875	0.0	.125
Y_T	.361	1.209	.178	.361

[a] Y_T is the transformed score; Y is the relative frequency of the event, i.e., the number of times it occurred divided by n. When Y = 1, (1 - 1/4n) is substituted for Y before transformation; when Y = 0, (1/4n) is substituted. n = 8 per cell.

[b] Cell designations are M and F for male or female leader, A and B for TV task or word task first, and S and C for structuring or considerate leader.

Table 7--continued

Cell[a,b]	Systematic Word Derivation?	Prize More to Group?	Prize More to Leader?	Prize More to Self and Leader?
MAS				
Y	.250	.125	0.0	0.0
Y_T	.524	.361	.178	.178
MBS				
Y	0.0	.250	.125	.125
Y_T	.178	.524	.361	.361
MAC				
Y	.125	.125	.125	.125
Y_T	.361	.361	.361	.361
MBC				
Y	.125	.375	.250	0.0
Y_T	.361	.659	.524	.178
FAS				
Y	.125	0.0	.125	.125
Y_T	.361	.178	.361	.361
FBS				
Y	.250	0.0	0.0	0.0
Y_T	.524	.178	.178	.178
FAC				
Y	.250	.125	0.0	0.0
Y_T	.524	.361	.178	.178
FBC				
Y	0.0	.125	.125	.250
Y_T	.178	.361	.361	.524

[a] Y_T is the transformed score; Y is the relative frequency of the event, i.e., the number of times it occurred divided by n. When Y = 1, (1 - 1/4n) is substituted for Y before transformation; when Y = 0, (1/4n) is substituted. n = 8 per cell.

[b] Cell designations are M and F for male or female leader, A and B for TV task or word task first, and S and C for structuring or considerate leader.

Table 7--continued

Cell[a,b]	Proportion of Male TV Players	Proportion of Female TV Players	Proportion of Female Word Checkers	Proportion of Male Word Checkers
MAS				
Y	1.0	.438	.375	.375
Y_T	1.445	.723	.659	.659
MBS				
Y	.938	.500	.438	.563
Y_T	1.318	.785	.723	.848
MAC				
Y	1.0	.875	.188	.438
Y_T	1.445	1.209	.448	.723
MBC				
Y	1.0	.750	.250	.188
Y_T	1.445	1.047	.524	.448
FAS				
Y	.875	.313	.188	.313
Y_T	1.209	.593	.448	.593
FBS				
Y	.938	.625	.250	.188
Y_T	1.318	.912	.524	.448
FAC				
Y	.938	.750	.063	.438
Y_T	1.318	1.047	.253	.723
FBC				
Y	.938	.813	.375	.063
Y_T	1.318	1.123	.659	.253

[a] Y_T is the transformed score; Y is the relative frequency of the event, i.e., the number of times it occurred divided by n. When Y = 1, (1 - 1/4n) is substituted for Y before transformation; when Y = 0, (1/4n) is substituted. n = 16 per cell.

[b] Cell designations are M and F for male or female leader, A and B for TV task or word task first, and S and C for structuring or considerate leader.

Table 7--continued

Cell[a,b]	Proportion of Female Word Listers	Proportion of Male Word Listers
MAS		
Y	.500	.625
Y_T	.785	.912
MBS		
Y	.625	.813
Y_T	.912	1.123
MAC		
Y	.688	.438
Y_T	.978	.723
MBC		
Y	.188	.313
Y_T	.448	.593
FAS		
Y	.750	.500
Y_T	1.047	.785
FBS		
Y	.688	.375
Y_T	.978	.659
FAC		
Y	.688	.375
Y_T	.978	.659
FBC		
Y	.438	.250
Y_T	.723	.524

[a] Y_T is the transformed score; Y is the relative frequency of the event, i.e., the number of times it occurred divided by n. When Y = 1, (1 - 1/4n) is substituted for Y before transformation; when Y = 0, (1/4n) is substituted. n = 16 per cell.

[b] Cell designations are M and F for male or female leader, A and B for TV task or word task first, and S and C for structuring or considerate leader.

APPENDIX N

ANALYSIS OF VARIANCE:
LEADER EFFECTIVENESS SCORES

Table 8

ANOVA's for Leader Effectiveness Scores

	TV Task			Word Task			TV Resonances			Word Errors		
Source	df	MS	F	df	MS	F	df	MS	F	df	MS	F
Leader Sex (S)	1	62.02	<1	1	260.02	1.01	1	.0957	3.06	1	15.02	1.46
Leadership Style (LS)	1	52041.0	8.85	1	221.27	<1	1	.0042	<1	1	1.27	<1
Task Order (O)	1	8.27	<1	1	4.52	<1	1	.0042	<1	1	3.51	<1
S X LS	1	3291.9	<1	1	6.89	<1	1	.0042	<1	1	.02	<1
S X O	1	4.52	<1	1	21.39	<1	1	.0042	<1	1	23.77	2.31
LS X O	1	375.39	<1	1	31.64	<1	1	.0324	1.04	1	1.89	<1
S X LS X O	1	7634.39	1.30	1	276.39	1.08	1	.0324	1.04	1	.02	<1
Error	56	5878.75		56	256.34		inf	.03125		56	10.28	

APPENDIX O

ANALYSIS OF VARIANCE: RATING SCORES

Table 9

ANOVA's for Rating Scores

Source	Group Atmosphere MS	Group Atmosphere F[a]	Leader Consideration MS	Leader Consideration F	Leader Structure MS	Leader Structure F	Least Preferred Coworker (LPC) MS	Least Preferred Coworker (LPC) F
Leader Sex (S)	1.89	<1	1.00	<1	7.32	<1	79.32	1.52
Leadership Style (LS)	96.29	5.17	225.00	22.03	77.33	7.90	7.06	<1
Task Order (O)	3.52	<1	2.23	<1	.02	<1	.009	<1
S X LS	16.00	<1	41.18	4.03	41.68	4.26	32.70	<1
S X O	17.54	<1	62.65	6.14	.02	<1	28.56	<1
LS X O	2.64	<1	.008	<1	.93	<1	.05	<1
S X LS X O	1.72	<1	3.36	<1	2.14	<1	5.79	<1
Error	18.64		10.21		9.79		52.27	

[a] *df* for all *F* ratios = (1, 56).

Table 9--continued

Source	Q1[b] MS	Q1[b] F[a]	Q2 MS	Q2 F	Q3 MS	Q3 F	Q4 MS	Q4 F	Q5 MS	Q5 F
Leader Sex (S)	1.49	1.84	.56	<1	.86	1.56	.71	1.29	.32	<1
Leadership Style (LS)	1.49	1.84	.31	<1	3.10	5.61	.78	1.42	.77	1.23
Task Order (O)	9.96	12.35	3.52	2.53	3.96	7.17	.17	<1	.88	1.42
S X LS	.22	<1	.02	<1	.40	<1	.005	<1	.04	<1
S X O	.61	<1	1.72	1.24	.02	<1	1.59	2.88	.02	<1
LS X O	1.33	1.66	0.00	<1	.10	<1	.26	<1	1.13	1.82
S X LS X O	.52	<1	.47	<1	1.15	2.08	.10	<1	.25	<1
Error	.806		1.39		.553		.552		.620	

[a] *df* for all *F* ratios = (1, 56).

[b] Q refers to the questions on Questionnaire 2, Appendix E.

Table 9--continued

Source	Q6[b] MS	Q6[b] F[a]	Q7 MS	Q7 F	Q8 MS	Q8 F	Q9 MS	Q9 F	Q10 MS	Q10 F
Leader Sex (S)	.80	2.36	3.37	3.45	2.12	2.87	.17	<1	.12	<1
Leadership Style (LS)	1.36	4.00	0.00	<1	.91	1.23	.02	<1	.22	<1
Task Order (O)	1.22	3.59	.11	<1	.50	<1	1.64	6.22	.43	1.64
S X LS	.23	<1	1.78	1.82	.39	<1	1.20	4.53	.22	<1
S X O	.44	1.31	.25	<1	2.92	3.95	.94	3.56	.009	<1
LS X O	.16	<1	.25	<1	.39	<1	.12	<1	.001	<1
S X LS X O	.44	1.31	1.37	1.41	.50	<1	.16	<1	.12	<1
Error	.340		.977		.741		.264		.263	

[a] *df* for all *F* ratios = (1, 56).

[b] Q refers to the questions on Questionnaire 2, Appendix E.

Table 9--continued

Source	Q11[b] MS	Q11[b] F[a]	Q41 MS	Q41 F	Q42 MS	Q42 F	Q43 MS	Q43 F	Q44 MS	Q44 F
Leader Sex (S)	.43	<1	.24	<1	.82	1.13	.08	<1	.01	<1
Leadership Style (LS)	.52	<1	.33	<1	.12	<1	.02	<1	.03	<1
Task Order (O)	.08	<1	.08	<1	2.03	2.79	.50	<1	.59	<1
S X LS	.82	1.06	.08	<1	.38	<1	.42	<1	.59	<1
S X O	.28	<1	.13	<1	.72	<1	.70	1.30	.04	<1
LS X O	1.20	1.54	.49	<1	.22	<1	2.19	4.07	1.22	1.98
S X LS X O	.61	<1	.02	<1	.46	<1	.10	<1	.16	<1
Error	.778		.711		.728		.537		.616	

[a] *df* for all *F* ratios = (1,56).

[b] Q refers to the questions on Questionnaire 2, Appendix E.

Table 9--continued

Source	Q45[b] MS	Q45[b] F[a]	Q46 MS	Q46 F	Q47 MS	Q47 F	Q48 MS	Q48 F	Q49 MS	Q49 F
Leader Sex (S)	.20	<1	.26	<1	6.68	5.50	0.00	<1	.05	<1
Leadership Style (LS)	1.39	2.82	.17	<1	.04	<1	.03	<1	11.82	16.71
Task Order (O)	3.10	6.30	1.06	1.71	8.75	7.21	19.32	15.82	.45	<1
S X LS	.18	<1	1.64	2.64	.42	<1	.63	<1	.03	<1
S X O	.38	<1	.23	<1	.59	<1	11.26	9.22	1.13	1.60
LS X O	.26	<1	3.96	6.37	1.95	1.61	.88	<1	.07	<1
S X LS X O	.06	<1	.03	<1	.50	<1	1.72	1.41	.06	<1
Error	.492		.621		1.21		1.22		.707	

[a] *df* for all *F* ratios = (1, 56).

[b] Q refers to the questions on Questionnaire 2, Appendix E.

Table 9--continued

Source	Proportion Awarding More Prize to Group MS	F[a]	Proportion Awarding More Prize to Leader MS	F	Proportion Awarding More Prize to Self and Leader MS	F
Leader Sex (S)	.085	2.72	.015	<1	.003	<1
Leadership Style (LS)	.031	1.00	.015	<1	.003	<1
Task Order (O)	.027	<1	.015	<1	.003	<1
S X LS	.007	<1	.015	<1	.003	<1
S X O	.026	<1	.015	<1	.003	<1
LS X O	.002	<1	.015	<1	.003	<1
S X LS X O	.002	<1	.018	<1	.100	3.20
Error	.03125		.03125		.03125	

[a]*df* for all *F* ratios = (1, inf).

APPENDIX P

ANALYSIS OF VARIANCE: STRATEGY SCORES

Table 10

ANOVA's for Strategy Scores

Source	Intentional Loss of TV Points MS	F[a]	Hide One Paddle While Other Hits MS	F	Both Players Hit Ball Together MS	F	Resonance Established MS	F
Leader Sex (S)	.002	<1	.07	2.09	.09	2.87	.10	3.06
Leadership Style (LS)	.05	1.60	.14	4.38	.03	<1	.004	<1
Task Order (O)	.02	<1	.00	<1	.001	<1	.004	<1
S X LS	.02	<1	.02	<1	.03	<1	.004	<1
S X O	.02	<1	.06	2.03	.002	<1	.004	<1
LS X O	.002	<1	.02	<1	.03	<1	.03	1.03
S X LS X O	.002	<1	.14	4.38	.03	<1	.03	1.03
Error	.03125		.03125		.03125		.03125	

[a] *df* for all *F* ratios = (1, inf).

Table 10--continued

Source	Leader Appoint Word Listers MS	Leader Appoint Word Listers F[a]	Leader Appoint Word Checkers MS	Leader Appoint Word Checkers F	First TV Players Male and Female MS	First TV Players Male and Female F	First TV Players Both Male MS	First TV Players Both Male F
Leader Sex (S)	.003	<1	.04	1.21	.007	<1	.09	2.88
Leadership Style (LS)	1.31	42.02	.52	16.56	.08	2.64	.09	2.88
Task Order (O)	.003	<1	.002	<1	.08	2.64	.11	3.57
S X LS	.003	<1	.006	<1	.01	<1	.10	3.16
S X O	.003	<1	.00	<1	.01	<1	.008	<1
LS X O	.003	<1	.11	3.36	.006	<1	.008	<1
S X LS X O	.003	<1	.01	<1	.01	<1	.02	<1
Error	.03125		.03125		.03125		.03125	

[a] *df* for all *F* ratios = (1, inf).

Table 10--continued

Source	First TV Players Both Female		All Call Words to Single Lister		All List Words and Call to One Person		All List Words and One Combine Lists	
	MS	F[a]	MS	F	MS	F	MS	F
Leader Sex (S)	.06	1.92	.004	<1	.03	1.12	.006	<1
Leadership Style (LS)	.00	<1	.20	6.43	.09	2.92	.05	1.66
Task Order (O)	.00	<1	.03	1.03	.003	<1	.05	1.66
S X LS	.06	1.92	.003	<1	.003	<1	.01	<1
S X O	.00	<1	.00	<1	.03	1.12	.01	<1
LS X O	.00	<1	.13	4.11	.03	1.12	.05	1.66
S X LS X O	.00	<1	.02	<1	.003	<1	.01	<1
Error	.03125		.03125		.03125		.03125	

[a] *df* for all *F* ratios = (1, inf).

Table 10--continued

Source	System for Deriving Words		Proportion of Male TV Players		Proportion of Female TV Players		Proportion of Female Word Checkers	
	MS	F[a]	MS	F	MS	F	MS	F
Leader Sex (S)	.003	<1	.03	1.92	.00	<1	.03	1.77
Leadership Style (LS)	.003	<1	.007	<1	.25	15.97	.03	1.77
Task Order (O)	.03	1.12	.00	<1	.01	<1	.05	3.09
S X LS	.005	<1	.00	<1	.00	<1	.015	<1
S X O	.003	<1	.007	<1	.03	1.96	.015	<1
LS X O	.003	<1	.00	<1	.03	1.75	.015	<1
S X LS X O	.09	2.92	.00	<1	.00	<1	.013	<1
Error	.03125		.01563		.01563		.01563	

[a] *df* for all *F* ratios = (1, inf).

Table 10--continued

Source	Proportion of Male Word Checkers		Proportion of Female Word Listers		Proportion of Male Word Listers	
	MS	F[a]	MS	F	MS	F
Leader Sex (S)	.05	3.49	.05	2.91	.07	4.19
Leadership Style (LS)	.02	1.29	.04	2.83	.12	7.68
Task Order (O)	.06	3.93	.07	4.23	.004	<1
S X LS	.009	<1	.001	<1	.03	1.68
S X O	.03	2.24	.00	<1	.01	<1
LS X O	.08	4.98	.09	5.68	.01	<1
S X LS X O	.002	<1	.03	1.78	.01	<1
Error	.01563		.01563		.01563	

[a]*df* for all *F* ratios = (1, inf).

APPENDIX Q

ANALYSIS OF VARIANCE:
TASK POSITION SEX DIFFERENCE SCORES

Table 11

ANOVA's for Task Position Sex Difference Scores

	TV Player's		Word Checkers		Word Listers	
Source	MS	F[a]	MS	F	MS	F
Leader Sex (S)	.140	<1	.563	<1	5.063	10.31
Leadership Style (LS)	5.641	9.46	.063	<1	.250	<1
Task Order (O)	.391	<1	1.563	1.94	.563	1.15
S X LS	.016	<1	.562	<1	.563	1.15
S X O	.391	<1	1.563	1.94	.250	<1
LS X O	.766	1.28	3.063	3.81	1.563	3.18
S X LS X O	.016	<1	.063	<1	.250	<1
Error	.596		.804		.491	

[a] *df* for all *f* ratios = (1, 56).

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BIOGRAPHICAL SKETCH

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Mr. Dansby graduated with honors from the University of Florida, where he majored in psychology. He earned the degree Master of Science from the same institution in December, 1969. His thesis explored operant conditioning in maintaining behavior chains with intracranial electrical stimulation as primary reinforcement.

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In April, 1979, Captain Dansby will return to the Air Force Academy, where he will assume the position of Assistant Professor of Behavioral Sciences.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Marvin E. Shaw, Chairman
Professor of Psychology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Barry R. Schlenker
Associate Professor
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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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