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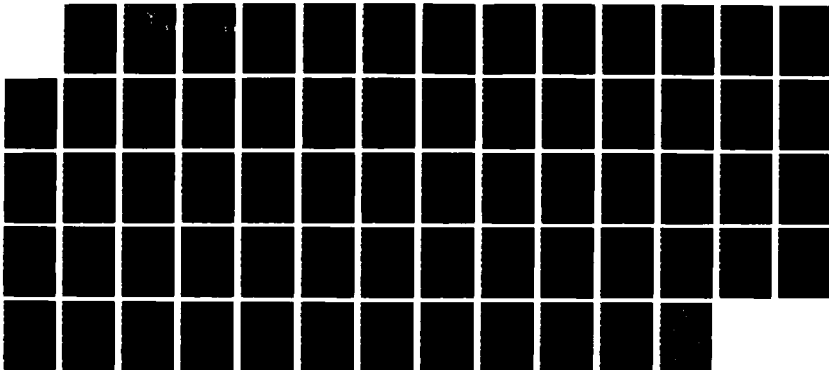
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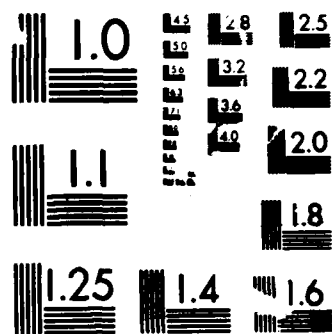
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META-ANALYSIS OF LEADERSHIP DIFFERENCES

BETWEEN MALES AND FEMALES

AND THE EFFECT ON PERFORMANCE

THESIS

Jane Ann Farrell
First Lieutenant, USAF

AFIT/GLM/LSR/87S-24

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Wright-Patterson Air Force Base, Ohio

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META-ANALYSIS OF LEADERSHIP DIFFERENCES
BETWEEN MALES AND FEMALES
AND THE EFFECT ON PERFORMANCE

THESIS

Presented to the Faculty of the School of Systems and Logistics
of the Air Force Institute of Technology
Air University
In Partial Fulfillment of the
Requirements for the Degree of
Master of Science in Logistics Management

Jane Ann Farrell, B.S.
First Lieutenant, USAF

September 1987

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Preface

The purpose of this thesis was to systematically examine the literature available on the issue of male/female leadership differences and the effects on performance. This issue is important to the Air Force and the business world in general as more and more women join the work force.

A process called meta-analysis was used to combine effect sizes across studies regardless of sample size. Meta-analysis provides a systematic, quantitative method for combining information across many studies.

In performing the meta-analysis and writing this thesis, I had a great deal of help from others. I am deeply indebted to my thesis advisor Lt Col John Ballard. His patience and understanding were invaluable as we both endeavored to learn as much as possible about the relatively new procedure of meta-analysis. I would also like to thank Dr. Robert Steel; without his knowledge of meta-analysis this thesis would not have been possible.

Finally, I wish to thank my parents Mr. and Mrs. Paul N. Farrell whose support and encouragement gave me the push I needed to see this project to completion.

Jane Ann Farrell

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Abstract

The purpose of this study was to summarize the effects of women leaders on organizational performance. This thesis examined those studies which have dealt with leadership differences in male and female managers/leaders and the effects of these differences on performance. The statistics reported in each study were systematically converted to a common measure known as effect size. The results of all studies were then combined in a procedure known as meta-analysis. Meta-analysis is systematic and replicable and therefore can lead to conclusions that are more generalizable than traditional review methods.

The issue of women leader's effects on performance is important because the number of women in the United States military has grown in the past four decades from two percent to over eleven percent. Over the next five years the Air Force is expected to increase its percentage of women to 20 percent of the total force.

The results indicated no significant difference in performance of an organization whether led by a male or a female. Any differences that did occur could be attributed to other factors besides sex of the leader.

META-ANALYSIS OF LEADERSHIP DIFFERENCES
BETWEEN MALES AND FEMALES
AND THE EFFECT ON PERFORMANCE

I. Introduction

General Issue

The number of women in the United States military has grown in the past four decades from 2 percent to over 11 percent of the total force. In 1972, the Secretary of Defense directed all branches of the military to double the number of female accessions by 1978. As a result, the Air Force Chief of Staff approved a plan to triple the number of non-rated, non-medical female accessions. In just a twelve year period (1972-1984), the number of Air Force women grew from 16,491 to 66,569 (USAF Special Study Team, 1985).

Congress has directed much of its attention on women in the military toward the Air Force. According to United States Representative Les Aspin, "Pressure to attract women is directed toward the Air Force because women are available for a larger share of Air Force jobs than the other branches of the service" (Aspin, 1984). More specifically, with the passage of the 1985 Department of Defense Authorization Act, the Air Force was directed to ensure that not less than 19 percent of all those enlisting during fiscal year 1987 and 22% of all those enlisting during fiscal year 1988 shall be women (U.S. Congress, 1985).

Over the next five years the Air Force is expected to increase its percentage of women to 20 percent of the total force. This increase will change the male/female composition of the Air Force. Furthermore, the average female's rank in the Air Force is lower than the average male's rank in both enlisted and officer grades. This is because most of the women currently in the force have only entered in the last few years. Over 95 percent of women in the Air Force have ten years of service or less (Gibbons, 1986). As these women move up through the force structure, they will naturally assume positions of increased responsibility and higher rank.

Specific Problem

In both public and private sectors, women are new to leadership roles. Changes in cultural norms and increased legislation banning sex discrimination in the work place have greatly influenced the growing number of women managers (Powell, 1982). The effect of women in leadership roles has not been closely examined to determine the impact on performance of organizations. The effects on performance as a result of women holding leadership roles, especially in traditionally male organizations is of vital importance to the Air Force. Leaders can have a direct impact on morale, productivity, and cohesion. With more women moving into positions of Air Force leadership, an assessment of the impact of the women leader on organizational performance is appropriate for study.

Research Question

Using meta-analysis, the following research question will be addressed: In general, is there a difference in performance between groups which have women as leaders and groups which have men as leaders? If so, what is the magnitude of the sex of the leader -- group performance relationship as aggregated across the empirical studies contained in the literature. No meta-analysis of this relationship currently exists.

Approach to Problem

No general summaries of the effects of women leaders on organizational performance are available. During the past 15 years a body of empirical research has emerged and a few qualitative reviews have been conducted. Overall, however, a systematic review of this literature is not available. This thesis will examine those studies which have dealt with leadership differences in male and female managers/leaders and the effects of these differences on performance. A body of studies will be examined and the results determined by meta-analysis.

The Importance of Meta-analysis. Meta-analysis can be defined as a procedure for examining qualitative data quantitatively (Hattie & Hansford, 1984). This is in contrast to the traditional method of literature review. In the traditional method, the researcher identifies a body of literature and then reports on the subject often introducing bias. There is no system upon which to draw

conclusions and no consideration is given to differing sizes of the populations in the studies. Meta-analysis seeks to provide a systematic method to examine effect sizes across a body of studies.

Advantages of Meta-analysis. Meta-analysis is systematic and replicable and therefore can lead to more generalized conclusions than traditional review methods. It provides clarification of a diverse research area and more information than the single studies taken by themselves. It also highlights limitations of existing literature and can determine variability to be controlled in future studies. Thus it can be determined if there are important findings that occur/emerge across the body of studies. Meta-analysis can also bring out gaps in a research area thus indicating where more research needs to be done (Hattie & Hansford, 1984).

Disadvantages of Meta-analysis. It can be difficult to locate a topic that meets the criteria for a meta-analysis. A topic should be unique, no meta-analysis should exist on that subject. The topic should be suitable for a meta-analysis, there should be a degree of uncertainty or variability in reported results of the studies (Hattie & Hansford, 1984).

Searching for the literature can be another obstacle to a thorough meta-analysis. An inadequate search can bias the results of the meta-analysis. Even a thorough search

may not turn up all the sources. Unpublished works or hard to obtain dissertations may further decrease the accuracy of the meta-analysis (Hattie & Hansford, 1984).

Another problem with the use of meta-analysis is the question of what variables to code. Some variables may not be available in some studies. Even if the variables are present, differences in terminology may inhibit their use. Along with terminology are the varying instruments for measure used in the literature (Hattie & Hansford, 1984).

Some of the studies themselves may not be reliable. The measures used may be inaccurate. Important questions may not have been asked (Hattie & Hansford, 1984).

A common metric must be used to measure effect sizes across the body of studies. Problems arise in choosing this metric. Care must be taken so that statistics are simplified and not made more complicated (Hattie & Hansford, 1984).

II. Literature Review

The Emergence of The Woman Leader

More and more women are entering the American workplace. Keown and Keown (1982) reported that 40% of the work force in 1982 were women. This growth is expected to continue. In 1990 over 57% of those entering the workforce are expected to be women. It is predicted that by 1990 one half of the work force will consist of women (Keown & Keown, 1982).

Several factors have influenced the influx of women into the labor market. Legislation, the feminist movement and the adoption of anti-sex discrimination policies have paved the way for women to enter markets formerly dominated by men. Although women may have equal opportunities to enter the labor market, that will not ensure that women are represented in that market (Cohen, Bunker, Burten, & McManus, 1978). Those individuals entering non-traditional roles may find barriers in their capabilities to influence policy. As more and more women join these non-traditional organizations, their problems may decrease but their ability to be effective may not increase as quickly (Craig & Sheriff, 1986).

As women have entered traditionally male organizations, they have begun to assume management and leadership positions as well. In the mid-seventies an eight percent increase in the number of male managers was overshadowed by a 22 percent increase in the number of female managers

(Larwood & Powell,1981). From 1970 to 1979 the proportion of women managers grew from 15.9 percent to 24.6 percent (Graves & Powell,1982). Legislation and social reform have opened doors for women to acquire leadership positions. (Bartol,1974). Anti-sex discrimination policies have ensured greater participation by women in leadership (Brown, 1979).

Even with the impetus for acceptance, women have encountered barriers to moving into highly responsible management positions (Dubno,1985). The stereotypes of the father as the task specialist or bread winner and the mother as the supporter are still widely held (Hollander & Yoder,1980). In assessing women's roles in government, Cook, Hall and Weir (1985) wrote, "women may lack the experience, contacts and confidence that would enable them to participate as effectively as men" (Cook et al.,1985). There are other barriers to women's total involvement in management, such as the lack of access to vital informal sources of information. Often important information changes hands during social encounters of which women may not be a part (Bass,1981).

An increased number of women in managerial and leadership roles is expected to decrease sex-role stereotyping but this may take time (Ezell, Odewahn, & Sherman,1982). The United States Military Academy admitted their first group of 119 women into the Corps of Cadets as late as 1976 (Adams, Prince, Priest, & Rice,1980). These

cadets graduated in 1980 and a study was done on the new officers by Yoder and Adams (1982). The results of the study indicated that the work atmosphere for the women was less favorable than that for men. Much was blamed on the inability of upper level military men to adjust to the differences of female officers (Yoder & Adams, 1982). As women move into leadership roles, they must continue to prove themselves. Larwood and Lockheed (1979) wrote "The movement of women into non-traditional roles can be reliably sustained only by the success of women already in them" (Larwood & Lockheed, 1979).

Women and Leadership Research

The vast body of leadership research has only been concerned with men as leaders. Even when leadership research was conducted with women as leaders, few comparisons were made between male and female leaders (Hollander & Yoder, 1980). Research concerning sex of the leader is a recent development, primarily a development of the 1970's (Rice, Bender, & Vitters, 1980). Leadership researchers agree that more research is needed on the effect of women in leadership roles at all levels (Bartol, 1974; Rice et al., 1982). Some of the relevant studies pertaining to issues associated with male versus female leaders are summarized here and grouped by topic issue.

Subordinate Attitudes Toward and Satisfaction with Female Leaders. Satisfaction with the leader can influence how much subordinates are willing to put into achieving

organizational goals (Kushell & Newton, 1986). Some research contends that subordinates reaction to females depends on what position they hold. For example, Cohen et al. (1978) found that for females the more contrary to tradition was the supervisory position, the more likely was a poor reaction to supervision. Kanter (1965) (cited in Staley, 1984) surveyed 900 female and 1000 male executives, more than two-thirds of the men and one-fifth of the women reported that they would have difficulty working for a woman.

Some of the research indicated that sex of the leader did not influence subordinate's reactions. Kushell and Newton (1986) wrote that leadership style and not sex of the leader influenced subordinate satisfaction.

The Female Leader's Self-Perception. In much of the literature on self-perception, women did not perceive themselves as poor leaders. Not much of a difference has been indicated in the way males and females look at their own leadership behavior (Bartol & Wortman, 1976). Women even feel they are better leaders than men in some cases. Ezell, et al. (1982) reported that although women managers considered themselves more managerially competent than men, they were rated lower by others. Women reported themselves as being participative leaders where men did not describe themselves as participative (Jago & Vroom, 1982).

Female Leadership Styles and Evaluations. The research in this area addressed the options for women in applying

leadership or management style. Women preferred to use group decision making processes and used one-on-one approaches less frequently (Jago & Vroom, 1982).

Jago and Vroom found that women were more likely to use accepted decision-making models but were continually rated lower than men by peers. Training women to adopt male management techniques may not provide the answer. It is not expected that women using the same power strategies as men would reduce unequal evaluations (Wiley & Eskilson, 1982). Some research suggested a situational leadership style may be more appropriate for women. Women may have to adopt a chameleon-like style, varying their approach according to level in the organization and environment (Izraeli & Izraeli, 1985).

Research indicated that other factors besides style can affected evaluation. Bartol and Butterfield (1976) indicated that different standards were used to evaluate men and women. Male and female managers using the same styles were rated differently according to the performance of their group (Butterfield & Powell, 1981). Brown and Geis (1984) found that perception of an existing consensus could remove bias in the evaluation of females. If the leader was perceived to be backed by superiors and subordinates, their behavior was evaluated favorably both for men and women.

Attitudes and Stereotypes. Both men and women in middle management expressed the feeling that a woman must be better than the average man to progress (Wood, 1975). Much

of the problem lies in the attitudes caused by stereotypes that society holds about traditional roles for men and women. In a longitudinal study conducted by Dubno (1985), a scale was developed to measure attitudes toward women executives. The scale was used at three universities to measure MBA students' attitudes. The findings indicated that male MBA students had more negative attitudes toward women managers than the female students did. The study spanned eight years (1975-1983) and showed no trend toward change in these attitudes. The research suggested that males with negative attitudes toward women manifested these attitudes in the work place (Dubno, 1985).

Women who are successful in non-traditional roles faced conflict and obstacles because of their choice. By not conforming to expected sex-roles, women elicited disapproval. Most organizations would not ostensibly prevent women from achieving success; the legal consequences would be too great. However, the obstacles that prevented women from rising were often so substantial that it was as if the organization had placed them (Larwood, Wood, & Inderlied, 1978). These constraints or barriers to a woman's success were often quite subtle. Geiss, Boston & Hoffman (1985) pointed out that women often lacked access to informal communication networks. Brass (1985) found that informal interaction patterns were an important consideration in measuring influence and promotions. Women tended to interact with women socially and men interacted

with men for the most part. Access to the high-level male interaction network was significantly related to promotions in both sexes. A woman's level of influence was based on her access to this network. Women were less central to the male networks and received proportionately fewer promotions than men (Brass, 1985).

Stereotypes and the associated expectations affected women assuming leadership roles. In a study conducted by Fleischer and Chertkoff (1986), dyads consisting of mixes between high- and low-dominant men and women were observed to determine who emerged as leader. Dyads consisting of a high-dominant woman and a low-dominant man (both contrary to expected roles), the woman was dissatisfied as the follower. If the woman did not become the leader in this case, it was because the man wanted to and not because she did not. However if an outside party pointed out that the woman was more competent, then the low-dominant man was more willing to let the woman be the leader (Fleischer & Chertkoff, 1986). Craig and Sheriff indicated that if women are the minority in a group, they may or may not have equal say, depending upon how important the issue is for the men.

Perceptions based on stereotypes distort reality. Jacobson and Effertz (1974) remarked, "Differences in performance between men and women will more likely be a matter of perception than a matter of fact." Wood and

Karten (1986) contend that sex differences in behavior may be a result of the perceived link between sex and status in the organization.

Implications

Sex is the most striking and easily remembered characteristic of a person. Whether or not it is important to make a distinction, people will note a person's sex (Rice, Bender, & Vitters, 1980). The stereotypes associated with sex may bias the observer. Women may not be perceived as leaders even though they are in leadership positions and act as leaders. In order to rise in an organization, a woman needs to be viewed as a leader. The research clearly indicates that two factors affecting reactions to leadership are sex of the leader and performance of the group (Butterfield & Powell, 1981).

The Leader Sex -- Group Performance Relationship. A number of studies have reportedly been done on the subject of sex of the leader and group performance. For example Hollander and Yoder (1980) listed two studies dealing with the performance or effectiveness of the group as compared to the sex of the leader: Eagly (1970) and Bullard and Cook (1975).

Eagly (1970) conducted an experiment using 67 groups of five each. Group members reviewed a case study and each group developed a solution to the problem posed in the study. The solutions were evaluated and used as the measure of group effectiveness. The next step was to examine the

leadership style of the best liked member and the task leader as measured by Fiedler's Least Preferred Co-worker (LPC) score and determine if there were any significant correlations between leadership style and performance. The results indicated that the LPC score of the task leader did not affect performance (Eagly, 1970).

Bullard and Cook (1975) examined the performance of task groups of 5 where one person (male or female) was assigned as leader. Evidence did not indicate that sex of the leader was a factor in determining performance. Even if the followers were the same sex as the leader, the group was not significantly different in production (Bullard & Cook, 1975).

Similar findings were demonstrated in a study performed on cadets at West Point. Adams et al. (1980) examined male and female cadets to determine if sex of the leader had an impact on performance of the group. The findings indicated that sex alone did not impact performance. Rather a combination of two factors affected performance: leaders sex and follower sex-role attitudes (i.e., feelings toward women as managers) (Adams et al., 1980).

Brown (1979) listed several studies that have compared performance of the group with sex of the leader: Eskilson & Wiley, 1976; Jacobson & Effertz, 1974; Day & Stogdill, 1972. These results of these studies were conflicting; some showed a difference between male and female leaders and some did not.

Bass (1981) indicated that most of the studies on group performance and sex of the leader have been done in laboratory settings. The studies cited by Bass include: Bartol, 1978; Larwood et al., 1978; Bullard & Cook, 1975; Eskilson & Wiley, 1976; Roussel, 1974; Hansen, 1974; Yerby, 1975; Rice et al., 1980. The results reported are not consistent across the studies. Eskilson and Wiley (1976) demonstrated that groups led by women were more productive. Several other researchers indicated that women in leadership roles negatively effected performance (Bass, 1981).

The qualitative nature of the existing literature makes it difficult to draw conclusions. Many of the studies that have measured performance of the group and related it to sex of the leader used different measures of performance. Some measures include: group satisfaction, leader effectiveness, supervisor rating. In many instances the measures may be the same, but due to differing terminology are difficult to compare. Other variables affecting group performance are present in several of the studies; for example some studies also consider the sex-composition of the group, others do not. Reviews in the area have been qualitative. This is especially ineffective when the studies compared vary greatly in sample size.

There exists considerable benefit both to the Air Force and to the field of leadership research to be achieved by a quantitative analysis in this area. Several methods exist for analyzing a data base of studies. The method called

meta-analysis lends itself to this area of leadership research. Meta-analysis enables the combining of studies regardless of sample size. A procedure for coding the extraneous variables allows a researcher to combine the results of studies regardless of the difference in these extraneous factors. Researchers indicate a need for more research comparing men and women as leaders. A meta-analysis of 'group performance and sex of the leader' is a way of determining in a quantitative manner whether or not the empirical studies germane to this topic support or fail to support any real differences in group performance as a function of leader's sex.

III. Method

Sample of Studies

Initially, it was expected that a body of 20 to 30 studies would exist in the area of comparing performance of the group under male and female leaders. Studies comparing male and female leaders in different ways numbered over 80. Each study was examined to determine whether or not it met the criteria for inclusion in the meta-analysis. When those studies that did not meet the requirements were eliminated, there were only 14 studies that could be considered for use in the meta-analysis. Further examination of these studies showed that although a performance measure had been used, the data was not always reported and then the number of useful studies dropped to seven. The seven studies used in the meta-analysis are listed in Appendix A. Appendix B contains a list of 73 studies that were investigated but did not meet the criteria for inclusion in the meta-analysis. The procedures used to gather the literature, information and studies in the area of male and female leadership comparisons are outlined below.

Computerized Data Collection. Computer-based searches were conducted on the following data bases: Defense Technical Information Center (DTIC); PsycINFO (1967-Feb 1987); and Sociological Abstracts (1963-1986). The details of the search on each data base are explained in the following paragraphs.

The first search was conducted on DTIC. The key words used in the search were: women in the Air Force; women/management; and women in the military. Although no studies were obtained for use in the meta-analysis, much of the information was used in chapter I and II of this research effort.

A second search was conducted on the PsycINFO data base. The key words used in this search were: leadership or leadership style; human sex differences or human female; performance, group performance or job performance. Eighteen articles and/or studies including several doctoral dissertations were obtained which contained information in all three key areas combined.

A third search was of Sociological Abstracts. The key words used were: leadership and sex differences. This yielded only six studies, so a fourth search was initiated using: woman/female and leader. Dissertations were excluded on this search because of the huge volume of references obtained. Eliminating the dissertations reduced the listing to forty articles and studies on the key subjects.

A final search was conducted on Sociological Abstracts using numerical codes representing: females; human sexual differences; and leader. This search yielded a list of 73 published studies or articles. The most recent 30 articles were listed.

Manual Literature Search. First a manual search was conducted of the most recent six years of Psychological Abstracts. This search was primarily to locate literature reviews on the subject of male/female leaders. Using the references in the reviews that were found, other earlier reviews were then obtained. Nine comprehensive literature reviews were found: (O'Leary, 1974; Terborg, 1977; Brown, 1979; Larwood & Lockheed, 1979; Riger & Galligan, 1980; Hollander & Yoder, 1980; Bass, 1981; Powell, 1982; Staley, 1984). The bibliographies of these literature reviews were examined and many studies were obtained for possible inclusion in the meta-analysis.

The body of studies on hand was examined and it was determined which publications contained the largest number of studies or articles on male/female leadership. Three publications were searched page by page for possible information about male/female leaders that was hidden by an unrelated title. The three publications and the issues searched were: "Sex Roles" (Jan 85 - Mar 87); "Psychological Bulletin" (Jan 85 - Mar 87); "Journal of Applied Psychology" (Jan 85 - Feb 87). Five studies were obtained from the search of "Sex Roles," but no further studies were obtained from the other two publications.

Selection of Studies for Inclusion in Meta-analysis. The most important criteria for the inclusion of studies was whether or not the studies contained a measure of performance of the group under both male and female

leadership. Many of the studies that did contain some measure of performance did not report the figures if the differences between the groups led by males and the groups led by females were insignificant. Without some sort of statistic reported on the comparison of performance under the leadership of male and female leaders, it was impossible to include those studies in the meta-analysis as the procedure requires quantitative data.

Studies were included if they contained both objective and subjective measures of performance. An example of an objective measure of performance was the amount of time required to complete a puzzle or other task. A measure of the time it took groups led by females was compared to the time it took groups led by males. An example of a subjective measure was group performance as reported by the members of the group. Both subjective measures and objective measures were acceptable as long as the statistical data was reported separately on male and female leaders.

Both field and laboratory studies were included in the meta-analysis. The majority of the studies were lab studies. Some of the studies contained two separate measures of performance under different conditions with different groups. For example a study by Maier (1970) leaders (male and female) were presented a problem of work efficiency. They were to formulate a proposal that would increase the efficiency of a group of workers and get the

workers to accept their proposal. The leaders were given the scenario in two separate formats with different groups. Results for the performance of the groups under each format was reported separately. Both sets of results were included in the meta-analysis.

The studies selected for inclusion in the meta-analysis contained one or more set of results on performance of the group under male and female leaders. The studies were: Maier, 1970; Jacobson & Effertz, 1974; Bartol, 1975; Eskilson & Wiley, 1976; Vossler, 1977; Rice et al., 1980; Rice et al., 1984. The studies contained nine separate measures that were suitable for inclusion in the meta-analysis. The next section will focus on the procedures used in a meta-analysis and specific formulas used to convert the varied statistics into a common measure.

The Meta-Analysis

The procedure of meta-analysis requires that all studies have a common 'metric' or statistical measure. Since the studies provided the results in a variety of statistical forms (chi-square, t-tests, F-ratios), each result had to be transformed to a common construct. The construct chosen for this meta-analysis was effect size. Effect size indicates the impact of the results of a study. Using the common metric of effect size enabled a comparison of results across all the studies. Several different formulas were used to convert the various statistics in the

different studies. The formulas were obtained from two works on meta-analysis: Glass, McGaw, and Smith (1981) and Hunter, Schmidt, and Jackson (1982). Those formulas and the computations and results are contained in the following chapter of this thesis.

IV. Results and Discussion

Results

All statistics from each of the various studies were converted to the common 'd' statistic which represents effect size. The results of the conversions are contained in this section. Each study will be listed separately along with the necessary computations and formulas. A complete listing of the studies, the performance measure used and the statistics reported is contained in Table 1 on page 24.

The studies will appear in the same order that they are listed in Table 1.

Maier (1970)-Standard. This is one-half of the data reported by Maier. The entire study examined 96 leaders. The leaders were split into four groups of 24 each. One half of the groups were given a standard problem and the other half were given a problem consisting of facts only. The study contained data organized according to the two types of problems and so the data is reported the same way here.

This study reported a chi-square statistic. The transformation to d took several steps. The first step was to compute the Pearson r (r_{xy}). The formula is given on page 557ff of Kendall and Stewart (1967) cited in Glass, McGaw, and Smith (1981) on page 150.

Table 1: Summary of Meta-analysis Data

Study	Performance Measure	n1 (m)	n2 (f)	Means (m) (f)		Statistic	Effect Size=d
1. Maier (1970)	Changing work procedure (standard)	24	24	54.2	66.7	$\chi^2 = 3.02$	-.3772
2. Maier (1970)	Changing work procedure (facts only)	24	24	54.2	20.8	$\chi^2 = 7.38^*$	.5422
3. Jacobson & Effertz (1974)	# dominoes placed correctly	12	12	9.8	12.3	$F = 0.78$	-.3593
4. Bartol (1975)	Discounted rate of return on owner's equity in 'Executive' game	12	12	10.4	9.9	$t = 0.502$	.2048
5. Eskilson & Wiley (1976)	time to complete a puzzle	24	24	590	529	$F < 1$	.2041
6. Vossler (1977)	Plane Crash Survival: ranking of 15 items compared with expert ranking	60	48	74.5	76.8 (lower is better)	$F = 1.18$	.2107
7. Rice, Bender, & Vitters (1980)	#lines correctly placed on scale drawings and evaluation of written proposal	36	36	51.9	48.1	$F = 6.17^{**}$	.5845
8. Rice, Instone & Adams (1984)	Self-reported survey of unit effectiveness (cadet basic training-CBT)	764		not available		$F = 0.17$	.0298
9. Rice, Instone & Adams (1984)	Self-reported survey of unit effectiveness (cadet field training-CFT)	828		not available		$F = 1.74$	.0916

* significant at $p < .025$ **significant at $p < .02$

Below is the formula used to compute Pearson's r:

$$r_{xy} = (X^2 / X^2 + n)^{1/2} \quad (1)$$

where X^2 is the chi-square statistic, and n is the combined total of n_1 and n_2 . For this study the computations were:

$$\begin{aligned} r_{xy} &= (3.02 / 3.02 + 48)^{1/2} \\ &= .2433 \end{aligned} \quad (1)$$

The next step was to compute the point-biserial correlation (r_{pb}). The formula for the point-biserial was derived from the formula given on page 149 of Glass et al (1981).

$$r_{pb} = r_{xy} / [(n_1 * n_2)^{1/2} / un] \quad (2)$$

where u is the ordinate of the unit normal distribution, n_1 is the number of males, n_2 is the number of females and n is the combined total of males and females.

In order to obtain the necessary inputs for the formula, the reference cited in Glass et al. (1981) was consulted (Glass & Stanley, 1970). To obtain a value for u , Fisher's Z-transformation of r_{xy} was first performed using Table G on page 534 of Glass and Stanley (1970). The value for Z using an r_{xy} of .243 was .247. Having obtained a value for Z , the next step was to obtain a corresponding value of u using table B on pages 513-519 in Glass and Stanley (1970). The value of u which corresponded to a Z of .247 was .3876.

Thus the computation of r_{pb} follows:

$$\begin{aligned} r_{pb} &= .2433 / [(24 * 24)^{1/2} / .3876 * 48] & (2) \\ &= .1886 \end{aligned}$$

For small correlations, Hunter, Schmidt, and Jackson (1982) state on page 98, d is twice the value of r_{pb} . Therefore, d is $2(.1886)$ or $.3772$. Since the female mean was higher in this study, d was given a negative sign $(-.3772)$, to distinguish from the studies where the male mean was reported as higher (the d 's in studies with higher male means were given positive signs).

Maier (1970)-Facts Only. The results for this study were obtained the same way as the results for the previous study (Maier (1970)-Standard). Therefore only the computations are listed below. The previous study contains the derivations of the formulas. The computations follow:

$$\begin{aligned} r_{xy} &= (7.384 / 7.384 + 48)^{1/2} & (1) \\ &= .3651 \end{aligned}$$

$$\begin{aligned} r_{pb} &= .3651 / [(24 * 24)^{1/2} / .3712 * 48] & (2) \\ &= .2711 \end{aligned}$$

The value of Z with an r_{xy} of $.365$ was $.383$ and the corresponding u was $.3712$. As given with the computations of the previous study, d is twice the value of r_{pb} or $2(.2711)$ or $.5422$. This time the male mean was higher and therefore the d was given a positive sign.

Several of the studies contained a 't' statistic. Many others reported an 'F' statistic. Hunter, Schmidt, and Jackson (1982) point out that the 'F' statistic is equal to the 't' statistic squared. Therefore, where an 'F' was reported, it was converted to a 't' by taking the square-root because the 't' is more easily converted into the 'd' statistic.

The formula for converting the 't' statistic into the 'd' statistic is given on page 107 of the book 'Meta-analysis in Social Research' by Glass, McGaw and Smith (1981). In their book, Glass et al (1981) actually use the greek letter delta to represent effect size, but, for simplicity the symbol 'd' will be used throughout this thesis.

The formula for converting a t statistic is as follows:

$$d = t(1/n_1 + 1/n_2)^{1/2} \quad (3)$$

where n_1 is the number of males in the study, n_2 is the number of females in the study, and t is the reported t-statistic or the square root of the F-statistic.

Jacobson & Effertz (1974). An F-statistic was reported for this study (.78). The square root was taken to obtain a value for t of .88. Both n_1 and n_2 had a value of 12. The d was calculated as follows:

$$\begin{aligned} d &= .88(1/12 + 1/12)^{1/2} \\ &= .3593 \end{aligned} \quad (3)$$

Because the female mean was higher in this case, the effect size was given a negative sign (-.3593).

Bartol (1975). In this study, a t-statistic was reported and converted to the d as follows:

$$\begin{aligned} d &= .5017(1/12 + 1/12)^{1/2} \\ &= .2048 \end{aligned} \quad (3)$$

where t is .5017 and n_1 and n_2 are each 12. Since the male mean was larger than the female mean, the effect size was given a positive sign.

Eskilson & Wiley (1976). This study reported an F-statistic of 'less than one.' In order to perform the necessary calculations and include this study in the meta-analysis, the F value was estimated at .5. An F of .5 yields a t of .7071. The values of both n_1 and n_2 were 24. The computations follow:

$$\begin{aligned} d &= .7071(1/24 + 1/24)^{1/2} \\ &= .2041 \end{aligned} \quad (3)$$

The female mean was higher in this study and therefore the d was given a negative sign (-.2041).

Vossler (1977). This study reported an F-statistic of 1.1835 which converted to a t of 1.088. The n's in this study were not the same: n_1 was 60; n_2 was 48.

The computations follow:

$$\begin{aligned}d &= 1.088(1/60 + 1/48)^{1/2} \\ &= .2107\end{aligned}\tag{3}$$

The male mean was better (lower was better) than the female mean and therefore a positive sign was given to the d value (.2107).

Rice, Bender & Vitters (1980). This study reported an F of 6.17. This F was significant at less than .02. The t value obtained from this F was 2.48. The n's were equal and had a value of 36 each. The computations for d follow:

$$\begin{aligned}d &= 2.48(1/36 + 1/36)^{1/2} \\ &= .5845\end{aligned}\tag{3}$$

The male mean was higher than the female mean and so the d received a positive sign (.5845).

Rice Instone, & Adams (1984)-CBT. This portion of the Rice, Instone, and Adams (1984) study was performed using freshmen incoming to the U.S. Military Academy. The study was made during the 6-week training program, Cadet Basic Training (CBT). Since separate n's are not given for this study, the value of d must be obtained by first converting the F to the point-biserial r (r_{pb}). Using a formula on page 98 of Hunter et al. (1982) the r_{pb} was obtained:

$$r_{pb} = t/(t^2 + n - 2)^{1/2}\tag{4}$$

where t is the square-root of F and n is the combined total of the males and females. The computations for this study were:

$$\begin{aligned} r_{pb} &= .4123 / (.4123^2 + 764 - 2)^{1/2} \\ &= .0149 \end{aligned} \quad (4)$$

Because the r_{pb} was small, the value for d could be obtained by multiplying r_{pb} times two: $2(.0149)$ or $.0298$. The separate means were not reported in this case, but per telephone conversation with R. W. Rice (personal communication, June 24, 1987), it was determined that the male mean was slightly higher in both this study and the one to follow.

Rice Instone, & Adams (1984)-CFT. This portion of the study was performed using sophomore cadets at the U.S. Military Academy. The study was conducted during their 6-week summer training program, Cadet Field Training (CFT). Using the same procedure as the study above, the F of 1.74 was transformed into an r_{pb} first:

$$\begin{aligned} r_{pb} &= 1.319 / (1.319^2 + 828 - 2)^{1/2} \\ &= .0458 \end{aligned}$$

For small values of r_{pb} , the value of d is obtained as follows: $2(r_{pb})$ or $2(.0458)$ or $.0916$. As mentioned above, the male mean was slightly higher and therefore the d received a positive sign.

Overall Effect Size. To assess the average effect size across all studies, a measure for d is made. The formula for $\bar{d}$ was obtained from page 102 of Hunter et al. (1982):

$$\bar{d} = \sum (n_i * d_i) / \sum (n) \quad (5)$$

where n_i is the combined total of n_1 and n_2 for each study ($i = 1-9$) and d_i is the value for d obtained for each study ($i = 1-9$).

The computations for this meta-analysis are:

$$\begin{aligned}\bar{d} &= [(48 * -.3772) + (48 * .5422) + (24 * -.3593) \\ &\quad + (24 * .2048) + (48 * -.2041) + (108 * .2107) \\ &\quad + (72 * .5845) + (764 * .0298) + (828 * .0916)] \\ &\quad / (48 + 48 + 24 + 24 + 48 + 108 + 72 + 764 \\ &\quad \quad \quad + 828) \quad (5) \\ &= (-18.1056 + 26.0256 - 8.6232 + 4.9152 - 9.7968 \\ &\quad + 22.7556 + 42.084 + 22.7672 + 75.8448) / 1964 \\ &= 157.8668 / 1964 \\ &= .0804\end{aligned}$$

Therefore the value for $\bar{d}$ was .0804. The next step in assessing effect size across all the studies was to compute the variance of $\bar{d}$ ($\sigma_{\bar{d}}^2$). This formula was also given on page 102 of Hunter et al. (1982):

$$\sigma_{d_i}^2 = \sum [n_i (d_i - d)^2] / \sum (n_i) \quad (6)$$

The values needed for this formula are given in Table 2. The numbers in the left column correspond to the numbers given the studies in Table 1.

Table 2: Values for the Variance of $\bar{d}$

Study	d	d - $\bar{d}$	(d - $\bar{d}$) ²	n
1	-.3772	-.4576	.2094	48
2	.5422	.4618	.2133	48
3	-.3593	-.4397	.1933	24
4	.2048	.1244	.0155	24
5	-.2041	-.2845	.0809	48
6	.2107	.1303	.0170	108
7	.5845	.5041	.2541	72
8	.0298	-.0506	.00256	764
9	.0916	.0112	.000125	828

$$\begin{aligned}
 \sigma_{\bar{d}}^2 &= [(48 * .2094) + (48 * .2133) + (24 * .1933) \\
 &\quad + (24 * .0155) + (48 * .0809) + (108 * .0170) \\
 &\quad + 72 * .2541) + (764 * .00256) + (828 * .000125)] \\
 &\quad \quad \quad / 1964 \quad (6) \\
 &= 10.0512 + 10.2384 + 4.6392 + .372 + 3.8832 \\
 &\quad + 1.836 + 18.2952 + 1.9558 + .1035 / 1964 \\
 &= 51.3745 / 1964 \\
 &= .0262
 \end{aligned}$$

The variance due to sampling error was calculated using the following formula (also obtained on page 102 of Hunter et al., 1982):

$$\sigma_e^2 = \sum [n_i^4 / n_i (1 + \bar{d}^2 / 8)] / \sum (n_i)$$

Which reduces to

$$= [4 * (1 + \bar{d}^2 / 8) * k] / N \quad (7)$$

where k is the number of studies and N is the total of all the n's in all the studies. The computations and results follow:

$$\begin{aligned}
 \sigma_e^2 &= [4 * (1 + .0804^2 / 8) * 9] / 1964 \quad (7) \\
 &= .01834
 \end{aligned}$$

According to Hunter et al. (1982) if the parameters for the observed distribution are $\bar{d}$ and σ_d^2 then the actual distribution (corrected for error) would be $\bar{\delta}$ and standard deviation $\sigma_{\bar{\delta}}$ where

$$\begin{aligned}\bar{\delta} &= \bar{d} \\ &= .0804\end{aligned}\tag{8}$$

and

$$\begin{aligned}\sigma_{\bar{\delta}} &= (\sigma_d^2 - \sigma_e^2)^{1/2} \\ &= (.0262 - .01834)^{1/2} \\ &= .08866\end{aligned}\tag{9}$$

Using the values obtained above, a 95% confidence interval can be computed for $\bar{\delta}$:

$$\bar{\delta} \pm Z(\sigma_{\bar{\delta}})\tag{10}$$

where Z is from the standard normal distribution at 95 percent (1.96). Therefore the computation of the Confidence Interval (CI) is as follows:

$$\begin{aligned}\text{CI} &= .0804 \pm 1.96 * .08866 \\ &= -.089336 \text{ to } .250136\end{aligned}$$

Since the confidence interval contains zero, it was concluded that the actual value of the effect size across all the studies could be zero.

Discussion

The Meta-analysis. The meta-analysis indicated that there were no differences in performance of the group whether the leader was male or female. Even though a few of the studies had significant results, taken as a whole, there was no overall effect. The overall effect size was .0804 and it was shown that a 95 percent confidence interval around this value contained zero. Because .0804 was not significantly different from zero, it was concluded that there was no true effect.

This meta-analysis is unique in the leadership literature in that it summarized and reached conclusions on group performance as a function of leader's sex based on an exhaustive search of all available empirical literature and the accumulated results of all studies conducted and reported in this area. While numerous literature reviews have addressed the subject of leader's sex in relation to many variables (e.g., Brown, 1979; Bass, 1981), these reviews do not focus on the central issue of group performance nor do they reach conclusions based on quantitative decision-making procedures. Applying meta-analysis to issues such as the one addressed by this thesis clarifies the nature of the literature (i.e., characteristics, principle findings, etc.), identifies weaknesses, and points out new areas for exploration. The discussion will now consider the contributions of the meta-analysis reported here.

To begin, the meta-analysis corrected for deficiencies common to qualitative reviews. One such problem was that studies were considered to have the same effect regardless of sample size. The procedure of meta-analysis accounted for the differences in sample sizes. A review of the calculations would demonstrate that those studies with a greater sample size carried more weight than those with smaller sample sizes. Sampling error and error of measurement are two more factors that can cause differences in studies' results. This was taken into account when the variance due to sampling error was subtracted from the variance of $\bar{d}$. Having considered sample size, sampling error, and error of measurement using meta-analytic procedures, the research reported here found no overall effect for sex of the leader on group performance. Given no overall effect across the studies, what factors might account for differences among the studies?

Several factors seem to be possible "moderator variables" based on this review, that is they may have moderated the relationship between sex of the leader and group performance (e.g., sex composition of the group). Factors such as characteristics of the subjects may cause differences in study results. In the studies performed at the U.S. Military Academy (Rice et al., 1980; Rice et al., 1984), the subjects, both male and female, had similar prior leadership experiences. The cadets were accepted at the Academy because of prior demonstration of some

leadership ability. Because all cadets had to meet the same criteria for admittance, one would expect that there would be few differences in performance of groups with male or female leaders, given the highly select nature of these individuals. Not surprisingly, these studies showed no significant differences due to leader sex.

Other individual difference factors (such as age, attitudes, background data) can be uncontrolled variables. Bartol (1975) used undergraduate students as the subjects and found no significant difference between males and females. On the other hand, Maier (1970) found a significant difference using entry-level psychology students. Vossler (1977) used seventh and twelfth graders in the experiment and also found no significant difference.

One of the major differences in studies is whether the study was conducted in an organizational setting ("field") or in a laboratory setting ("lab"). Brown (1979) suggested that students and practicing managers differ in their perceptions of male-female leadership differences. Students tended to employ stereotypes more often than the managers did. Most practicing managers felt that there was no difference between male and female leadership styles while students did perceive a difference (Brown, 1979). This underscores the importance of field studies in generalizing about sex differences in leadership. Most of the studies reported here were done under laboratory conditions. Only two (Rice et al., 1980; Rice et al., 1984)

were field experiments, which were performed during actual cadet training at the U.S. Military Academy. This emphasizes the need for more field research, as opposed to lab research, when social scientists are examining differences between male and female leaders.

The Literature. A major finding of this review was how few studies have actually examined group performance as a function of sex of the leader. If sex of the leader makes any difference, the difference that should be most important is performance of the group led. Much of the research in the area of women has dealt with issues such as discrimination and socialization. Few studies were available that addressed the performance issue as evidenced by this research effort. After an extensive literature search, only seven studies were found that reported performance data although two of the seven studies consisted of two independent studies. Many more studies existed that addressed performance, but these studies did not report any performance data. Without the numerical data or statistical information, the studies could not be included in the meta-analysis. This represents a major problem with the existing literature. Researchers should be encouraged to present basic data or indicate where such data can be obtained. For this meta-analysis numerous attempts were made to contact authors to obtain

information. Some authors could not be located due to career relocations; others simply did not retain the basic data.

Another question concerns the large number of studies that look at perceptions of male and female leaders. Staley (1984) pointed out that much of the research done on male-female differences in leadership focused on subordinate perception or satisfaction. Little literature used the supervisor's perception as a criteria of measurement (Staley, 1974). Staley (1974) further stated that analysis of supervisor perception is important because it is not the subordinates that promote women, but the supervisors that do. Moreover, it is the supervisor of the leader that usually evaluates the ability of the leader and the performance of the group led.

This review also did not find longitudinal research in this area. Research in the area of male-female management differences is new and therefore little longitudinal field research might be expected. However, Terborg (1977) stated that this is a gap and more research needs to be done on the entire socialization process. Analyzing how women enter, function in, and rise in the managerial world would provide a bigger picture (Terborg, 1977). Terborg also mentioned that much of the information needed to perform such studies is available, but remains untouched.

This meta-analytic review has examined only one area that should be of concern to the Air Force and other

organizations as the number of women leaders increases. Hollander and Yoder (1980), for example, suggested several others. They concluded based on the research literature concerning male-female leadership differences that: (1) sex-role stereotypes are too often used as if they were behaviors, (2) findings from studies done on small groups were inappropriately generalized to larger groups and, (3) behaviors of women were considered gender characteristics as opposed to a function of the situation. Systematic research on such issues would benefit not only the women moving up the ladder, but also the organizations they work in.

Recommendations

In light of the findings of the meta-analysis and the gaps in the current research, the following recommendations are made:

1. More research should be done to examine actual group performance rather than just perceptual or attitudinal data. This meta-analysis was limited by the small number of studies. Consequently, moderator variables could not be explored. To develop models or understand relationships, more studies are required.
2. Performance data should be reported in all studies that address performance. Often studies on male/female issues could have reported performance data, but did not. The data existed, but was not

reported. Similarly, group performance studies should include data on the sex of the leader and sex composition of the group.

3. More emphasis should be placed on field studies. Studies done on women who have achieved leadership positions may provide more insight as to actual differences between males and females than laboratory studies have.

Conclusion

This thesis examined the empirical studies that had investigated group performance in relation to sex of the leader. A meta-analysis was performed to see if any effect in group performance existed due to sex of the leader. The meta-analysis indicated that sex of the leader had no effect on performance of the group.

Appendix A: Studies Included in Meta-analysis

1. Bartol, K. (1975). The Effect of Male Versus Female Leaders. Journal of Business Research, 3, 33-42.
2. Eskilson, A., & Wiley, M.G. (1976). Sex Composition and Leadership in Small Groups. Sociometry, 39, 183-194.
3. Jacobson, M.B., & Effertz, J. (1974). Sex Roles and Leadership and the Led. Organizational Behavior and Human Performance, 12, 383-396.
4. Maier, N.R.F. (1970). Male Versus Female Discussion Leaders. Personnel Psychology, 23, 455-461.
5. Rice, R.W., Bender, L.R., & Vitters, A.G. (1980). Leader Sex, Follower Attitudes Toward Women, and Leadership Effectiveness: A Laboratory Experiment. Organizational Behavior and Human Performance, 25, 46-78.
6. Rice, R.W., Instone, D., & Adams, J. (1984). Leader Sex, Leader Success, and Leadership Process: Two Field Studies. Journal of Applied Psychology, 69(1), 12-31.
7. Vossler, K.B. (1977). A Study of Group Effectiveness, Investigating the Variables of Sex, Age, and Residence. Dissertation Abstracts International, 38, 1869A. (University Microfilm No. 77-22728).

Appendix B: Studies not Included in Meta-analysis

1. Adams, J., Prince, H.T. II, Priest, R.F., & Rice, R.W. (1980). Personality Characteristics of Male and Female Leaders at the U.S. Military Academy. Journal of Political and Military Sociology, 8(1), 99-105.
2. Adams, J., Rice, R.W., & Instone, D. (1984). Follower Attitudes Toward Women and Judgements Concerning Performance by Female and Male Leaders. Academy of Management Journal, 27(3), 636-643.
3. Andrews, P.H. (1984). Performance-Self-Esteem and Perceptions of Leadership Emergence: A Comparative Study of Men and Women. Western Journal of Speech Communication, 48(1), 1-13.
4. Bartol, K.M. (1974). Male Versus Female Leaders: The Effect of Leader Need for Dominance on Follower Satisfaction. Academy of Management Journal, 17(2), 225-233.
5. Bartol, K.M., & Butterfield, D.A. (1976). Sex Effects in Evaluating Leaders. Journal of Applied Psychology, 61(4), 446-454.
6. Bartol, K.M., & Wortman, M.S. (1976). Sex Effects in Leader Behavior Self-Descriptions and Job Satisfaction. Journal of Psychology, 94, 177-183.
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8. Bormann, E.G., Pratt, J., & Putnam, L. (1978). Power, Authority, and Sex: Male Response to Female Leadership. Communication Monographs, 45(2), 119-155.
9. Brass, D.J. (1985). Men's and Women's Networks: A Study of Interaction Patterns and Influence in an Organization. Academy of Management Journal, 28(2), 327-343.
10. Brown, V., & Geiss, F.L. (1984). Turning Lead into Gold: Evaluations of Men and Women leaders and the Alchemy of Social Consensus. Journal of Personality and Social Psychology, 46(4), 811-824.
11. Bullard, P.D. & Cook, P.E. (1975). Sex and Workstyle of Leaders and Followers: Determinants of Productivity. Psychological Reports, 36, 545-546.

12. Butterfield, D.A., & Powell, G.N. (1981). Effects of Group Performance, Leader Sex, and Rater Sex on Ratings of Leader Behavior. Organizational Behavior and Human Performance, 28, 129-141.
13. Cohen, S.L., Bunker, K.A., Burton, C.A., & McManus, P.D. (1978). Reactions to Sex-Role Congruency of Immediate Supervision. Sex roles, 4(2), 297-311.
14. Cook, A.K., Howell, R.E., & Weir, I.L. (1985). Rural Leadership Programs and Changing Participation of Men and Women in Public Affairs. Journal of the Community Development Society, 16(1), 41-56.
15. Craig, J.M., & Sherif, C.W. (1986). The Effectiveness of Men and Women in Problem-Solving Groups as a Function of Group Gender Composition. Sex Roles, 14(7/8), 453-466.
16. Day, D.R., & Stogdill, R.M. (1972). Leader Behavior of Male and Female Supervisors: A Comparative Study. Personnel Psychology, 25, 353-360.
17. Dobbins, G.H., Pence, E.C., Orban, J.A., & Sgro, J.A. (1983). The Effects of the Leader and Sex of the Subordinate on the Use of Organizational Control Policy. Organizational Behavior and Human Performance, 32, 325-343.
18. Dobbins, G.H., Stuart, C., & Sgro, J.A. (1985). Cognitive Mechanisms Mediating the Biasing Effects of Leader Sex on Ratings of Leader Behavior. Sex Roles, 12(5/6), 549-560.
19. Dubno, P. (1985). Attitudes Toward Women Executives: A Longitudinal Approach. Academy of Management Journal, 28(1), 235-239.
20. Eagly, A.H. (1970). Leadership Style and Role Differentiation as Determinants of Group Effectiveness. Journal of Personality, 38, 509-524.
21. Ezell, H.F., Odewahn, C.A., & Sherman, J.D. (1980). Perceived Competence of Women Managers in Public Human Service Organizations: A Comparative View. Journal of Management, 6(2), 135-144.
22. Ezell, H.F., Odewahn, C.A., & Sherman, J.D. (1982). Women Entering Management: Differences in Perceptions of Factors Influencing Integration. Group and Organizational Studies, 7(2), 243-252.

23. Field, H.S., & Caldwell, B.E. (1975). Sex of Supervisor, Sex of Subordinate, and Subordinate Job Satisfaction. Psychology of Women Quarterly, 3, 391-399.
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25. Fleischer, R.A., & Chertkoff, J.M. (1986). Effects of Dominance and Sex on Leader Selection in Dyadic Work Groups. Journal of Personality and Social Psychology, 50(1), 94-99.
26. Geiss, F.L., Boston, M.B., & Hoffman, N. (1985). Sex of Authority Role Models and Achievement by Men and women: Leadership Performance and Recognition. Journal of Personality and Social Psychology, 49(3), 636-653.
27. Graves, L.M., & Powell, G.N. (1982). Sex Differences in Implicit Theories of Leadership: An Initial Investigation. Psychological Reports, 50, 689-690.
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29. Izraeli, D.N. (1985). Sex Differences in Self-Reported Influence Among Union Officers. Journal of Applied Psychology, 70(1), 148-156.
30. Izraeli, D.N., & Izraeli D. (1985). Sex Effects in Evaluating Leaders: A Replication Study. Journal of Applied Psychology, 70(3), 540-546.
31. Jago, A.G., & Vroom, V.H. (1982). Sex Differences in the Incidence and Evaluation of Participative Leader Behavior. Journal of Applied Psychology, 67(6), 776-783.
32. Jenö, K.S. (1978). the Effects of Situational Factors on Sex Differences in Small Group Behavior. Dissertation Abstracts International, 39, 443B. (University Microfilms No. 78-10630).
33. Kaufman, C.G., & Shikier, R. (1985). Sex of Employee and Sex of Supervisor: Effect on Attributions for the Causality of Success and Failure. Sex Roles, 12(3/4), 257-269.

34. Kelly, J.A., Wildman, H.E., & Urey, J.R. (1982). Gender and Sex Role Differences in Group Decision-making Social Interactions: A Behavioral Analysis. Journal of Applied Social Psychology, 12(2), 112-127.
35. Keown, C.F. Jr., & Keown A.L. (1982). Success Factors for Corporate Woman Executives. Group & Organization Studies, 7(4), 445-456.
36. Kerr, N.L., & MacCoun, R.J. (1984). Sex Composition of Groups and Member Motivation II: Effects of Relative Task Ability. Basic and Applied Social Psychology, 5(4), 255-271.
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38. Kushell, E., & Newton, R. (1986). Gender, Leadership Style, and Subordinate Satisfaction: An Experiment. Sex Roles, 14(3/4), 203-209.
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40. Megargee, E.I. (1969). Influence of Sex Roles on the Manifestation of Leadership. Journal of Applied Psychology, 53(5), 377-382.
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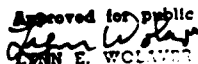
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Abstract

→ The purpose of this study was to summarize the effects of women leaders on organizational performance. This thesis examined those studies which have dealt with leadership differences in male and female managers/leaders and the effects of these differences on performance. The statistics reported in each study were systematically converted to a common measure known as effect size. The results of all studies were then combined in a procedure known as meta-analysis. Meta-analysis is systematic and replicable and therefore can lead to conclusions that are more generalizable than traditional review methods.

The issue of women leader's effects on performance is important because the number of women in the United States military has grown in the past four decades from two percent to over eleven percent. Over the next five years the Air Force is expected to increase its percentage of women to 20 percent of the total force.

The results indicated no significant difference in performance of an organization whether led by a male or a female. Any differences that did occur could be attributed to other factors besides sex of the leader. Key words:

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