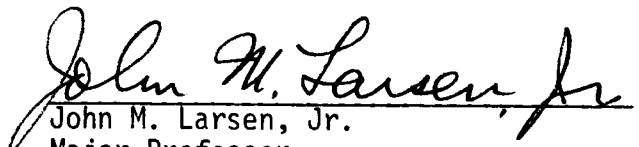
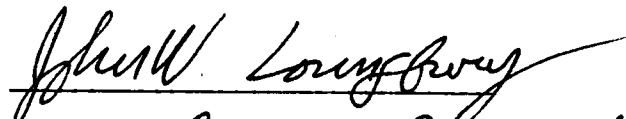


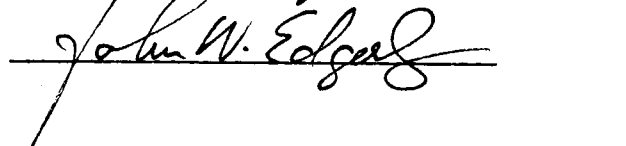
To the Graduate Council:

I am submitting herewith a dissertation written by Paulette A. McCarty entitled "One More Time: Why Aren't Women Making It to the Top? An Investigation of the Relationship between Sex, Self-Confidence, and Feedback." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Industrial and Organizational Psychology.


John M. Larsen, Jr.
Major Professor

We have read this dissertation
and recommend its acceptance:





Accepted for the Council:


Vice Chancellor
Graduate Studies and Research

ONE MORE TIME: WHY AREN'T WOMEN MAKING IT TO THE TOP?
AN INVESTIGATION OF THE RELATIONSHIP BETWEEN
SEX, SELF-CONFIDENCE, AND FEEDBACK

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Paulette A. McCarty

December 1981

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DEDICATION

To H. M. F., Jr. and A. K. F.,
who define the boundaries of the worthwhile universe.

ABSTRACT

The purpose of this study was to examine the effects of externally mediated feedback on task self-confidence. The fundamental hypotheses were that providing the same performance feedback to men and women working on an identical ambiguous task would result in similar levels of self-confidence.

Hypotheses were tested within a completely randomized $2 \times 3 \times 3$ repeated measures mixed design. There were two levels of sex (male and female), three levels of feedback (positive, negative, and none) and each subject was measured at three separate times for self-confidence. All experimental subjects were students in the College of Business at Northeastern University, Boston, Massachusetts.

An unweighted means ANOVA and planned comparisons were conducted to test the hypotheses generated for the dependent measure. Significant results were obtained for sex differences in self-confidence in the absence of feedback with males consistently reporting higher scores than females. However, no support was found for the hypotheses that feedback could mitigate these sex differences. In the presence of both positive and negative feedback, men gave significantly higher confidence estimates than women.

Two major implications were drawn from the study: first, sex differences in self-confidence may be greater than has been previously recognized; and, second, while feedback does have the ability to influence one's expectancy of success on a task, it does not appear to equalize the self-confidence levels of males and females.

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CHAPTER I

INTRODUCTION

Much research in achievement behavior has been carried out using a motivational model in which two terms, expectancy and valence are central concepts (Lawler, 1971; Porter & Lawler, 1968; Vroom, 1964). Expectancy refers to an individual's subjective probability that a certain behavior will be followed by a particular outcome. More specifically, it consists of two related parts. The individual must first assess his/her ability to perform at a certain level (effort-to-performance expectancy) and then decide whether performance at this level will lead to certain outcomes (performance-to-outcome expectancy). Valence is simply the attractiveness of any outcome or consequence. What is important to note is that the person's belief about his/her response capabilities (which may or may not be congruent with actual ability) represents the first link in the motivational chain. According to the theory, positive incentives or goal desirability will have little effect if people believe that they are incapable of the necessary level of performance to attain a given reward.

The role played by one's E→P expectancy takes on special significance in light of the repeated research finding that self-confidence is lower among females than males (Lenney, 1977). The term self-confidence is generally understood to mean how individuals perceive their ability to succeed at a particular endeavor and judge their effectiveness once a task is finished. This variable is usually measured in the form of a

competency question (or E→P expectancy) such as, "How well do you expect to do on this exercise?," "What are your chances of passing this test?," or "How many of the following items do you think you can solve?" Across a wide variety of experimental situations, women are more likely than men to underestimate their potential to excel at a given task and also to give lower self-evaluations of their completed performance (Maccoby & Jacklin, 1974, pp. 154-155). That these tendencies can have a debilitating effect on the achievement of women is suggested by a variety of studies which demonstrate how a person's actions are dictated by initial cognitions about his/her chances for success.

First, the intentions a person has with regard to performance can affect how much effort is expended working on a given task. For example, Feather (1963) found that college age subjects who had high expectations of doing well on a difficult perceptual reasoning problem persisted significantly longer in an attempt to solve it than did subjects who were originally pessimistic about their chances to succeed. Similarly, Battle (1965) discovered that for junior high students of both sexes, initial confidence about mathematical ability predicted the amount of time spent working on a demanding math puzzle ($r = .47$, $p < .001$).

Second, a substantial body of research exists which suggests that task self-confidence is related to actual performance. This finding is particularly strong in studies using academic achievement as the dependent variable. Battle (1966) discovered that school performance appears to be mediated by the grades one expects to get. In her samples of seventh-, eighth-, and ninth-graders, attitudes about future school

achievement, specifically expected grades in English and math, related positively and significantly to the grades received ($p < .001$ for both sexes). Simon and Feather (1973) found that subjects who passed a final exam in a psychology course had had higher ratings of initial confidence to do well on the test ($p < .001$). Other findings illustrating a link between perceived capability and actual accomplishment in academic settings are also available. For example, Todd, Terrell and Frank (1962) found that students with greater expectancies of academic success were more likely to be the "normal" achievers than the "underachievers." A report on the Equality of Educational Opportunity demonstrated that in a nationwide study of approximately one million children in grades six, nine, and twelve, school achievement was better predicted by self-estimates of ability than by any of the thirty or so other attitudinal, demographic, and situational variables studied (Coleman et al., 1966).

In several studies using a nonacademic criterion, Feather (1965, 1966, 1969) and Feather and Simon (1973) reported that subjects who stated that they were initially confident obtained higher scores on an anagrams test than those subjects who were initially pessimistic about their ability ($p < .01$, $p < .05$, respectively). In a field study using white collar workers, O'Reilly (1974) discovered that those employees whose self-perceptions indicated they had the abilities necessary for the job did, in fact, perform at a higher level than those who felt less qualified for their positions. Similarly, Dachler and Mobley (1974) found that for employees who had been on the job for at least two years,

there was a significant positive correlation ($r = .46$) between their stated work goals and their actual output.¹

Of course, many of the performance effects outlined in the above investigations could be accounted for by the fact that it is the more competent individuals who are expressing greater confidence; that is, they are not doing better solely because of higher aspirations, but rather because they also have greater skills in the areas under investigation. While actual ability is undoubtedly an important predictor of competence in many situations, it seems reasonable to assume that confidence in one's ability to perform well can still do much to facilitate the kinds of cognitive processes (e.g., recognition, discrimination) which lead to correct problem solution (Crandall, 1969). In fact, there is evidence that intentions "are a more powerful determinant of performance than is ability when the two factors are in opposition" (Battle, 1966, p. 641). In two separate research projects, Battle (1965, 1966) noted that students who were above average in IQ but had low levels of confidence about their school work were rated significantly more poorly in terms of classroom performance than those students who had high estimations for success but below average IQs ($p < .05$).

¹If one makes the assumption that goals assigned by an external source are accepted by the individual in such a way that they come to be internalized as the individual's own task expectancy, then a large number of goal-setting research results which show that difficult goals lead to greater performance than easy goals (cf. Locke, 1968) could be included here as additional evidence that conscious intentions affect the level at which people perform.

Finally, additional information regarding the potential impact of low self-confidence on job performance is suggested by Aronson and Carlsmith (1962) and Julian, Regula, and Hollander (1968). In the former work, it was found that individuals tended to suppress high performance outcomes (which had been experimentally manipulated) when they were out of line with their own low perceptions of ability. In the second study, researchers discovered that female students who were unsure of their performance on a conformity exercise were also more susceptible to the incorrect responses of other subjects.

In summary, the evidence points rather convincingly to the conclusion that low self-confidence is likely to pose a significant barrier to a woman's achievement in at least three ways. Since women report less confidence than men about their potential to excel in any given profession (Feldman-Summers & Kiesler, 1974), it follows from the work of Feather (1963) and Battle (1965) that they would also exhibit less initiative than men in trying to overcome career obstacles. This may help explain why so many women are found in low-status, dead-end positions (Day & Stodgill, 1972). Further, the research shows that low self-confidence may serve a debilitating function by preventing optimum performance. Low productivity on the part of women would certainly exacerbate (indeed, legitimize!) the well-documented trend to discriminate against females by refusing them the same rewards and opportunities as men (Terborg & Ilgen, 1975). Finally, the possibility that low self-confidence results in a tendency to reduce high levels of performance or to be more easily persuaded by one's cohorts bodes unfavorably for

the general acceptance and advancement of women in organizational settings.

Statement of the Problem

Clearly, because of the impact of low self-confidence on the behavior of women, researchers need to explore the possibility of eliminating this obstacle. A recent review of the self-confidence literature indicates that at least one situational variable—feedback—appears to moderate the tendency of women to denigrate their chances for success. Lenney (1977) reports that women's confidence levels have been found to be significantly lower than those of men in the absence of feedback but equal to those of men in the presence of feedback. That feedback should assist males and females in equalizing their estimates of task capability is hardly surprising since one of the major roles played by feedback is to inform the recipient of the level of performance attained by his/her current effort (Latham & Yukl, 1975). That is, the question, "At what level can I perform if I try?," can best be answered only after having received some cues regarding task success or failure and, identical information should logically result in identical responses for both sexes.

Unfortunately, while there is an impressive body of research which demonstrates that feedback has a positive effect upon performance (Ammons, 1956; Bilodeau & Bilodeau, 1961), there is no empirical proof that feedback specifically affects behavior by influencing E→P expectancies. In fact, there has been little concern for verifying

any underlying psychological processes triggered by feedback (Ilgen, Fisher & Taylor, 1979). Therefore, the focus of this research endeavor is twofold: first, to determine the validity of a relationship between feedback and self-confidence and; second, to ascertain whether this relationship is the same for men and women. Up until this point, the interaction between sex, feedback, and self-confidence has been inferred primarily from post hoc examination of results across separate studies rather than from comparisons between conditions within the same study.

CHAPTER II

LITERATURE REVIEW

Overview of Feedback

The growth of literature regarding the unsuccessful integration of women into nontraditional career paths and positions of power within organizations (cf. Terborg, 1977) reflects the increasing significance of this theoretical area. In the present study the focus is on an important topic within this research domain; namely, that women display lower self-confidence than men in many achievement settings (Maccoby & Jacklin, 1974, p. 155). The purpose in this review section is to discuss studies which highlight the positive role feedback may play in mitigating sex differences in self-confidence.

Most research from which information on feedback and self-confidence is culled involves a similar research design. Subjects are asked to make a private expectancy statement before beginning an unfamiliar task. Additional expectancies are often requested after each trial or block of trials and, upon completion of the task, subjects may be asked to give a final evaluation of their performance. In some studies, feedback¹ is provided to the subjects during the course of the experiment, but in other cases the individuals are not provided with any information

¹Although feedback is a complex stimulus, it will be defined simply in this paper as any process in which some source conveys a message to a recipient.

regarding task success or failure. Confidence estimations of women vary significantly depending upon the presence or absence of the feedback factor (Lenney, 1977).

In the Presence of Feedback

In her 1977 article, Lenney noted that "sex differences in self-confidence are not likely to occur when individuals obtain clear information on their abilities at the task in question" (p. 4). Contrary to this conclusion, material reviewed in the following section suggests that not all feedback has the same potential to equalize the achievement expectations of males and females. As Ilgen, Fisher and Taylor (1979) point out:

All feedback originates from some source. Technically, the source is not part of the feedback. However, it is often difficult to separate the effect of the source. Usually the two are confounded. To understand the effects of feedback upon behavior, it is necessary to identify the source and to ascertain the source's influence on the response. (p. 350)

Of the three sources of feedback listed by Ilgen et al.—the task, other individuals, and the self—only the first two, which are externally mediated, appear to have the power to influence the performance estimations made by women. Self-judgments seem to have little effect in helping women revise their achievement expectations upward. The role feedback plays in influencing self-confidence is addressed in the following review by categorizing studies based on the method used to supply information to the subject in each study.

First, there are those experiments in which the task itself supplies immediate feedback to the performer. For example, if an

individual is allotted thirty seconds to unscramble five letters to make a word, at the end of the time period, success or failure will be readily apparent. Sex differences in self-confidence are clearly eliminated (or reversed) when feedback is self-administered from working on the problem itself. In two similar investigations (Feather & Simon, 1971; McMahan, 1973), students of various ages worked on a set of five anagrams which had been manipulated to be easy or difficult and stated their confidence prior to each item or prior to taking a longer anagrams test. Results showed that males and females did not differ in their estimations of success. Using the same methodology, House and Perney (1974) made the surprising discovery that females gave significantly higher ratings of their performance potential than males [$F(1,72) = 4.12, p < .05$].

Second, there are research endeavors in which feedback is not inherent in the actual doing of the task. Performance assessment must come from an outside source who has observed or recorded the subject's behavior and is in a position to make an evaluation of it. In most laboratory experiments using this design, males and females do not differ in their estimations of their chances for success. As in the preceding category of studies, sex differences are eliminated (or reversed) when feedback is provided to the individual by a second party during or immediately after performance on the task. For example, when females received feedback regarding how much time they took to judge the similarity of pairs of letters during a practice session, they exhibited as much self-confidence as men in estimating their reaction times to the test stimuli (Brabender & Boardman, 1977). Rychlak and

Eacker (1962) had an experimenter give bogus scores to college students after each of six kinds of manual dexterity exercises. From test to test, males and females did not differ in the scores they thought they would earn. Similarly, Montanelli and Hill (1969) had young subjects sorting marbles from one bin to another under the watchful eye of a research assistant who administered supportive, critical, or neutral comments. Boys and girls did not differ in their estimations for potential success from one trial period to another. Hill and Dusek (1969) discovered that upon completion of an ambiguous perceptual task in which eight- and nine-year old children matched a test angle in a booklet with a standard angle mounted on the wall, girls who had been reinforced after each effort by encouraging comments from the experimenter (e.g., "That's good," "You're doing well") actually gave higher appraisals of the job they had done than boys who had been similarly rewarded [$F(1,48) = 4.18, p < .05$].

In only one study in this category did the results not follow the pattern outlined above. Nicholls (1975) found that despite the presence of clear feedback to fourth-grade subjects working at a practice session in angle-matching, boys had higher estimations than girls that they would do well on the actual test [$F(1,88) = 3.86, p < .05$]. The feedback in this case was provided by colored lights on a control panel in front of the subject. It may well be that the difference in favor of males was due to the nature of the information source. This was the only experiment in which a machine, rather than a human being, relayed results to the subjects. It is well known that the degree of credibility

attributed to the source can affect whether feedback is accepted by the individual (Giffin, 1967). If the person questions the expertise, the reliability, or the trustworthiness of the sender then there will be little desire to change behavior in light of the feedback. It seems plausible that young subjects, unaccustomed to being monitored by a mechanical device, may have doubted that the machine was judging their behavior accurately; thus, the females continued to underestimate their capabilities.

The final category of feedback studies to be investigated is that in which "individuals may be able to judge their own performance and, therefore, serve as their own source of feedback" (Ilgen, Fisher, & Taylor, 1979, p. 351). This would seem to be the case in those experiments where students are asked to predict their potential to excel in some school-related subject. Since grade reports and other performance indices are provided to youngsters from kindergarten on, both men and women should have fairly unequivocal knowledge about their school abilities when they are called upon to make judgments about educational attainment. In a surprising turn of events, girls tend to be more pessimistic than boys regarding their chances for future intellectual achievement, even though they get better grades than their male classmates throughout the school years (Maccoby & Jacklin, 1974, p. 135). Battle (1966) asked junior high students to indicate the grade "you really expect to get in English on your next report card for this grading period" (p. 636). Although boys chose English as their best subject and their favorite subject less often than girls, and felt less

strongly than girls that it was important to do well in this area, they still expected to get significantly better grades in English than girls! Similarly, Crandall (1969) gathered data from an entire college class. At registration, expectancy estimates were obtained in reference to the grade the student expected to receive in each course at the end of the term. Before any classes were taken, males' initial estimates of their probable grades were significantly higher than those of the females. Differences between the expectancies of the sexes continued for each of the remaining quarters of the analysis with the males consistently giving the higher levels. This was true even though there were no significant grade differences between the males and females. Based on grades received the preceding quarter, both sexes overestimated their next quarter's marks but this tendency was significantly greater for the males.

It seems contradictory that women's confidence levels are favorably affected by both task- and other-administered feedback but are apparently unaffected by a woman's self-knowledge of abilities, at least in those situations where academic success is being predicted. The reasons for this state of affairs are not entirely clear. One can speculate that females may actually question the credibility of their own evidence, much as they seem to have doubted the feedback from a machine in the Nicholls (1975) research. There are findings which show that women are prone to rate their achievements as being due to variable factors such as luck or chance rather than to their own actions (Feather, 1969). If women doubt whether ability was involved in their past successes, it

follows that they would be likely to refute self-derived knowledge of skills if there were no supporting environmental cues to substantiate their perceptions. This line of reasoning seems confirmed by two studies reported by Lenney (1977):

When Feather and Simon (1972) asked their introductory psychology students to indicate how confident they were of passing the first exam of the course, females were less confident than males. But when Simon and Feather (1973) asked the same question of students immediately prior to the final course examination, there were no sex differences in reported confidence. (p. 6)

It is reasonable to assume that before the final students had received external feedback in the form of grades, evaluations, etc., which gave the women an objective set of information on which to base their confidence levels. However, before their first test in a new field, students had to depend upon some subjective internalized sense of ability in making performance estimations. In the absence of external referents, women exhibited a tendency to denigrate their academic potential. This finding is supported by the results in the collection of studies which follows.

In the Absence of External Feedback

When subjects are faced with an unfamiliar problem for which they have no objective indication of their task specific abilities, females state that they anticipate doing (and having done) less well than males. It is the abundance of studies which support this finding that serve as the mainstay of the argument that there are sex differences in self-confidence. For example, Crandall (1969) presented young adults (18-26 years) with a novel intellectual task which required the storage,

recall, and reproduction of different patterns of geometric forms. Females started and ended the task with significantly lower estimates of their ability than did the men ($p < .05$, $p < .02$, respectively). Julian, Regula, and Hollander (1968) found that at midpoint in a conformity experiment, men were more confident than women of their performance ($p < .01$). At the conclusion of the study, women were less satisfied than men about their performance, and more often felt that they had been wrong in choosing the order in which stimulus lights appeared. In two separate endeavors, Rychlak and Eacker (1962) and Rychlak and Lerner (1965) discovered that college men had higher initial estimates of their potential to perform well on a series of manual dexterity tasks than did their female peers ($p < .01$ in both cases). Working with a younger sample, Crandall (1969) asked elementary age children to indicate the most difficult level at which they could perform six different kinds of intellectual tasks (e.g., solving "brain teasers," constructing jigsaw puzzles, etc.). The girls' mean estimates were lower than the boys' for each individual task ($p < .01$ for summed averages across tasks). Also using small children, Montanelli and Hill (1969) found that fifth-grade boys faced with a marble sorting problem were more confident about their chances of doing well than fifth-grade girls [$F(1,72) = 3.99$, $p < .05$]. Benton (1973) had subjects in a bargaining situation in which they had to negotiate a financial contract. Pregame measures showed that women expected to win less money and to be less potent and active in the impending session than men.

Although sex differences in self-confidence are often observed, they are rarely discussed because they are tangential to the major focus

of the study. An exception to this observation is found in the work of Rychlak and Lerner (1965) who attempted to explain the discrepancy between the expectancies of the men and women in their sample by saying that it was "doubtless due to the essentially masculine nature of the experimental task" (1965, p. 681). While this comment seems contradictory in light of their chosen manipulation (finger and hand dexterity) and the longstanding evidence that females excel in fine motor skills (Anastasi, 1958), it does focus attention on the impact of the sex-linkage of the research exercise. Since some of the tasks mentioned above are clearly ones in which men characteristically perform better, and since there is evidence that the sex-appropriateness of the task can influence how well the subject anticipates doing (Stein, Pohly, & Mueller, 1971), it might be argued that it is only the masculine association of the chosen exercises which has influenced the response patterns of the sexes. However, similar results can be obtained when investigators use tasks, such as anagrams, which are reported to be gender-free (Maccoby & Jacklin, 1974, p. 154). For example, Feather (1968, 1969) and Feather and Simon (1973) told college students that they would "pass" a test if they could solve one-half of the experimental anagrams (five out of ten) in the exercise booklet. In all cases, females gave lower ratings of their initial confidence to pass [$F(1,153) = 11.25, p < .005$; $F(1,201) = 25.56, p < .001$; $F(1,261) = 33.37, p < .001$, respectively]. House and Perney (1974) found that regardless of whether anagrams were presented as being particularly difficult or especially easy, college males consistently reported

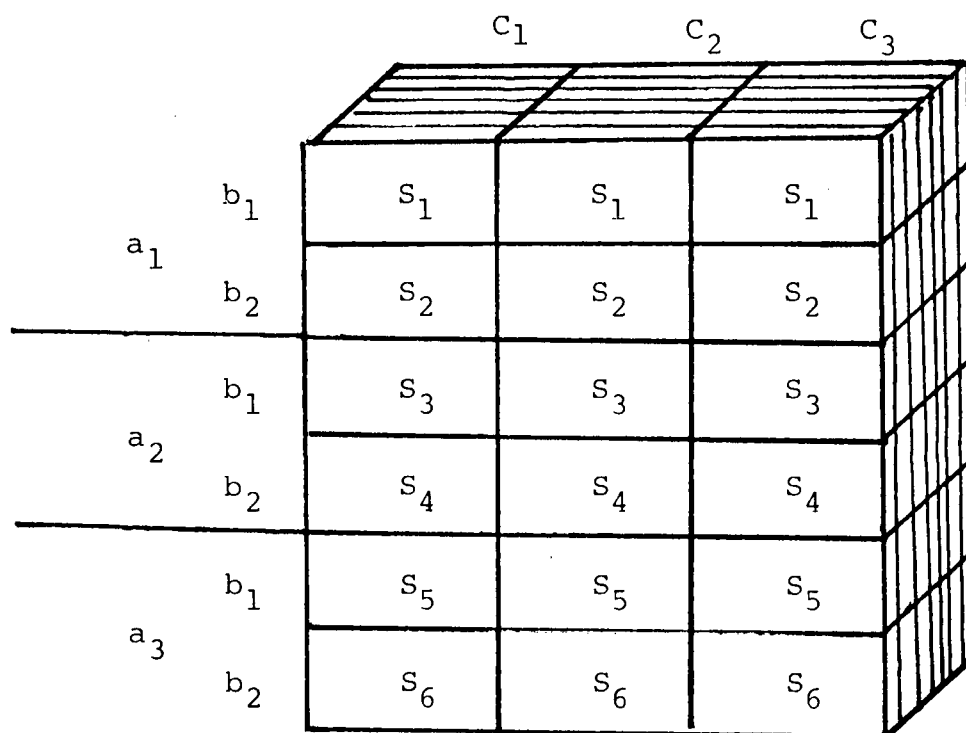
higher estimates of how many they thought they could solve in a given period [$F(1,106) = 14.7, p < .005$].

Summation and Statement of Research Hypotheses

The evidence presented in this chapter indicates that males tend to look on the bright side of their abilities while females are prone to underestimate their competencies, and, further, that external feedback may play an important role in mitigating this sex difference. Unfortunately, the latter finding is methodologically suspect having been derived by (1) examining studies in which feedback and self-confidence were not jointly the primary variables of the investigation; conveniently, they were often incorporated in the same experiments so that post-hoc examinations of their relationship were possible; and (2) comparing these post-hoc results to separate studies in which feedback was absent. Before researchers can endorse the use of feedback in therapeutic programs to remedy the low self-confidence of females, empirical verification of its influence must be established. Towards this end, in the present study a series of tasks was administered to control groups receiving no feedback and to experimental groups receiving either positive or negative feedback. See Figure 1 for a graphic layout of the experimental design.

In line with data discussed in the literature review, the following results were expected:

Hypothesis 1: Before beginning an unfamiliar task, women will have lower task self-confidence than men.



a = Feedback (positive, negative, none)

b = Sex (male, female)

c = Time

S₁...S₆ = Sets of n subjects

Figure 1. Graphic layout of the experimental design.

- Hypothesis 2: Across a task in which no external performance cues are supplied to the subject, women will report lower self-confidence than men.
- Hypothesis 3: In the presence of positive external feedback, males and females will not differ significantly in their self-confidence ratings.
- Hypothesis 3a: In the presence of negative external feedback, males and females will not differ significantly in their self-confidence ratings.

Additionally, there has been little investigation into the pattern of the interaction that emerges between type of feedback, sex, and self-confidence. Specifically, how does feedback close the gap in confidence between men and women? Evidence from personality research indicates that subjects who are low in ratings of perceived competence rely more on their job environments and less on their own self-perceptions to guide behavior while the reverse holds for individuals with high self-evaluations (Weiss, 1977). It follows, then, that women should be more responsive to information supplied to them while men should attend less to objective cues and more to their subjective feelings. This rationale seems verified by Brabender and Boardman (1977) who discovered that the more external feedback given to women regarding their performance on a perceptual task, the more accurate they became in judging their response times. Men's judgments were not affected by the increase in the availability of feedback.

Because females begin an unknown task with lower self-confidence than men and because they are more likely to "listen" to external feedback, the following hypotheses are tested:

Hypothesis 4: Females will raise their confidence levels more than men in the presence of positive feedback.

Hypothesis 4a: Females will lower their confidence levels less than men in the presence of negative feedback.

CHAPTER III

METHODOLOGY

Overview of Design

The experiment represents a repeated measures mixed design with two between—and one within—subjects variables (Myers, 1977). There are two levels of sex (male and female), three levels of feedback (positive, negative, and none), and each subject is measured at three separate times for self-confidence (see Figure 1).

Subjects

All students enrolled in a middler¹ level Organizational Behavior Course at Northeastern University were required to take part in this study and received points toward their class participation grade for their efforts. This provided an initial sample pool of approximately 200 students from which 114 males and 62 females were randomly utilized in the actual testing. Individuals who had previously performed the task (3), who saw through the experimental manipulation (5) or who did not understand the instructions (4) were dropped from the analysis.

¹Due to the five-year cooperative education system at Northeastern, students can attain a status of "middler" indicating that they are between their sophomore and junior years.

Task

The major consideration in selecting a task for the present research endeavor was that it be sufficiently novel and ambiguous to create a question in the subject's mind about how well s/he was performing. Thus, an external report from an informed source would be necessary in order for subjects to adequately assess their success or failure. This would allow the experimenter to manipulate feedback in a desired manner.

A task which is adaptable to the above criterion was developed by Guilford (1959) and is used frequently as a measure of creativity. It requires the subject to consider unique uses for ordinary objects such as a brick or newspaper. The instructions for the task read as follows:

In this exercise you will be asked to consider some common objects. In the space provided you are to list as many interesting and unusual uses as you can think of for each object. Do not limit yourself to the uses you have seen or heard about. Think of any new possible uses that you can.

Subjects in all conditions worked on the same three objects—a pencil, a wire hanger, and a cardboard box—which were presented in random order.

Procedure

Assignment of Subjects

Males and females were randomly assigned to experimental or control conditions which were distributed evenly during morning and afternoon sessions and on different days of the week. Experimental subjects were randomly designated to receive positive or negative performance results.

Administration of Treatment

Subjects in mixed sex groups of six or eight reported to the same room at a prearranged time. The testing facility contained a small desk for the experimenter and four long tables for the students. Two chairs and two exercise booklets had been intentionally spaced at each table to optimize the distance between subjects and prevent their ability to see each other's output and, in the feedback condition, the printed result cards. Once the subjects were seated, they were instructed by a prerecorded set of instructions to fill out the demographic data requested on the front page of their test booklet. Students were also requested to identify themselves by "selecting any four digit number you wish" and printing this number on their booklets.

Once the cover page had been completed, students were asked to open their test booklets and follow along as the instructions describing the requirements of their particular experimental condition were read aloud from the prerecorded tape. All students were informed that they were participants in a creativity project which was a joint endeavor of several academic institutions in the Boston area. By presenting the experiment as part of a larger project involving well known local colleges and universities, it was possible to convincingly add that a computer facility designed solely to process and tabulate creativity data was currently in operation in the same building.

Subjects were then told that they would have five minutes to work on each of three exercises in which they would develop unusual uses for some common objects. They were further instructed that their answers

would be compared to those of "hundreds of other students who have already participated in the study" and evaluated for both the quantity and quality of ideas, although the quality criterion would have greater weight in determining the overall score.² In the no-feedback conditions, subjects were told that their performance results would not be available until the following day. In the feedback conditions, subjects anticipated receiving coded results at the end of each work period.

Any questions concerning the experiment were answered at the conclusion of the instructions. Students then proceeded to work through their test booklets, completing three tasks and three confidence statements in accordance with the directions outlined on the tape. See Figure 2 for a schematic layout of the experimental design.

Scoring Procedure

Experimental subjects were required to remove their answer sheets from the booklet and give them to an assistant who ostensibly took them down to the computer facility for analysis. The assistant varied his absence from the room over a six- to eight-minute period, during which time he finalized the appearance of the feedback form (see below). While

²These instructions were intended to reduce suspicion which might arise when experimental subjects produced lists which did not "visually" match the feedback they received. For example, a subject randomly designated to receive positive feedback might produce an exceptionally short list of uses for a given object. However, a high score could be justified by saying that his/her ideas were more creative (i.e., high quality points) than those generated by others in the sample pool. Similarly, a subject who wrote a long list of uses could conceivably do poorly if the responses were those which were commonly elicited (i.e., low quality points).

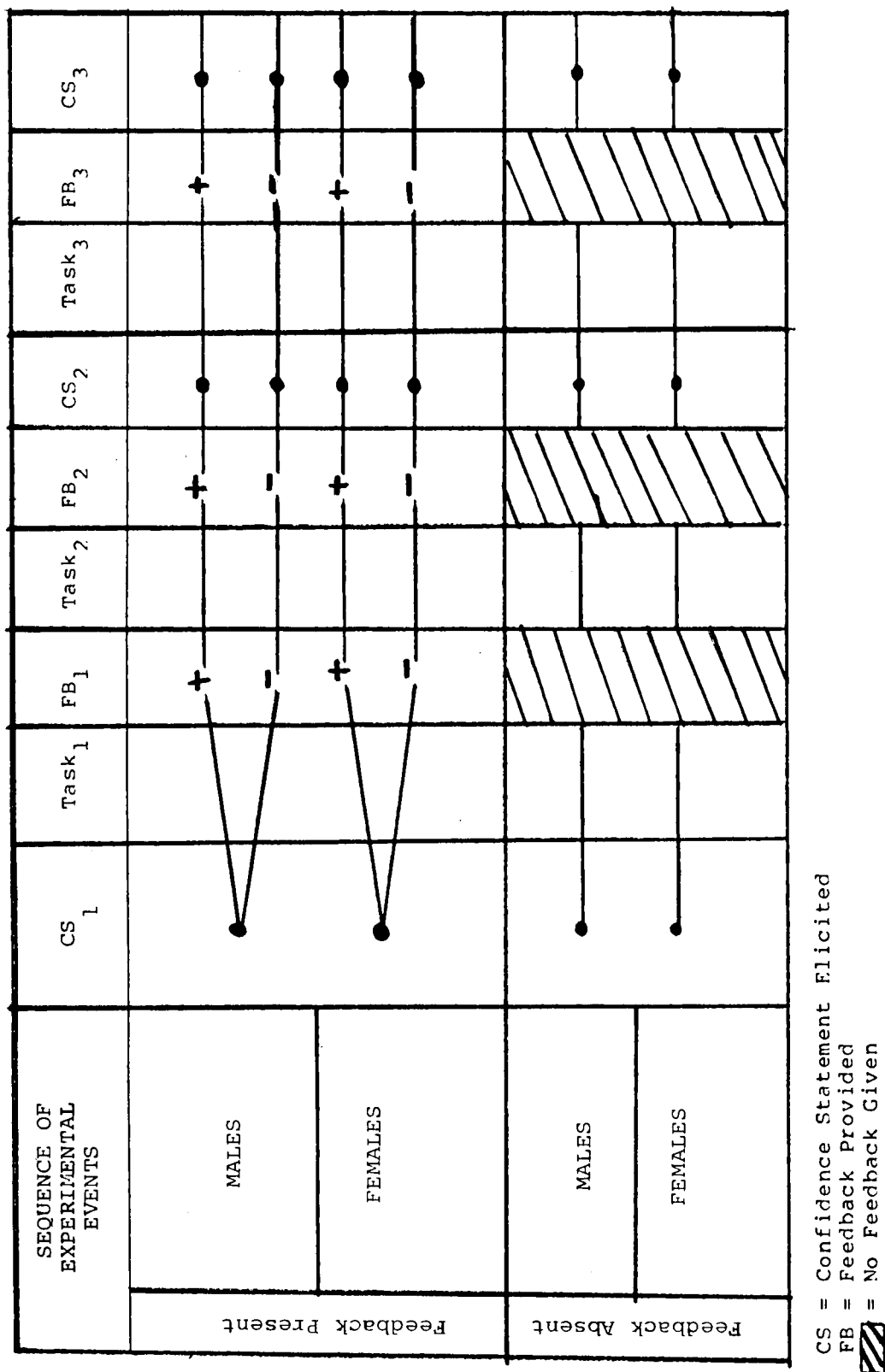


Figure 2. Schematic layout of experimental procedure.

the subjects were waiting for their results, they were told they could peruse the variety of current periodicals and newspapers stacked in the center of each table, do schoolwork, or wait quietly while their answers were being processed. Talking about the experiment was not allowed.

When the assistant returned, he distributed a computer card, with printed results across the top, to each student. See Figure 3 for an illustration of a typical score card. Upon receipt of the first results, subjects were instructed on how to interpret their scores. To insure that there were no errors in reading the cards, each student was asked to write out his/her results on a separate piece of paper. The assistant then verified these written responses for accuracy.

Feedback

Realistically introducing feedback into the laboratory setting was extremely difficult. Extensive pretesting of techniques was necessary before a successful manipulation of the feedback variable was discovered. What was needed was a format to relay bogus results which appeared to have been generated by the computer facility mentioned in the instructions and which seemed authentic in that it represented the subject's personal score (as opposed to a random handout).

These criteria led to the development of coded computer cards (three per subject) which had been prepunched with the following information (see Figure 3):

Card Columns:

- 1-11 random numbers ostensibly representing the date, the time, the experimental group, the University, etc.
- 14-31 the project name: Creativity.
- 34-44 the particular task just completed (pencil, box, hanger).
- 48-59 feedback in the form of a percentile score.

Students were told to interpret their feedback (e.g., 51) by completing the sentence, "This means that I have done better than 51 out of every 100 students who have taken this test." Since College Board Exams and other scholastic tests often use percentile scoring systems, it was assumed that students would have little difficulty understanding the results. However, it was clearly emphasized that the higher the score, the better the performance.

Based on findings from the pilot group, it was determined that scores on this type of task would be interpreted as follows: 0-25th percentile, low; 26-50th percentile, low average; 51-79th percentile, high average; 80-100th percentile, high.³ In line with these categories, students randomly assigned to negative feedback conditions received scores indicating that they performed in the 23, 25, and 30th percentiles while students designated to receive positive feedback were told they ranked in the 86, 88 and 92nd percentiles.

The final addition to the card was the four-digit ID number (cc 71-78) selected by each student at the beginning of the experiment. This code was typed onto the card by the assistant during his absence from the room and was intended to "convince" the subject that the results belonged specifically to him/her and had not been distributed arbitrarily to the waiting group. Based on the postexperimental reactions

³It is interesting to note that scores above the 80th percentile were considered to be high. This seems slightly out-of-line with what students would deem as above-average performance on a test. However, lower cut-offs seems to have been viewed favorably due to the nature of task. This seems verified by the fact that scores above the 95th percentile were judged to be "highly improbable."

of the subjects, personalizing the data in this way was highly effective in making the feedback credible.

Finally, all subjects were thoroughly debriefed and asked to refrain from talking about the experiment with other potential participants.

Criterion Measure

Self-confidence was measured for all subjects at three separate times in the experiment (see Figure 2):

1. Immediately after the instructions, but before working on the first task;
2. Prior to working on the final task; and
3. At the conclusion of the experiment.

Self-confidence was operationalized by measuring responses to the questions, "How confident are you that you can perform as well as other students on the following task(s)?" (asked at Time 1 and 2, above) and, "If you were to perform this same task in the future, how confident are you that you could perform as well as other students?" (asked at Time 3). The accompanying scale on which students marked their confidence ranged from 0 to 100 with the low end anchored by the statement, "Not confident at all," the middle point by the phrase, "Moderately Confident," and the high end by the words, "Completely Confident."

CHAPTER IV

RESULTS

Overview of the Presentation of Results

Results pertaining to characteristics of the sample and to the effectiveness of experimental manipulations are reported first. Results pertaining to tests of hypotheses are then presented on two levels of analysis. Initially, an overall test of hypotheses is presented using a $2 \times 3 \times 3$ analysis of variance. Results concerning specific hypotheses are presented, in turn, using planned comparison procedures.

The primary statistical techniques employed are analysis of variance (ANOVA) for unequal cell size (Winer, 1962) and various tests of differences between group means.

Demographic Data

Age and Nationality

Subjects ranged in age from 18 to 35 with a mean age for the 176 subjects of 21.32 years ($SD = 2.33$). Ninety-one percent of the total sample was American with the remaining 9% divided among diverse nationalities.

Two-by-three ANOVAS with age and nationality as dependent variables were conducted to ensure that there were no differences between experimental groups with respect to these variables. No significant effects ($p < .05$) were obtained in the analyses for either factor.

Task Perception

Since previous research has shown that the sex-linkage of a task can influence how well an individual anticipates doing on the task (Stein, Pohly, & Mueller, 1971), it was important to determine whether subjects perceived the creativity exercise as favoring one sex over another. Therefore, at the conclusion of each experimental session, subjects were asked to check one of the following comments:

In general, do you think that creativity exercises like the one you just completed tend to favor

- ☐ Male skills and abilities?
- ☐ Female skills and abilities?
- ☐ Neither male nor female skills and abilities; both sexes do equally well on them?

Seventy-two percent of the total sample felt that creativity exercises were neutral with regard to sex, while 20% of the respondents indicated that such tasks favored female skills and abilities, and 8% of the subjects marked that such tasks were better suited to male talents. Since the latter two opinions could produce reactions which were not connected with the experiment per se, a chi-square test was conducted to verify that subjects holding these viewpoints were distributed evenly across same sex cells. Results indicated no differences between cells in the number of male or female subjects holding sex-linked perceptions of the task ($\chi^2 = 5.99$, $DF = 2$, n.s.).

Experimental Measures

Stimulus and Feedback Order

Within each treatment condition, subjects were required to develop uses for three common objects presented in a variety of sequences in the

test booklets. Feedback was then administered to subjects in positive- and negative-feedback conditions after completion of each task. Although each subject received only one type of feedback, this feedback was introduced using a varied sequence of three numbers; e.g., for negative feedback subjects, the 23rd, 25th and 30th percentile scores were used; for positive groups, 86th, 88th, and 92nd percentiles were used.

To verify that there was randomization of stimulus objects within the different cells, a two-by-three ANOVA with order of presentation as a dependent variable was performed. No differences ($p < .05$) among experimental groups were obtained. To test whether randomization of feedback order within positive and negative conditions had been successfully achieved, a two-by-two ANOVA with feedback order as the dependent variable was conducted. Again, no significant effects ($p < .05$) with respect to this variable were noted.

These results indicate that changes in the dependent variable are not attributable to either the order in which the tasks appeared or the order in which feedback levels were administered.

Manipulation Check

Manipulation checks for feedback were conducted to ensure that the intended experimental conditions did occur. Specifically, it was necessary to confirm that subjects receiving positive feedback had higher confidence scores than subjects receiving negative feedback with the responses of no-feedback subjects falling between these two groups. A $2 \times 3 \times 3$ analysis of variance, with confidence responses of subjects in all feedback conditions as the dependent variable, confirmed a main

effect for feedback. The results of this analysis are presented in Table 1. Group means for the three feedback conditions are displayed in Table 2.

To determine which pairs of differences were contributing to the overall significant F of 63.43, an *a posteriori* Scheffé test was performed on the relevant data in Table 2. [Scheffé tests were chosen for all pairwise comparisons because of their statistical conservatism and their appropriateness for use with unequal N s (Kirk, 1968).] Results showed that confidence responses in positive and negative feedback groups were significantly different from responses elicited in the no-feedback condition ($S = 10.82$; $DF = 2,170$; $p < .05$ for all three comparisons). These findings confirm that the feedback manipulation in the experimental groups was highly effective.

Randomization of Subjects Within Experimental Conditions

Since in this investigation the focus is on changes in task self-confidence over time under various conditions of feedback, it was important to determine that there were no differences in self-confidence levels (of same sex groups) at the outset of the experiment. One-way ANOVAs, with Time 1 confidence scores as the dependent variable, were performed for both male and female subjects. Results showed no significant differences in initial confidence of same sex subjects in the three feedback conditions [$F = .51$ (males); $F = 1.29$ (females); *n.s.*].

Table 1
Analysis of Variance: Feedback by Sex by Time

Source	DF	Mean Squares	F	Prob.
<u>Between Subjects</u>				
Feedback	2	30394.36	63.43	$p < .01$
Sex	1	19454.76	40.62	$p < .01$
Feedback $\times$ Sex	2	852.07	1.78	n.s.
Error	170			
<u>Within Subjects</u>				
Time	2	3035.06	31.33	$p < .01$
Feedback $\times$ Time	4	7088.42	73.17	$p < .01$
Sex $\times$ Time	2	330.50	3.41	n.s.
Feedback $\times$ Sex $\times$ Time	4	178.61	1.84	n.s.
Error	340			

Table 2
Group Means for Significant Between Subjects Effects:
Sex and Feedback

Variable		Group Mean
Sex	Male	71.99
	Female	58.28
Feedback	Positive	79.82
	Negative	52.08
	None	67.32

$F_{\text{Sex}} = 40.619, p < .01.$

$F_{\text{Feedback}} = 63.427, p < .01.$

Tests of Hypotheses

A $2 \times 3 \times 3$ analysis of variance was performed as an overall test for hypotheses concerning sex and feedback effects. The dependent variable in the ANOVA was task-self-confidence measured at three separate times. The results of the ANOVA are shown in Table 1. Table 2 lists the group means for significant between-subjects effects. Table 3 lists the group means for significant within-subjects effects.

Between Subjects

Sex and feedback variables were both sources for significant between-subjects effects. An examination of the group means in Table 2 indicates that males gave significantly higher confidence scores than females (collapsing across feedback conditions and time). This main effect for sex was not unexpected since a difference between the scores of men and women has been anticipated at various intervals; specifically, at Time 1 in all three experimental conditions and at Time 2 and Time 3 in the no-feedback group. The strength of this finding suggests that at certain measurement points the differences in the scores of the sexes were substantial. However, the exact nature and location of these points can only be discovered by exploring the pattern of confidence scores in each of the experimental conditions.

The significant feedback results have already been discussed (see p. 33) and provide confirmation that the intended experimental manipulations did occur. In short, subjects responded appropriately to the good news, the bad news, and no news.

Table 3
Group Means for Significant Within Subjects Effects:
Feedback Across Time and Confidence
Scores Across Time

		Group Means		
		Time 1	Time 2	Time 3
Feedback	Positive	73.18	82.05	84.24
	Negative	70.89	43.39	41.96
	None	<u>70.28</u>	<u>66.20</u>	<u>65.46</u>
CSCRS Across Time		71.56	64.89	65.03

$F_{\text{Feedback across time}} = 73.17, p < .01.$

$F_{\text{Time}} = 31.329, p < .01.$

Within Subjects

Significant within-subjects effects were noted for time as well as for feedback across time. Regarding the latter, an examination of the information in Table 3 reveals that subjects receiving positive feedback increased their confidence scores across time, while subjects in negative- and no-feedback conditions decreased their responses. A posteriori Scheffé test on the group means revealed that in all three feedback conditions, significant changes in scores occurred between Time 1 and Time 2, and between Time 1 and Time 3, but not between Time 2 and Time 3. For each set of comparisons, mean differences exceeded the S value at $p < .01$.

The downward score trend noted in negative- and no-feedback groups explains why, in general, confidence scores (collapsed across sex and feedback) decrease over time.

Hypothesis 1: Initial Sex Differences in Self-Confidence

A t test was performed on the Time 1 confidence scores of males and females. The results of this analysis are presented in Table 4. The test for differences in initial confidence was significant, confirming Hypothesis 1. As indicated in Table 4, before beginning an unfamiliar task, men have higher confidence than women about their potential to perform well.

Hypothesis 2: Sex Differences in the Absence of Feedback

To determine whether sex differences in self-confidence persist across time in the absence of feedback, t tests were performed on all

Table 4
T Test for Initial Confidence Differences:
Males and Females

		Group Mean (Time 1)
Males	M	76.01
	SD	15.32
Females	M	63.39
	SD	17.41
		t = 4.97
		p < .000

DF = 174.

three confidence scores of males and females in the no-feedback condition. The results of these analyses are presented in Table 5. The tests for differences were both significant, confirming Hypothesis 2: across a situation in which no performance feedback is supplied to the subject, men have greater confidence than women that they can excel on the task at hand. A graphic display of this effect is shown in Figure 4.

Hypothesis 3 and 3a: Sex Differences in the Presence of Feedback

To assess whether males and females express similar confidence levels in the presence of feedback (i.e., scores recorded at Time 2 and Time 3) t tests were performed on the responses of subjects in both positive and negative feedback conditions. Table 6 displays the results of these analyses. Neither hypotheses was supported since the data reveal that men, in the presence of both positive and negative feedback, give significantly higher confidence estimates than women. Figure 5 depicts the relationships among the group means in the feedback groups.

Hypothesis 4 and 4a: Patterns of Interaction Between Sex and Feedback

The original analysis of variance (see Table 1, p. 34) was used to test whether males and females responded differentially to positive and negative feedback. The portion of the analysis relevant to this sex difference would be the feedback $\times$ sex interaction which was not significant ($F = 1.78$). Thus, males and females do not respond differently from one another to either type of feedback and neither hypothesis 4 nor 4a was supported. Figure 5 illustrates the similarities in the response patterns of men and women.

Table 5
T Tests for Confidence Differences: Males and Females
(No Feedback Conditions)

		Group Means		
		Time 1	Time 2	Time 3
Males	M	77.35	73.09	71.32
	SD	18.32	22.47	20.09
Females	M	58.25	54.50	55.50
	SD	12.70	13.27	10.79
		t=4.51	t=3.36	t=3.25
		p<.000	p<.001	p<.002

DF = 52 for each t test.

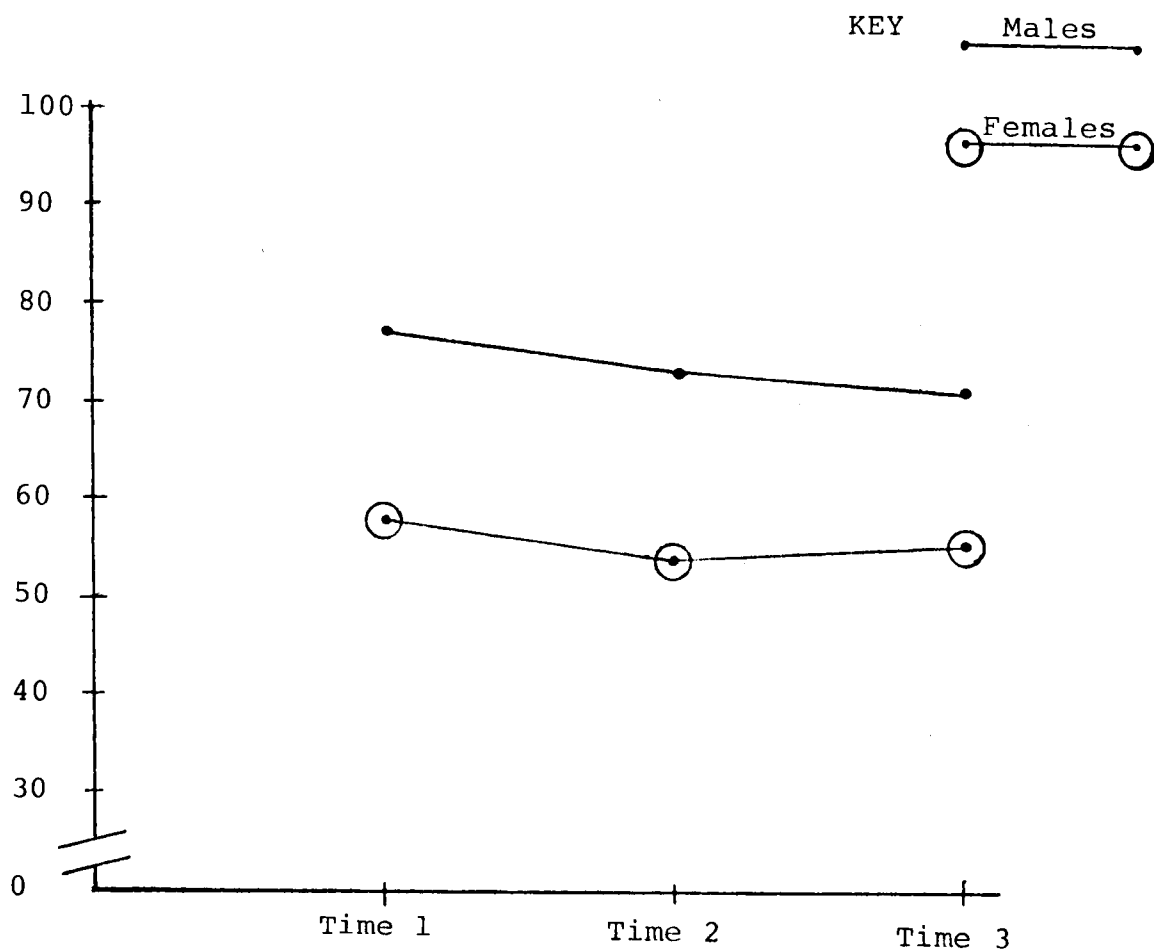


Figure 4. Sex differences in self-confidence in no feedback conditions.

Table 6

T Tests for Confidence Differences: Males and Females
(Positive and Negative Feedback Conditions)

		Group Means			
		Positive Feedback		Negative Feedback	
		Time 2	Time 3	Time 2	Time 3
Males	M	85.00	86.20	50.57	44.86
	SD	10.55	5.76	16.97	13.85
Females	M	75.71	80.00	31.43	37.14
	SD	15.60	10.49	12.86	9.69
		t = 2.84	t = 3.11	t = 4.45	t = 2.24
		p < .006	p < .003	p < .000	p < .03

DF = 64 for positive feedback;
54 for negative feedback.

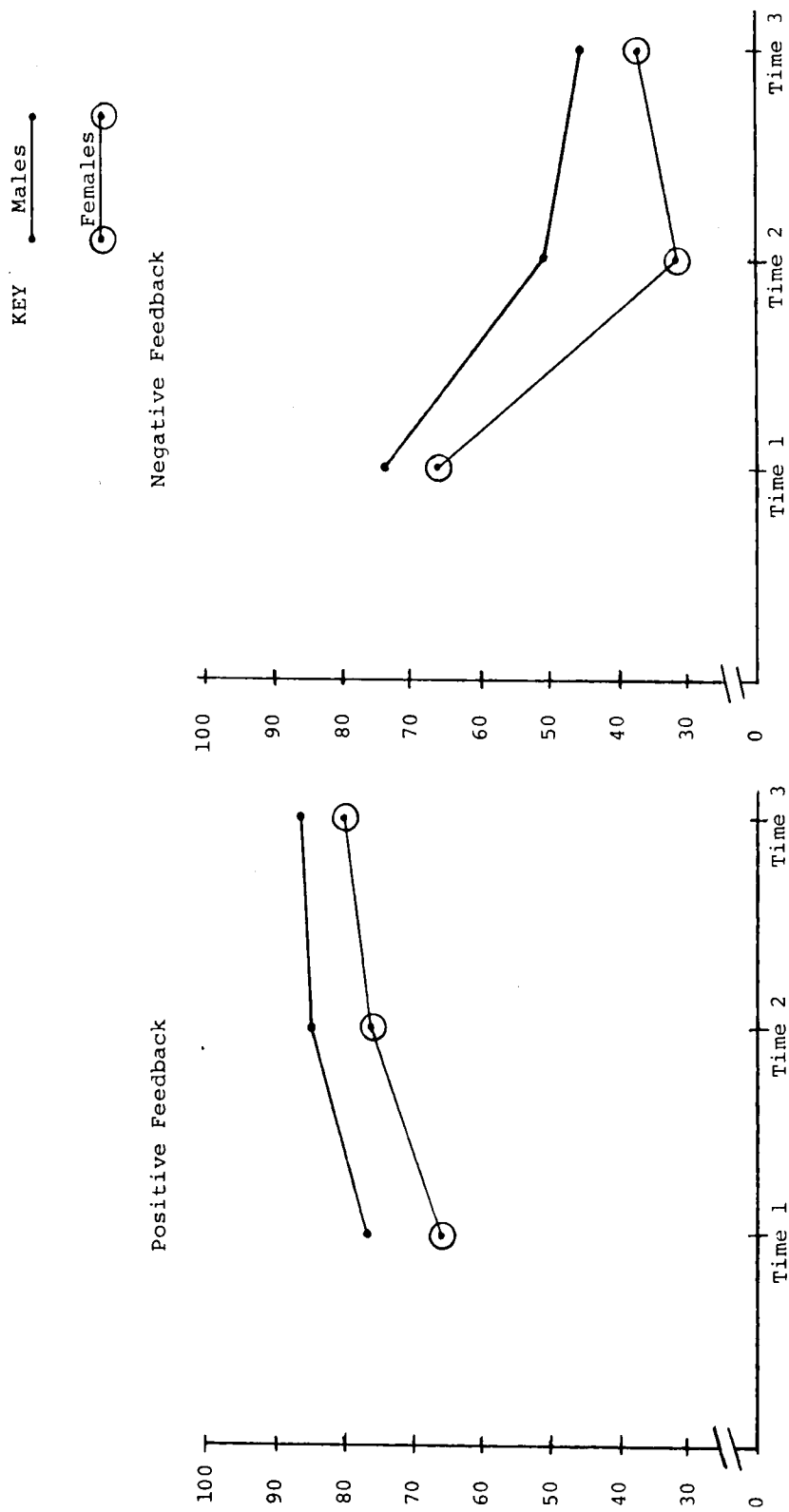


Figure 5. Sex differences in self-confidence in positive and negative feedback conditions.

Planned Comparisons

Although the overall F value for the feedback $\times$ sex $\times$ time interaction was not significant ($F = 1.84$), planned comparisons between confidence scores were carried out for the same sex subjects in each experimental condition to determine the effect of feedback on the dependent measure across time. The pattern of results is exhibited in Table 7.

In the no feedback treatment, there were significant score decreases from Time 1 to Time 3 for men and from Time 1 to Time 2 for women. In the negative feedback groups, male scores decreased at each interval: from Time 1 to Time 2, Time 2 to Time 3, and Time 1 to Time 3, while female scores declined only from Time 1 to Time 2 and Time 1 to Time 3. The positive feedback resulted in an increase in confidence for both sexes from the first to the second and the first to the third measurements.

Table 7
Planned Comparisons Between Confidence Scores

Group Means			Time 1	Time 2	Time 3
Males	No Feedback	Time 1 = 77.35 Time 2 = 73.09 Time 3 = 71.32	-	4.26 - -	6.03* 1.77 -
	Negative Feedback	Time 1 = 73.86 Time 2 = 50.57 Time 3 = 44.86	-	23.29** - -	29.00** 5.71* -
	Positive Feedback	Time 1 = 76.67 Time 2 = 85.00 Time 3 = 86.22	-	-8.33** - -	-9.55** -1.22 -
Females	No Feedback	Time 1 = 58.25 Time 2 = 54.50 Time 3 = 55.50	-	3.75* - -	2.75 -1.00 -
	Negative Feedback	Time 1 = 65.96 Time 2 = 31.43 Time 3 = 37.14	-	34.25** - -	28.81** -5.71 -
	Positive Feedback	Time 1 = 65.71 Time 2 = 75.71 Time 3 = 80.00	-	-10.00** - -	-14.29** -4.29 -

*p < .05.

**p < .001

CHAPTER V

DISCUSSION

Contribution of the Study

Social and employment trends indicate that increasing percentages of women are rejecting traditional views of sex-appropriate behavior and are seeking full-time employment in previously masculine-dominated occupations (Terborg, Peters, Ilgen & Smith, 1977). Even though legal and social support for women's new career interests may have increased in the last decade, females are attaining high levels of job success in disturbingly low numbers: "Women still represent a token incursion into the real power structure of most corporations" (Doudna, 1980).

A perusal of current labor statistics reveals that despite new job opportunities brought about by the advent of the women's liberation movement and the passage of federal legislation banning sex discrimination in employment, women tend to work in certain traditionally female areas and are largely excluded from occupations having high status or power (Robie, 1973; Lenney, 1977). For example, 97% of all nurses and 80% of all clerical workers are female, but only 3% of all engineers, 9% of all lawyers and judges, 19% of all physicians and dentists, and 23% of all managers and administrators are women (U.S. Bureau of Labor Statistics, 1979). Of even greater concern is the finding that, once on the job, women have little success in integrating themselves into positions of authority and responsibility (Terborg, Peters, Ilgen, & Smith, 1977).

"Women populate organizations, but they practically never run them . . ."
(Kanter, 1977, p. 16). A recent examination of the representation of women in forty-five government agencies showed that females held only 6.2% of the top level titles although they made up 50% of the work force (The New York Times, September 28, 1980, p. 39).

This job picture is particularly puzzling in light of the repeated findings that there are remarkably few differences between the sexes in most achievement-relevant characteristics: men and women are equal in overall measures of academic, intellectual, and creative ability (Maccoby & Jacklin, 1974). Women have also been reported as being similar to men in leadership capability (Day & Stodgill, 1972), problem-solving ability (Matthews, 1972), and cooperative and competitive behaviors (Lirtzman & Wahba, 1972). What, then is responsible for the limited career accomplishments of women?

One explanation for the low job status of females is that differential sex role socialization in childhood and adolescence has led to the acquisition, in women, of certain personality traits and/or behavior patterns which are contrary to the demands of success. For example, Hennig and Jardim (1977) argue that because women have not been encouraged to participate in team sports to the same extent as men, they fail to develop certain game skills which later lead to effective managerial performance. Specifically, women do not learn how to view risk as an opportunity for success as well as failure (p. 27), aim to win as a team rather than as an individual (p. 22), deal with criticism by seeing it as directed less to the person and more to task accomplishment

(p. 23), and accept loss by distancing it "you win some, you lose some" (p. 23).

There is evidence that women, as a group, describe themselves and are described by men as lacking presumed requisite managerial traits (O'Leary, 1974; Schein, 1973, 1975). There are also some laboratory studies which demonstrate that women may lack the aggressiveness, leadership ability, etc., often required of management positions (Bond & Vinacke, 1961; Megargee, 1969; Maier, 1970). However, there is conflicting information, primarily from field investigations, which suggests that women do possess the necessary qualifications for high-level jobs (Day & Stodgill, 1972; Lirtzman & Wahba, 1972; Miner, 1974; Morrison & Sebald, 1974). Females who reject sex-role stereotypes and choose a career over more traditional pursuits appear to have the same motives, skills and abilities as the men in their chosen occupations. Given the inconsistency of trait research results, it seems untenable to conclude that sex differences in personal attributes totally accounts for the limited career accomplishments of women (Terborg, Peters, Ilgen, & Smith, 1977).

An alternative explanation for the current situation of females is that certain factors in the work environment have limited a woman's options to utilize her full employment potential. While it is possible that women develop different dispositions and skills than men, external resistance to females in the job setting may prevail over these personality and training variables. For example, a bias against women has been shown to exist in:

- Selection choices (Cohen & Bunker, 1975; Dipboye, Fromkin and Wiback, 1975; Fidell, 1970; Shaw, 1972);
- Promotion decisions (Day & Stodgill, 1972; Rosen & Jerdee, 1974);
- Employee development (Rosen & Jerdee, 1974);
- Determination of salary level (Dipboye, Arvey & Terpstra, 1977; Levitin, Quinn & Staines, 1971; Terborg & Ilgen, 1975);
- Job entry opportunities (failing to recruit, offering lower starting salaries and rejecting applicants for nonjob related reasons) (Terborg & Ilgen, 1975).

Clearly, both overt and subtle sanctions against women who desire employment in male dominated careers could be a significant impediment to their job aspirations. However, several factors affecting the validity of sex discrimination arguments have yet to be resolved. A major criticism revolves around methodological issues. A bias toward women is often tested in laboratory situations in which "strangers interact with other strangers, or with paper and pencil stimulus others, for brief periods of time in contrived settings. Consequently, the manipulated variable of sex may be one of the few things the subject has with which to make a discrimination" (Terborg, 1977, p. 655). Research results from such studies are suspect in light of other findings that stereotypes have little impact on personnel decisions when there is adequate information on the candidate (Terborg & Ilgen, 1975).

In addition, in the few field research efforts carried out, investigators may be guilty of comparing what happens to a woman on the job to what would have happened to an "ideal" successful male (i.e., excellent training and development opportunities, good working

relationships with peers and supervisors, full utilization of skills etc.). Any discrepancies between the actual female experience and the male myth are labeled the result of sex discrimination (Harland & Weiss, 1980). Using realistic comparison others may change the nature of the results. In a recent study of male and female managers in two corporate settings, a major finding was that there were more similarities than differences between the sexes in regard to the career barriers they encountered (Harlan & Weiss, 1980).

In summary, there are two popular explanations for the limited career accomplishments of females, one which focuses on internal or psychological barriers and one which emphasizes external or situational impediments. Neither approach seems wholly satisfactory in accounting for the scarcity of women in prominent professional roles. According to a review by Riger and Galligan (1980), much of the inability to facilitate the upward mobility of women may stem from a failure to develop a new perspective on the problem of women's low job status by bridging the people and situation-centered explanations so prevalent in the literature. The present study was an attempt to more fully understand why women may not excel to the same extent as men in organizational settings through a contingency approach which examines the interaction between a personal characteristic of women (low self-confidence) and an aspect of the job environment in which women may work (the presence or absence of feedback).

Overview and Interpretation of Results

The crucial experimental questions concerned the relationship between sex, self-confidence, and various feedback conditions; specifically, how task confident are men and women when they receive no cues about their performance and how does this confidence change when they are provided with information on their task success or failure?

In the Absence of Feedback

As noted in the results section, Hypotheses 1 and 2 were both supported indicating that in the absence of feedback, women give lower estimations than men of their potential to excel on an unfamiliar task. Before they actually begin the task, and as they proceed through several trials of the task, they anticipate doing less well than do the males ($p < .002$). This a priori finding can now be added to an extensive list of post hoc research results which support the conclusion, that in the absence of feedback, low task self-confidence is consistently associated with the female sex (Maccoby & Jacklin, 1974, Ch. 4).

Of further interest in the no-feedback condition was the finding that both sexes decreased their self-confidence over time ($p < .04$), suggesting that nonreaction actually had active reinforcing properties. The adage "No news is good news" would appear to be fallacious in this situation and should be revised to read, "No news is bad news" for both males and females. This downward trend was not anticipated and has not been confirmed elsewhere, thus making it a potentially significant finding. It has previously been noted that children who are given

positive responses to an achievement effort in an experimental situation will interpret subsequent nonreaction to a similar effort as negative reinforcement (Crandall, 1963; Crandall, Good, & Crandall, 1964).

Possibly, because subjects anticipated doing quite well on the task based on their initial expectancies (the mean confidence score for males was 77.35; for females 58.25), nonreaction was actually interpreted as a failure to positively reinforce. However, whether the present finding is typical of all feedback-free situations which are not preceded by prior positive reinforcements or whether it is due to some peculiarity of the experimental design (e.g., the nature of the task) cannot be ascertained solely from this investigation.

In the Presence of Feedback

In the presence of both positive and negative feedback, the confidence levels of males and females were significantly different from those noted for subjects in the no-feedback condition ($p < .01$), thus indicating that the treatments were highly effective in raising and lowering subjects' expectations of success in the anticipated directions. Further, although the positive feedback was more favorable than the negative feedback was unfavorable (i.e., the two conditions were not objectively mirror images of each other), the negative condition caused greater decreases in the dependent variable than the positive feedback caused increases. Of course, since the task was one on which both sexes initially felt they had a better than average chance of succeeding, subjects in negative conditions had to make greater changes in their scores than subjects in positive conditions in order to be in line with

the experimental feedback levels. However, this still leaves the unanswered questions: Given that subjects expected to hear fairly positive news about their performance, why were both men and women willing to make such drastic reductions in their expectancies? Why was the negative feedback so persuasive?

The tendency for subjects to lower their aspirations appreciably following a series of negative reinforcements has been recorded elsewhere (Festinger, 1939; Sears, 1940; Rychlak & Eacker, 1962; Crandall, 1963; Crandall, Good, & Crandall, 1964), with the accompanying theorizing that such a practice is understandable because it limits a subject's chances for failure in the face of continuous negative feedback. That is, the more conservative the estimate on each subsequent trial, the more likely it is that the subject will be "successful" in relation to the information s/he receives. However, this explanation seems limited by empirical findings which show that positive feedback is accepted more than negative almost without exception (Ilgen, Fisher, & Taylor, 1979), suggesting that there is a natural reluctance on the part of most individuals to believe feedback which is detrimental to their self-image. Thus, subjects should avoid lowering their expectancies and implicitly labeling themselves as losers unless there was no way for them to deny the unfavorable reports. This line of reasoning leads to a more probable explanation for the effectiveness of negative feedback in this particular experiment.

The impact of the negative results on men and women's self-confidence could be attributed to the fact that they were presented by an expert

source. Other studies have demonstrated that messages which are in line with a subject's beliefs are accepted equally regardless of the status of the sender, while information which is discrepant from the individual's self-perception is influential only when it comes from a high status source (Aronson, Turner, & Carlsmith, 1963; Halperin, Synder, Shenkel, & Shouston, 1976). Since the experimental instructions emphasized the credibility of the study by saying that it was a joint endeavor on the part of several local prestigious universities including Harvard and MIT, and since the actual feedback was in the form of a computer read-out, it follows that subjects felt the information they received emanated from a reliable and expert source. Then, too, the students really had no opportunity to check the accuracy of their feedback with their peers since a "No talking" rule was enforced during the experiment. Thus, any suspicions about the veracity of the score could not be substantiated.

The most unexpected and significant finding in the present study was that female levels of self-confidence were never equal to those of men. This was in direct contradiction to Lenney's (1977) conclusion that male and female subjects who are provided with clear information on their task specific abilities will report equal levels of task confidence (p. 6). Results showed that females started and ended the task with estimates significantly lower than the males in all treatment groups ($p < .01$). However, the women did not seem to be any more or less sensitive than males to the various types of feedback. Both sexes raised their self-confidence an equivalent amount following positive feedback and lowered their self-confidence an equivalent amount following

negative and no feedback. This, too, is inconsistent with previous evidence which indicated that girls are more likely than boys to be influenced by external evaluations of their performance (Crandall, 1963).

Implications

That women express lower estimates of their capabilities than do men seems well established in this and other studies (cf. Maccoby & Jacklin, 1974, Ch. 4). There were significant sex differences in confidence levels in all experimental conditions, with women consistently exhibiting more pessimism than men about their chances for success. Thus, women may not only face the possibilities of sexual stereotyping and discrimination in their jobs (Rosen & Jerdee, 1974), but they must also work under the disadvantage of "feeling less capable." Given that one's expectancy of success has a motivational impact (Feather, 1963; Battle, 1965, 1966; Feather & Simon, 1973), the ability of women to advance in corporate settings the way men do may be severely hampered.

Of course, such concern will be deemed unwarranted by theorists who question the motivational qualities of task self-confidence. In their favor is the finding that female performance is often as good as or sometimes better than that of males despite the documented tendency of women to underestimate their task potential (Montanelli & Hill, 1969; Crandall, 1969). However, the studies cited in the literature review of this paper which demonstrate a relationship between measures of expectancy and subsequent effort, performance, willingness to conform, etc., would appear to lend convincing proof to a motivational

interpretation of self-confidence. Furthermore, similarities in performance between the sexes could be accounted for by a variety of alternative explanations.

One possibility is that the responses given by females do not represent subjectively held probabilities of success but, rather, are simply the kinds of modest statements which women have been socialized to give in response to cultural demands for sex-appropriate behavior. In other words, women may feel confident but think it unfeminine to "brag" and actually say so. This suggestion seems unlikely in light of the fact that judgments are usually made privately (on paper and pencil) and are seen only by the subject and, later, the experimenter. Since women are not reluctant to report favorable things about themselves on self-esteem questionnaires which tap general feelings of competence and worth (Maccoby & Jacklin, 1974, Ch. 4), it does not follow logically that they should be reticent to give positive estimations of their task self-confidence. Thus, it seems necessary to continue to entertain the possibility that the internally held performance expectations of the two sexes are actually different. A more probable explanation for performance equality is that there are other motivational factors which favor females (e.g., perceptions of internal control) and which mitigate the effects of low self-confidence. Then, too, there may be situational cues (e.g., the nature of the task) which act to raise women's task expectancies to higher levels (Lenney, 1977).

The role of feedback (or the lack thereof) in influencing an individual's confidence about future performance was also well-established

in this study. All feedback conditions conveyed to the recipients some information about their task potential (i.e., their effort to performance expectancies). The positive feedback was most effective in raising the confidence responses of men and women while negative and no-feedback treatments had a detrimental effect on subjects' estimations. These findings have important implications for applied settings.

It has been argued by many theorists for many years that the only tool needed for worker motivation is the presence or absence of positive reinforcement (Skinner, 1953; Whyte, 1972; Wiard, 1972; Beatty & Schneider, 1975). Thus, that positive feedback was effective in raising confidence levels in the present study was not a surprising discovery. However, that no-feedback had the ability to take on active (and undesirable) reinforcing properties was an unexpected finding. When organizations deprive their employees of specific job-related information, they may unknowingly inhibit worker performance since both men and women in this investigation responded to the lack of feedback by lowering their estimations of how well they anticipated doing.

In addition, the repercussions of such a practice are more severe for female workers. Although both sexes respond similarly to the absence of performance information, the women are "hurt" to a greater extent simply because their confidence levels are so low initially. The males may decrease their scores over time, but they still maintain a competitive optimistic edge over the females; in short, the rich don't get richer, but the poor do get poorer.

The effects recorded in the no-feedback treatment take on special significance when paired with results noted in an unpublished on-going

study of managers in two companies in the retail industry (Harlan & Weiss, 1980). In two-to-three hour taped interviews, both the supervisors and male co-workers of women reported that female employees received less feedback. The women themselves responded that their supervisors did not stress improving performance and 35% of the women (compared to 18% of the men) felt that their supervisor's comments were ineffective in assessing job performance. If these findings are at all representative of contemporary corporate America, then the job future of women may be in jeopardy. The situation would be one in which the highly confident males are the recipients of performance feedback while the females, high in self-doubts about job ability, are largely neglected by their superiors. In this case, the rich not only get richer, but the poor, in comparison, get much poorer.

Finally, turning attention to the negative feedback treatments, the data clearly demonstrated the power of unfavorable results to depress self-confidence scores of men and women. This is an important finding in light of the near omnipresence of punishment in organizational settings (Luthans & Kreitner, 1975). High status individuals are often in a position to deliver rather unfavorable news to subordinates via criticism, nagging, unsatisfactory performance appraisals, etc. Managers may fail to motivate workers to perform in a desired manner due to their lack of understanding of their ability to inhibit a worker's ambition. The person in authority may well be aware of the tentativeness of his/her assessments, while the recipient of the information may accept it as a more permanent indictment of his/her ability to fulfill the requirements

of the job. Indeed, high status individuals, whether they be corporate managers, teachers, etc., may face a special responsibility because of the potential impact of their feedback on employees (Halperin et al., 1976). As noted in the no-feedback condition, the women are penalized more than the men by negative information because of their initially low confidence levels.

In summary, there are two major implications to be drawn here. First, sex differences in task self-confidence may be greater than has been previously recognized. Whether through socialization or the cumulative effects of past discrimination which has prevented them from attaining important skills and experience, women seem to approach achievement situations with significantly less confidence than their male peers and the gap between the sexes does not disappear when males and females receive identical cues about their performance potential.

Second, the role of feedback is still an important one even though it does not equalize the performance expectations of men and women. A critical ingredient in any employee's development is the evaluation of behavior and performance by relevant others in the work unit (Terborg, 1977). From the data observed in this experiment, it can be argued, further, that this factor is more essential for women than it is for men. Compared to the females, the males exhibited a sense of potency about their prospects of succeeding. This optimism was especially dramatic in the absence of performance feedback. Males who received no feedback at all during the experiment had confidence levels as high as those of women who had received a strong positive signal that they were

doing well. Assuming that managers have only a limited amount of time and energy which can be devoted to the distribution of feedback, priority should be given to directing pertinent job information to female employees who deserve to be provided with an opportunity to foster the same kind of confidence which is displayed by males.

Limitations: Threats to Validity

There are two general criteria by which any experiment can be judged (Campbell & Stanley, 1963). The first, internal validity, is the sine qua non of research since it indicates whether or not the experimental manipulation was responsible for the dependent measures recorded. Threats to internal validity appear to have been largely controlled, in this study, through the randomization process used to select and assign subjects to various conditions and the randomization of treatments within each experimental group. Checks on plausible third variable interpretations for the observed relationships (e.g., age and nationality of subjects; order of presentation of exercises, etc.) indicated that such factors were distributed equally across appropriate cells. However, there may be some need for concern over the potential effects of testing; that is, the possibility that results might be due to the number of times particular responses are measured (Cook & Campbell, 1979).

Almost all studies in which perceptions of performance are collected employ the same general paradigm; subjects are asked to participate in a task and predict how well they will do initially and

on each subsequent trial. The assumption has always been that reported expectancies are simply unobtrusive records of an on-going cognitive process. Yet, Dweck and Gilliard (1975) have shown that the very act of asking subjects to state their performance projections may influence the estimates they give. These authors found that requiring fifth grade boys and girls (working under conditions of failure) to produce an expectancy statement before each trial resulted in significantly lower final expectancies than when a statement was requested only before the last trial. They contend that the greater number of statements (which were made orally) may have made the evaluativeness of the situation more salient and created more pressure for subjects to revise expectancies downward in the face of continued negative outcomes. Since the current research endeavor utilized a much older sample, fewer dependent responses (three versus four), and private rather than public expectancies, this researcher feels confident about her subjects' ability to accurately report phenomenon that otherwise would be difficult to access. However, some care should be exercised when interpreting the observed levels of confidence. The possibility exists, for both sexes, that the stated confidence scores may deviate from those which might have been obtained under a different schedule of statements.

The second criterion by which experiments should be evaluated concerns the issue of generalizability: To what degree can the obtained results be applied to other settings and populations? The answer to this question determines external validity. Since the present study used largely white university students in an artificial laboratory

environment, generalizing the findings to less educated or more mature individuals in actual work settings should be made with great caution. However, it would be noted that the males and females in this investigation deviated in two significant ways from the commonly used "college sophomore" subject. First, they were somewhat older, with an average age for all participants of 21.3. Second, both males and females would have been employed in industrial jobs related to their business major for two separate six-month periods. This work exposure could possibly have given them a more "real world" orientation than might be found in other campus samples. Of course, if the issues raised herein are to be genuinely transferrable across populations, then the study must be replicated with other groups in other settings.

Of course, in any laboratory research there are potential problems associated with the subjects' awareness that they are participants in a scientific project. Under some conditions, subjects may be motivated to respond in a way that they think is "useful" for the experimenter's aims and/or may give abnormal responses because of an apprehension about being evaluated (Fromkin & Streufert, 1976). Efforts were made to control these unwanted effects through a variety of means. By extensive pretesting of similar subjects in a different college, instructions and procedures were refined to be less transparent about the real purpose of the study. Because the experimenter can often be a prominent source of cues about desired outcomes (Rosenthal, 1966), standardized recorded procedures were used in all treatments to reduce the likelihood that experimenter expectancies might be communicated to any group. Also, in

line with recommendations by Orne (1962, 1969), all subjects were queried by an assistant, after each session, regarding their perceptions of what the researcher hoped to find, how other students might react in a similar situation, etc., to insure that there were no overt attempts to bias responses in a particular way. Although many subjects had individualized notions of "what was going on," there was no uniform or accurate sense of the nature of the investigation. Finally, attempts were made to lessen anxieties by continually emphasizing the creativity angle of the research (as a means to improving the case analysis skills of business students). At no time was there any reference to examining the subject's personal adequacy or any interest expressed in knowing individual responses. In fact, anonymity was guaranteed since each student could choose his/her own ID number.

In conclusion, it should be noted that this experiment was primarily concerned with response differences between the sexes. Thus, results and discussion emphasize male/female comparisons. Although this was necessary to illustrate the main research thrust, such conclusions fail to point out the importance of individual differences. Exceptions to the observed findings can always be made in specific cases. It would be wrong to attribute the findings of aggregate data to every man or woman.

Suggestions for Future Research

To document the validity and magnitude of the current finding, future research efforts concerning the relationship between feedback,

self-confidence, and sex should focus initially on replication of the present study under similar conditions. Then, any changes produced by subsequent manipulation of variables can be attributed, with confidence, to conditions varied by the experimenter.

Some possible permutations of the current investigation are suggested below:

1. Individual differences among subjects should be examined to see if personal characteristics, of and beyond the subject's sex (e.g., self-esteem, locus of control) have the ability to influence the pattern of results.
2. Different levels of positive and negative feedback should be compared to determine if variations in the strength of favorable or unfavorable information affect subjects' task self-confidence.
3. In contrast to the highly consistent feedback conditions used in this experiment, researchers should explore how contradictory feedback messages (i.e., some positive information, some negative information) are perceived by males and females.
4. Comparisons of various schedules of solicitations for self-confidence statements (cf. Dweck & Gilliard, 1975) should be made to determine if asking subjects how they intend to do creates a situational demand to respond in a given way.
5. Since many studies have indicated that a combination of goal setting and feedback is superior (in terms of increasing performance) to goal setting alone (Kim & Hamner, 1976; Becker, 1978), it would be valuable to test whether the addition of

goalsetting conditions to the present paradigm could equalize the expectancy levels of the sexes.

CHAPTER VI

SUMMARY

Overview of the Study

In recent years much research in achievement behavior has been conducted using a motivational model in which expectancy is a central term. However, little attention has been paid to the effort-to-performance (or self-confidence) component of the expectancy concept. The purpose of this study was to investigate the existence of sex differences in self-confidence and to examine the effect of feedback on the self-confidence statements of men and women. Hypotheses were generated concerning the impact of positive, negative, and no feedback on the confidence projections of men and women working in a laboratory setting on a creativity task.

A total of 176 subjects were utilized to test the experimental hypotheses. Six conditions were created which permitted direct comparisons between males and females working under the various feedback conditions. Demographic data pertaining to age, nationality, and task perception were collected for each participant. A check for differences among groups on any of these variables was conducted and results indicated that these factors were randomly distributed across experimental cells. Statistical tests also revealed that there were no significant differences in initial confidence scores of same sex subjects in the treatment groups. Finally, manipulation checks

revealed that the desired experimental conditions had been successfully achieved; that is, subjects receiving positive feedback had the highest confidence scores, subjects receiving negative feedback had the lowest scores, and subjects receiving no feedback had responses falling between those of the other two groups. Analyses of variance and planned comparisons were conducted to test the hypotheses.

The research findings are summarized as follows:

1. Before beginning an unfamiliar task, men have higher confidence than women about their potential to perform well.
2. Across a situation in which no performance feedback is supplied to the subject, men have greater confidence than women that they can excel on the task at hand.
3. Men, in the presence of both positive and negative feedback, give significantly higher confidence estimates than women in who have received the same performance cues.
4. Males and females do not respond differently from one another to either positive or negative feedback; that is, their response patterns across three experimental trials are markedly similar.

The implications from the current findings were twofold: first, sex differences in self-confidence may be greater than has been previously recognized; and, second, while feedback does have the ability to influence one's expectancy of success on a task, it does not appear to equalize the self-confidence levels of males and females.

The limitations inherent in the design and conduct of the study were reviewed in terms of threats to internal and external validity. Internal threats were largely avoided because of the randomization and standardization procedures utilized in the study. Threats to external validity were more numerous largely because of the nature of laboratory experimentation. Generalizability of any results is narrowly limited to similar populations exposed to similar conditions.

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