# EFFECTS OF MODELING ON FEMALE COMPETITION AGAINST MALES

by

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A Thesis Submitted to the Faculty of the

DEPARTMENT OF PSYCHOLOGY

In Partial Fulfillment of the Requirements
For the Degree of

MASTER OF ARTS

In the Graduate College

THE UNIVERSITY OF ARIZONA

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## ACKNOWLEDGMENTS

The author wishes to express appreciation to Dr. Glenn M. White, supervisor of this research, for his invaluable assistance and advice. Further thanks are due Drs. Ted L. Rosenthal and Spencer McWilliams whose suggestions aided in the preparation of this manuscript, and Mr. Paul Hanson and Ms. Irma Borbon who ably served as assistants in this research.

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ABSTRACT

The present study was designed to investigate some of the characteristics of female competitive behavior against males. One-fourth of the female subjects observed a female model win against a male competitor, one-fourth of the subjects observed a female model lose against a male, and one-fourth of the subjects observed a female compete against a male with no outcome information provided. The remaining subjects participated in a no model, control condition. Females observing a model win or lose against a male were found to emulate this behavior significantly more than those exposed to the no outcome model or no model. Females did compete differentially against male and female opponents.

# INTRODUCTION

Since the early McClelland, Atkinson, Clark and Lowell (1953) achievement motivation research, a general trend has emerged concerning sex differences in the "need to achieve." Females seem to respond differently than males in the same achievement-oriented situation. Veroff, Wilcox and Atkinson (1953) found that women give more achievement-related responses to pictures containing male characters, suggesting that females associate high achievement motivation with the culturally-defined male role. Females also do not show the expected increase in need achievement scores when exposed to achievement arousal conditions which stress intelligence and leadership ability. Also, French and Lesser (1963) reported that in order for achievement motivation to be manifest in performance, a woman must perceive achievement goals as acceptable within the female role.

Other researchers have investigated the relationships among academic performance, achievement attitudes and perception of social role. Lesser, Krawitz and Packard (1963) demonstrated that intellectually-achieving girls perceive intellectual achievement goals as a relevant part of their own female role while underachieving girls perceive such achievement as more relevant to the male role. Houts

and Entwisle (1968) concluded that when masculine competitive behavior is seen as appropriate to the female role, there is a relationship between achievement attitudes and school grades, but not otherwise.

It can be concluded from these studies that the determinants of achievement motivation are different for men and women. Typically, women who achieved intellectually accepted a masculine sex-role orientation toward achievement. One might thus expect sex differences in male-female competitive behavior. In fact, Horner (1968) found dramatic changes in performance between high school men and women in competitive problem-solving situations. Women consistently performed better alone than in competition with men. Horner related the achievement motive in women to an avoidance motive which she called the motive to avoid success (M-s). According to Horner, when a girl achieves intellectually, she anticipates negative consequences such as a loss of femininity, social rejection and loss of affection. Tangri (1969) demonstrated that senior level college women expressed M-s with greater frequency than did junior level girls while Weston and Mednick (1970) found that black women showed less M-s than white women. Cross and Detterbeck (1972) found that college women with a high degree of M-s had higher college board verbal scores than low M-s women, but lower grade point averages. The incidence of M-s was greater among juniors than among freshmen, and high M-s juniors had higher

"maladjustment" scores as assessed with the Rotter Incomplete Sentences Blank than low M-s juniors.

In studies of coalition formation using a parcheesi game, Amidjaja and Vinacke (1965) and Bond and Vinacke (1961) found large sex differences in patterns of play. Males displayed a pattern of cutthroat competition while females manifested a concern for fairness, equalization of outcome and a strong orientation toward interpersonal accommodation. Females were more concerned with getting along with the other players than with winning. Grant and Sermat (1969) reported that females were more influenced than males by the sex of their partner in a Prisoner's Dilemma (PD) game. Kahn, Hottes and Davis (1971) found that females did not maximize their winnings when playing against men in the PD game. Females were more likely to vary their game choices as a function of the sex and attractiveness of their opponent. These researchers concluded that males and females do not have differential motives to compete, but respond to different cues. Males play to win while females alter their behavior to fit changes in the interpersonal situation.

Observational learning could account for some sex differences in competitive behavior. Modeling and vicarious processes are fundamental means by which new modes of behavior are acquired and existing patterns are modified. Indeed, research conducted within the framework of social

learning theory (Bandura, 1965, 1969, and 1971; Bandura and Walters, 1963) has demonstrated that virtually all learning phenomena resulting from direct experience can occur on a vicarious basis through observation of other persons' behavior and the consequences of that behavior. Thus, for example, a female could acquire intricate female-role behavior patterns by observing the performances of appropriate models. Since much social learning results from exposure to behavioral modeling cues, it seems reasonable to expect that women learn to respond to men in competitive situations through prior exposure to female models engaged in similar activities. It also seems reasonable that existing response patterns could be modified through exposure to an appropriate model.

The present experiment was designed to study some of the characteristics of female competitive behavior against males. Female subjects all first performed a task alone and then entered one of four treatment conditions. One-fourth of the subjects observed a female model win against a male competitor, one-fourth of the subjects observed a female model lose against a male, and one-fourth of the subjects observed a female compete against a male with no outcome information provided. The remaining subjects participated in a no model, control condition. Following the treatment conditions, the subjects were asked to perform the task again, either alone or in competition with a male or female.

It was hypothesized that females who watched a female model win against a male opponent would emulate competitive (success-oriented) behavior to a significantly greater degree than females who were either not exposed to a model or were exposed to a model with no outcome information provided. Furthermore, it was hypothesized that female subjects whose model lost to a male opponent would show a performance decrement when placed in a similar situation. Finally, it was expected that female subjects would compete less against male opponents than female opponents, for example, their scores would be lower when competing against male opponents as compared to female opponents.

## METHOD

### Subjects and Experimenters

The subjects were 120 female college undergraduates from introductory psychology courses at The University of Arizona. A female graduate student served as the experimenter and a female undergraduate acted as the model for all subjects. Male and female graduate student confederates served as opponents.

### Apparatus

Located in a small cubicle, the apparatus consisted of a bar press device, a light to signal the subject to start pressing the bar, a buzzer to signal her to stop, and a counter to record the number of bar presses. An intercom was also located in the cubicle for communication with the experimenter. In some of the treatment conditions a second counter recorded the bar presses of the subject's (hypothetical) opponent. The opponent's score was actually controlled by the experimenter from a control room by an electrical apparatus that allowed the experimenter to simulate bar presses on the opponent's counter. Each "bar press" that was recorded on the counter produced an audible click. A timer located in the control room automatically limited each

trial to 30 seconds. Five Porteus mazes were used as an intertrial task. A questionnaire was also administered to the subjects at the conclusion of the experiment (see Appendix A).

## Procedure

Trial 1: Baseline

Each subject was brought to one of a series of cubicles by the experimenter. The experimenter said that she was studying motor performance and was interested in the average rates of finger tapping and maze drawing for male and female college students. The subject was then asked to read the following instructions:

> In front of you, you will notice a red bar mounted in a block of wood. The experimental task is to rest your preferred hand on the block of wood and press the bar with your middle finger. When the yellow light flashes, signaling you to start, press the bar as rapidly as you can. The counter on your right will record your performance. A buzzer will signal you to stop at the end of one-half minute.
>
> Press the switch on the right of the Talk-a-phone to indicate that you have understood the instructions. If you have any questions, you can communicate with me through the Talk-a-phone.

The experimenter entered the control room and answered any questions about the task through the intercom.

When the subject indicated that she was ready, the light flashed on and the subject began bar pressing. At the end of thirty seconds the buzzer sounded and the bar press automatically became inoperable.

Following the completion of the bar pressing task the experimenter led each subject to a second cubicle. The subject was instructed to complete as many mazes as possible in one-and-one-half minutes. Inter-trial task responses were not analyzed.

After the subject performed the maze drawing task she was led back to the first cubicle.

Trial 2: Treatment Conditions

One hundred and twenty subjects were assigned randomly to each of the twelve cells of a 3 x 4 factorial design in which the two independent variables were opponent (male, female, or none), and exposure to a model competing against a male (model wins against opponent, model loses, model competes with no outcome information, and no-model control).

In the No-model, No-opponent (NM,NO) condition the subject was told:

> Routinely subjects are asked to perform the finger tapping task again in competition with another person. However, you are a subject with a starred number so you will be performing the finger tapping task again by yourself. Please review the instructions and push the lever on the Talk-a-phone when you are ready to begin.

The subject reviewed the instructions and then performed the task.

In the No-model, Male Opponent (NM,MO) and No-model Female Opponent (NM,FO) conditions the instructions were:

> Now we would like you to perform the finger tapping task again in competition with another person. Your opponent will be competing against you on the same task in another cubicle. The counter marked "1" will record your responses and the counter marked "2" is hooked up to your opponent's bar press and will record her (or his) responses.

The subject was then briefly introduced to her opponent who was then seated in another cubicle. When the subject and opponent both indicated that they were ready to begin, the yellow light in the subject's cubicle flashed and she began bar pressing. Actually the opponent's score on the second counter was controlled by the experimenter and the opponent was a confederate.

In the three Modeling, No-opponent conditions--Model, No Outcome (MN), Model Wins (MW) and Model Loses (ML)--the subject was given the same instructions as in the No Model, No-opponent condition. However, just before the subject was to perform the task for the second time, the model (M) knocked, entered the cubicle and said:

> I'm sorry, I was scheduled for the experiment earlier and I'm late. I'm in a hurry to get to a class and I was wondering if I could be in the experiment now if it won't take too long.

The experimenter gave her permission, seated the subject in another chair in the cubicle and explained the task to the model. In all modeling conditions the model performed the task in competition with a male opponent.

In the Model, No Outcome conditions the opponent's counter was turned away from the subject who was given no

feedback as to whether the model won or lost. The subject and model were also instructed not to speak to each other while in the cubicle.

In the Model Wins conditions the model verbalized her desire to win against her opponent (for example, "I'm going to really try to beat this guy," "I'm winning," "Good I beat him"). In this condition the model actually beat her opponent by approximately 20 points. The confederate's score, which was always controlled by the experimenter from the control room, remained constant across all subjects.

In the Model Loses conditions the model made self-deprecating comments (for example, "I probably can't beat this guy," "I'm losing," "I didn't think I could win so I didn't try very hard"). The model actually lost by approximately 20 points.

The model was excused after she performed the task. The subject was then asked to perform the task by herself. She was reminded that she was not competing against another person.

In the Model, Male or Female Opponent conditions, the subject was told that she would be competing against another person. The model then entered the cubicle and performed the task as in the above conditions. Following the model's exit, the subject was introduced to her opponent and then performed the task in competition with that person.

In all conditions, after the subject performed the bar press task a second time she was asked to complete a rating scale. She rated her impression of the physical attractiveness of her opponent, how good she thought the subject ahead of her (the model) performed the finger tapping task and her attitude toward Women's Liberation on a five-point Likert scale (see Appendix A).

## RESULTS

The results of the experiment were evaluated with an Opponent X Modeling X Trials (3 X 4 X 2 split plot) analysis of variance. The dependent variable was the number of bar presses on the pre- or post-experimental trial. Comparisons between pairs of experimental groups were made with Tukey HSD tests, and comparisons among more than two experimental groups used the Scheffé method (Kirk, 1968).

The means for each condition appear in Table 1. The analysis of variance results appear in Table 2.

A trials effect obtained $F = 249.48$; $df = 1, 108$; $p < .0005$, with Trial 2 scores ($\bar{X} = 147.37$) surpassing Trial 1 scores ($\bar{X} = 126.64$).

Effects of M's competition outcome on Ss' response rate were found, $F = 3.96$; $df = 3, 108$; $p < .025$, with Ss exposed to MW responding most, followed by Ss exposed to ML, and Ss exposed to M,NO. Subjects in the NM control group had the lowest response rate. The NM and ML conditions differed significantly ($p < .01$) as did the comparisons of the NM with the MW conditions ($p < .01$) and the MN with the MW conditions ($p < .01$).

An effect was also found for the Trials X Modeling interaction, $F = 13.25$; $df = 3, 108$; $p < .0005$. There were

Table 1. Mean Scores for Frequency of Bar Presses on Trial 1 and Trial 2

| Opponent Condition | Modeling Condition: No Model I | No Model II | Model No Outcome I | Model No Outcome II | Model Wins I | Model Wins II | Model Loses I | Model Loses II | Combined |
|---|---|---|---|---|---|---|---|---|---|
| No Opponent | 118.30 | 133.50 | 123.70 | 140.00 | 130.90 | 149.70 | 143.70 | 151.30 | $\bar{X}_I$=129.50 $\bar{X}_{II}$=143.55 |
| Male Opponent | 115.80 | 133.60 | 116.90 | 144.70 | 134.70 | 167.60 | 135.60 | 139.30 | $\bar{X}_I$=125.75 $\bar{X}_{II}$=146.30 |
| Female Opponent | 124.30 | 143.60 | 126.00 | 148.20 | 120.70 | 168.20 | 129.10 | 149.00 | $\bar{X}_I$=125.02 $\bar{X}_{II}$=152.25 |
| Combined | $\bar{X}_I$= 119.47 | $\bar{X}_{II}$= 136.90 | $\bar{X}_I$= 122.20 | $\bar{X}_{II}$= 144.30 | $\bar{X}_I$= 128.77 | $\bar{X}_{II}$= 161.83 | $\bar{X}_I$= 136.13 | $\bar{X}_{II}$= 146.43 | |

Table 2. Summary of Analysis of Variance for Frequency of Bar Presses on Trial 1 and Trial 2

| Source | df | MS | F |
|---|---|---|---|
| Between subjects | 119 | 162.18 | |
| Opponent (A) | 2 | 3580.66 | .18 |
| Model (B) | 3 | 578.67 | 3.96** |
| A x B | 6 | 904.24 | .64 |
| Subjects within groups | 108 | | |
| Within subjects | 120 | | |
| Trials (C) | 1 | 25771.54 | 249.48*** |
| A x C | 2 | 822.86 | 7.97*** |
| B x C | 3 | 1368.62 | 13.25**** |
| A x B x C | 6 | 251.84 | 2.44* |
| C x subjects within groups | 108 | 103.30 | |

* $p < .05$

** $p < .025$

*** $p < .001$

**** $p < .0005$

significant baseline differences on Trial 1 with ML surpassing the two conditions NM and MN $ps < .01$. On Trial 2 significant differences were obtained, with MW surpassing NM, ML, and MN $ps < .01$. The change scores between Trial 1 and Trial 2 were significant within each of the NM; MN and MW conditions ($p < .05$). Trial 1 and 2 scores were not significantly different for the ML condition. In addition, the MW group ($\bar{X} = 33.07$) surpassed the ML group ($\bar{X} = 10.3$) with regard to Trial 1 and Trial 2 change scores ($p < .01$). Similarly, a comparison of the change scores of the MW group ($\bar{X} = 33.07$) with the NM group ($\bar{X} = 17.43$) was significant ($p < .01$), as was a comparison of the MN group ($\bar{X} = 22.1$) with the ML group ($\bar{X} = 10.3$) with regard to change scores ($p < .01$).

The Opponent main effect did not reach significance. However, the interaction of Trials X Opponent was significant $F = 7.97$; $df = 2, 108$; $p < .001$. There were no significant differences on either Trial 1 or Trial 2 among the opponent conditions. Comparisons of the FO Ss ($\bar{X} = 27.23$) with the NO Ss ($\bar{X} = 14.4$) with regard to change scores ($p < .01$), and of the MO group ($\bar{X} = 34.95$) with the NO group ($\bar{X} = 14.4$) changes ($p < .01$) disclosed significant differences. The change scores of the FO and MO Ss did not differ significantly.

A triple interaction of Trials X Modeling X Opponent obtained $F = 2.44$; $df = 6, 108$; $p < .05$. Baseline differences

were obtained on Trial 1 with both MW,NO and ML,NO surpassing NM,NO, and both MW,MO and ML,MO surpassing NM,MO ($p<.05$). With regard to change scores, a comparison of the MW,MO group ($\bar{X} = 32.90$) with the MW,FO group ($\bar{X} = 47.50$) yielded $p<.05$. Also a comparison of the ML,MO group ($\bar{X} = 3.70$) with the ML,FO group ($\bar{X} = 19.90$) yielded $p<.05$. The change scores for the respective NM and MN comparisons were not significant. A comparison of the MW,MO change score ($\bar{X} = 32.90$) with the ML,MO change score ($\bar{X} = 3.70$) was significant $p<.05$. Similarly, a comparison of the MW,FO change score ($\bar{X} = 47.50$) with the ML,FO change score ($\bar{X} = 19.9$) yielded $p<.05$.

An inspection of the scores on the rating scale showed no marked trends; therefore an analysis of covariance was not performed.

## DISCUSSION

Previous studies have shown that females respond differently than do males in the same achievement-oriented situations. Females seem to associate high achievement with the male role and often avoid success when it conflicts with traditional female role behaviors. Social game research has concluded that women perform better alone than in competition with men. Moreover, this research shows that women seem to respond to different cues in a competitive situation and appear more concerned with a male opponent's opinion of herself, social rejection and loss of femininity than with winning the game.

The present experiment demonstrated that modeling can significantly affect female competitive behavior. The prediction that observation of a female model competing and winning against a male opponent would elicit more female competitive behavior than in the NM condition was supported. Change scores of the MW group were significantly higher than the NM group. Also observation of a female model losing in competition with a male elicited significantly fewer bar presses than occurred in the MW and Model, No Outcome conditions. In spite of modeling condition baseline differences on Trial 1, an analysis of change scores showed that

Ss in the ML condition had lower scores than both the MW and Model, No Outcome conditions. Also Ss in the ML condition were the only Ss who did not score significantly higher on Trial 2 as compared to Trial 1.

With regard to the effect of an opponent on competitive performance, Ss with either a female opponent or male opponent had higher change scores than Ss with no opponent. However, sex differences in opponent did not significantly affect competitive performance across the modeling condition.

The present experiment provides some supporting evidence that females compete less against male opponents than female opponents in some modeling conditions. Differences in performance as a result of watching a model compete against a male or female opponent were evident. Subjects who watched a model win against a male opponent had lower scores than Ss who watched a model win against a female opponent. Similarly, Ss had lower scores in competition with females when they observed models who lost against males. Also Ss who watched a model lose against a male opponent had lower scores than Ss who watched a model win against a male opponent. And Ss who watched a model lose against a female opponent had lower performance scores than Ss who watched a model win against the same opponent. Some of the Ss' verbalizations were interesting in this regard. One S watching a model lose against a male said, "Boys are faster than girls. Big deal." One S commented to the

losing model, "Oh, you did fine; males are always faster." Another S in the same condition responded to the model, "It's a man. What did you expect? I bet a man could do a lot better."

In all other conditions Ss did not compete differentially against males and females. The presence of a model with outcome information provided was necessary to elicit differential competitive performance. It is possible that the behavior of the model (whether she won or lost) served as a discriminative stimulus for the S to win or lose against an opponent. Information emanating from the actions of the model may have conveyed information to the S about what she was to do in a similar situation.

Taken together, the present results do not support the conclusion that females necessarily take a compliant, noncompetitive role toward men. Certainly, the college women studied here did not compete any more or less vigorously when their opponents were men versus women. However, it is interesting that Ss imitated a winning model and improved their performance when competing against a male opponent. And although Ss did not actually have lower scores when competing against their male opponent, they did not have significantly higher scores on Trial 2 after watching a losing model. Therefore, to some degree, women did respond differently to their male opponent as a result of watching a model. It is possible that women learn it is

situationally acceptable or unacceptable for them to compete against males by watching other women's response to similar activity.

The present study may have failed to replicate the findings of previous studies because of several limitations: The experimental motor task used here was relatively simple. Conclusions drawn from previous research are based on competition in a problem-solving or intellectually related situation. Had the task been cognitive, such as solving anagrams, results of the experiment might have been more directly comparable to previous research. Also, Ss in the study did not compete face-to-face. Actually observing a male opponent during the process of competition could have made a S more concerned with possible negative consequences resulting from winning. However, the results of the present study might also differ from previous research simply because sex differences in regard to achievement and competition are declining. Recently, Lunneborg and Rosenwood (1972) concluded that sex-stereotypes relating to need affiliation and need achievement are changing in the college population. Men are becoming more concerned with interpersonal relationships, and women with pride in work and school.

Overall, the results seem to have several implications for socialization practices. The experiment demonstrated that through modeling a female can learn to change

her performance in a competitive situation. If competition is socially learned, exposure to females competing successfully against men may help change traditional female role behavior. The Women's Liberation Movement may provide such modeling effects. If a psychological barrier to female achievement exists, modeling may be a means to remove such a barrier.

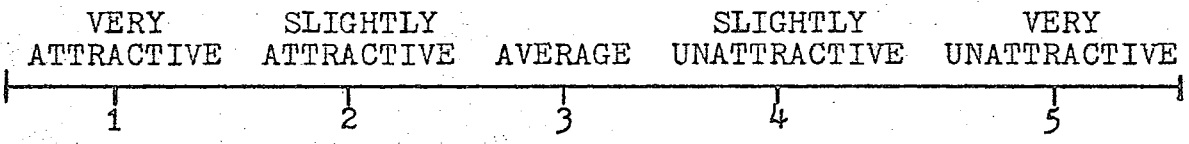
It is obvious that further research is needed to elucidate parameters of male-female competition. It seems clear that a pattern of women losing against men is tied to particular situations and is a phenomenon subject to multiple causation. Several factors which may be investigated in the future are such parameters as type of situation, task involved, and attractiveness of opponent. Differences in competitive performance among different male and female age, occupational, educational, and socioethnic groups might be profitably investigated.

APPENDIX A

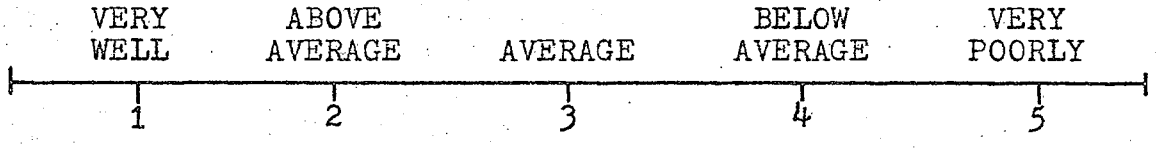
RATING SCALE

Now we would like you to complete the three rating scales below. Indicate your preference on each scale by circling the appropriate number.

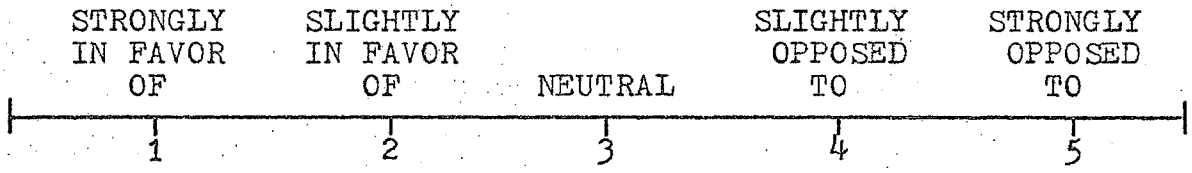
I. Rate your impression of the physical attractiveness of your opponent.




II. Rate how good you thought the subject ahead of you performed the finger tapping test.




III. Rate your attitude toward Women's Liberation.



## REFERENCES


Amidjaja, I. R., and Vinacke, W. E. Achievement, nurturance, and competition in male and female triads. Journal of Personality and Social Psychology, 1965, 2, 447-451.

Bandura, A. Vicarious processes: A case of no-trial learning. In L. Berkowitz (Ed.), Advances in experimental social psychology. Vol. II, New York: Academic Press, 1965, 1-55.

Bandura, A. Principles of behavior modification. New York: Holt, Rinehart, and Winston, 1969.

Bandura, A. Social learning theory. New York: General Learning Press, 1971.

Bandura, A., and Walters, R. H. Social learning and personality development. New York: Holt, Rinehart and Winston, 1963.

Bond, J. R., and Vinacke, W. E. Coalitions in mixed-sex triads. Sociometry, 1961, 24, 61-71.

Cross, H. J., and Detterbeck, J. A. Adjustment and achievement as a function of the motive to avoid success in college women. Paper presented at the meeting of the Western Psychological Association, Portland, April 1972.

French, E. G., and Lesser, G. S. Some characteristics of the achievement motive in women. Journal of Abnormal and Social Psychology, 1963, 66, 59-66.

Grant, M. J., and Sermat, V. Status and sex of other as determinants of behavior in a mixed-motive game. Journal of Personality and Social Psychology, 1969, 12, 151-157.

Horner, M. S. Sex differences in achievement motivation and performance in competitive and non-competitive situations. Unpublished doctoral dissertation, University of Michigan, 1968.

Houts, P. S., and Entwisle, D. R. Academic achievement effort among females: Achievement attitudes and sex-role orientation. Journal of Counseling Psychology, 1968, 15, 284-286.

Kahn, A., Hottes, J., and Davis, L. Cooperation and optimal responding in the prisoner's dilemma game: Effects of sex and physical attractiveness. Journal of Personality and Social Psychology, 1971, 17, 267-279.

Kirk, R. Experimental design: procedures for the behavioral sciences. Belmont, California: Brooks-Cole, 1968.

Lesser, G. S., Krawitz, R. N., and Packard, R. Experimental arousal of achievement motivation in adolescent girls. Journal of Abnormal and Social Psychology, 1963, 66, 59-66.

Lunneborg, P. W., and Rosenwood, L. M. Need affiliation and achievement: Declining sex differences. Psychological Reports, 1972, 31, 795-798.

McClelland, D. C., Atkinson, J. W., Clark, R. A., and Lowell, E. L. The achievement motive. New York: Appleton-Century-Crofts, 1953.

Tangri, S. S. Role-innovation in occupational choice among college women. Unpublished doctoral dissertation. University of Michigan, 1969.

Veroff, J., Wilcox, S., and Atkinson, J. W. The achievement motive in high school and college women. Journal of Abnormal and Social Psychology, 1953, 48, 109-119.

Weston, P. J., and Mednick, M. T. Race, social class and the motive to avoid success in women. Journal of Cross-Cultural Psychology, 1970, 1, 284-291.