Competition Between Females and Males at Different Age Levels on Perceptual Motor Performance.

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A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
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in partial fulfillment of the
requirements for the degree of
Doctor of Education

in

The Department of Health, Physical, and
Recreation Education

by

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ABSTRACT

The purpose of this study was to compare perceptual-motor performance of females and males at different age levels when competing with members of the same sex and members of the opposite sex. A card sorting task was employed as the parameter to determine the effects of the two treatment conditions. The task consisted of sorting color-coded cards into a color-coded compartmentalized box for a thirty-second period. Two individual practice trials were administered prior to actual competition thus allowing for initial learning of the task. Utilizing a counterbalanced testing order, each subject performed under two treatment conditions: (1) competition against an opponent of the same sex and (2) competition against an opponent of the opposite sex. Two examiners conducted each testing session, one female and one male.

Subjects for this investigation were 240 students enrolled in Lafayette, Louisiana schools. Thirty white, right-handed female and thirty white, right-handed male volunteers were selected from each of four age groups: (1) eight year olds; (2) twelve year olds; (3) sixteen year olds and (4) twenty year olds.

The collected data were subjected to a split-plot factorial analysis of variance. The main plots consisted of the four age groups and the two gender groups while the
split-plot consisted of the two treatment effects.

Statistical analysis revealed that:

1. On the card sorting task, performances of females when competing with the same sex and/or competing against the opposite sex were significantly superior to males performing under the same conditions.

2. No significant difference was found in the comparison of female and male performances when competing with members of the same sex and members of the opposite sex.

3. The superiority of the females on the perceptual-motor task was greater under competition against the opposite sex than in competition with opponents of the same sex.

4. Male subjects performed approximately the same in cross-sex and same-sex pairing competition.

5. Regardless of the experimental condition a significant linear improvement in performance with age was found.

Based on the results obtained in this study, the following conclusions appear to be warranted:

1. In the task utilized in this study, females out performed males regardless of age or competitive situation.

2. Perceptual-motor performance improved with increased age.

3. Overall, competition with the opposite sex was not different from competition with the same sex. However, there was evidence that competition with the opposite sex
enhanced the performance of the females.
CHAPTER I

INTRODUCTION

Physical educators and athletic administrators have recently been faced with the multifaceted problem of complying with legislation designed to equalize opportunities for female participation in competitive athletics. The traditional sex discrimination that has existed is largely based on myths and cultural role expectations. Theoretically, nearly all persons would agree that it is indefensible to deny an individual the opportunity for participation and optimal achievement in sports competition on the basis of sex.

Traditionally, females and males have had different role expectations which in some cases have resulted in discrimination. Such stereotyping of roles is evident from an early age. In research of child raising patterns, Bem and Bem revealed that "parents begin to raise their children in accord with popular stereotypes from the very beginning."¹ Supportive research has disclosed that as early as thirteen months of age babies who were barricaded from their mothers reacted differently according to their

sex. Male toddlers tried physically to get around the barriers while females stood in the middle of the room and cried.²

Such early perceptions of appropriate behavior patterns inevitably influence the lives of all individuals and may contribute to the limiting of the full development of human potential. Scott stated:

In today's society, one should be prepared to behave aggressively, at times, to survive. To have friends, at times one should be prepared to behave in a gentle way. Unfortunately, people are usually atrophied into one extreme or the other. Men know how to be very aggressive and tough, and they often are. Women, on the other hand, usually have been socialized into passivity, and they have that down very well.³

Stereotypically feminine behavior patterns have long been the least desirable behavior pattern in society. Ulrich noted that "the female is typically characterized as dependent, passive, fragile, nonaggressive, noncompetitive, yielding, receptive, supportive, and emotionally pliable."⁴ In direct contrast, males are depicted as "independent, aggressive, competitive, assertive, strong, enduring, courageous, active, disciplined, and emotionally controlled.⁵

⁴Celeste Ulrich, "She Can Play As Good As Any Boy," Phi Delta Kappan, LV (October 1973), 113.
⁵Ibid.
Broverman and others explored the subjective opinions of college students and clinicians concerning the traits of females and males. The Sex Role Stereotype Questionnaire consisting of 122 bipolar items was administered to actively functioning clinicians and college students. The clinicians included psychiatrists, clinically trained psychologists and social workers. There were three sets of instructions which called for the subjects to describe a healthy, mature, socially competent: (1) adult, sex unspecified; (2) a man and (3) a woman. They concluded that clinical judgments about the characteristics of healthy individuals differed as a function of sex of the person judged, and furthermore, that these differences in clinical judgments paralleled stereotypic sex-role differences. It was also found that behaviors and characteristics judged healthy for an adult, sex unspecified, which were presumed to reflect an ideal standard of health, resembled behaviors judged healthy for men, but differed from behaviors judged healthy for women. In general, females were considered "not at all competitive" and males were thought to be "very competitive." It was concluded that stereotypically masculine traits are more often perceived as socially desirable than are attributes which are stereotypically feminine.

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Cultural change, and its attendant alteration of attitude and behavior is a slow but penetrating force. New social movements have had an impact on behavior patterns and perhaps have already suggested new orthodoxies of sex roles. Crase\textsuperscript{7} suggested that such cultural alterations point toward a valuing of cooperation rather than competition in our society.

According to Lewis,

It is probably no accident that the new social movements combine a partial rejection of masculine ideals like intense competitiveness or clearly defined sex-related roles with an intensification of touching and feeling interactions, and that these new movements all have a communal rather than individualistic flavor. Knowing this, people interested in feeling and in group interaction must move toward an embrace of the feminine ideal—the feminization rather than the masculinization of our society.\textsuperscript{8}

Technology, coupled with such social structure change, has also contributed to an alteration in cultural perspectives. The mother/homemaker role has been rendered much less appealing. New attitudes, interests and incentives are taking place in society. Profound changes regarding the role of women in American culture include: (1) greater economic independence; (2) greater equality among the sexes; (3) stronger emphasis on success and achievement; (4) an expanded view of the female role, with wider choice of culturally accepted behavior models; and

\textsuperscript{7}Dixie R. Crase, "Significance of Masculinity and Femininity," \textit{Health Education}, VI (January-February 1975), 34.

\textsuperscript{8}Lewis, p. 57.
(5) greater educational opportunities and attainment.  

Other viewpoints have attributed these changes to the more humanistic attitude of Americans today. Oltman suggested that this evolvement probably occurred as a result of the increasing awareness of the costs of environmental pollution, racial discrimination and war. Such factors have brought about an increasing movement to strike down all barriers to human potential and expression. Historically, awareness of sexual barriers follows awareness of racial ones.

Such a humanistic attitude has been reflected in recent events involving the antiwar movement, students' rights, women's rights, Watergate, challenges of authority, accountability and relevance. Indeed, the rigid acceptance and adherence to tradition has lost its appeal in many areas of human behavior.

Stereotyped roles for females and males in the physical domain of athletic competition probably were rooted in the early need for physical strength for survival. The physical demands of hunting, traveling and protecting the family favored the larger and stronger male. Moreover, childbearing and nursing responsibilities greatly

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11 Ibid.
limited the freedom of the female. Generation after generation has perpetuated the concept of greater freedom for the male as has been demonstrated in legal, social and educational structures.

Physical educators have explored various social and psychological aspects of performance. Undoubtedly, individuals rarely perform without experiencing some effect of their social environment and such performance is evaluated by the individual by comparing herself or himself to others of her or his age and level of experience.\(^\text{12}\)

Martens suggested that, "The complex social processes occurring between individuals, individuals and groups and between groups themselves form much of the substance of physical activity."\(^\text{13}\)

It would follow that as one's social environment changes, i.e. new attitudes, changing concepts of masculinity and femininity, new avenues of interaction and expression, one could expect changes in performance.

An important social variable in physical performance is that of competition. While competition seems to be an influential and coveted aspect of the American social structure, particularly in relationship to perceptual-motor performance and learning, there are many aspects of


competition unexplored experimentally. 14

The vast majority of literature relating to competition has centered around male performance. Demonstrative of past opinions concerning such performance is Atkinson's reference to athletic competition as a "fairly universal achievement training experience for all males in this society." 15

Very little research has examined the perceptual-motor performances of females and males as a result of same-sex and cross-sex competition. Investigations have focused on same-sex competition comparisons. Researchers have repeatedly concluded that males become increasingly competitive, aggressive and independent with age whereas females, regardless of age, are more accommodative, passive and dependent. It is generally agreed that these behaviors are learned social conventions.

As females heed the stereotyped role expectations of parents, educators and society in general, they cannot display behavior conducive to responsibility and independence. A conflict arises between what is valued in society and what is expected of them behaviorally. At a time when civilization is dependent upon the fullest development of human potential, the world can ill afford suppression of approximately fifty-two percent of the population.


On the other hand, continued male imprinting of aggressiveness and tough-minded competitiveness may cause increasing levels of stress and anxiety. This would also contribute to the limitation of innate potential.

Cultural change evidenced today may change the feigned inferiority of the female in many matters. This might take the form of greater competitive behavior, assertiveness and independence. Conversely, males may also devalue stereotyped sex role expectations and emerge liberated from traditional behavioral patterns.

Females and males competing at the same task is in evidence today. Some formerly all male varsity sports teams are beginning to include female performers. Frequently females are part of golf teams and tennis teams. At the professional sports level mixed teams in volleyball have become a newly structured sport. Women competing against men on an equal basis is a new cultural experience, a product of the times.

If indeed there is cultural change evident today with respect to the sexes then it is essential that more information be provided concerning the nature of the differences and under what conditions they exist.

PURPOSE OF THE STUDY

The purpose of this study was to compare perceptual-motor performances of females and males at different age levels when competing with members of the same sex and
members of the opposite sex. It was also the purpose of this study to determine whether competitive performance between the sexes is modified by age.

NEED FOR THE STUDY

Competition between and among females and males is a timely topic, a new problem for many physical educators, coaches and athletic directors. As the role of women in our society is changed, so is their place in sports competition changed.

Several elements of society have contributed to the necessity of studying variables related to the competitive behavior of females and males. Among these are: The Higher Education Act and the Equal Rights Amendment; the expansion of women's roles; and the increased attention of the media and others towards women's athletics.\(^\text{16}\)

Aldrich\(^\text{17}\) revealed that little research has been done regarding females in competition when such activity has been increasing rapidly in our present day culture. The author pointed out the need for administrators and others to be informed concerning the development and direction of female competition.


Traditional sex role prescriptions have served to influence choice of sports activities and intensity of athletic performance in the past.\textsuperscript{18} Such cultural expectations have contributed to the delimitation of female and male behavior. Variables of a sociopsychological nature which affect perceptual-motor performance differences have largely been only alluded to in the literature.

The lack of research concerning competitive performance of females and males engaged in the same task is evidence of the culturally imposed direction physical educators have taken. Such performances have been considered independent of one another. In a changing culture this is no longer feasible.

Ulrich has pointed out the need for educators to endorse procedures in which people are treated as individuals. She stated that there are "many differences among people; they are more individual than stereotypical."\textsuperscript{19}

In a changing culture there is a need for more information regarding the effects of sociopsychological variables upon perceptual-motor performance relative to


\textsuperscript{19}Ulrich, p. 117.
There is a need to obtain more knowledge concerning the environmental factors involved in obtaining culture-free skilled performances. A major goal of the physical educator is to obtain optimal student performance and learning.

This study attempted to extend the present knowledge concerning the competitive performance of females and males when competing with the same sex or the opposite sex. It was hoped that the findings of such a study might aid physical educators, coaches, and athletic directors in establishing programs and experiences conducive to maximum performance for each student.

DEFINITION OF TERMS

The following terms were considered pertinent to this investigation:

Coaction. Coaction was defined as the behavioral effects caused by individuals in the same activity.

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23 Martens, p. 17.

Cross-sex competition. Cross-sex competition was operationally defined as task performance in the perceptual-motor task between subjects of the opposite sex.

Perceptual-motor task. Perceptual-motor task was defined as movement task whereby an individual must operate in the elements of space-time-force. Operationally, the perceptual-motor task was a card sorting task.

Performance score. Performance score was defined as a composite score reflecting performance on a prescribed card sorting task. Each subject had a performance score for each experimental condition.

Same-sex competition. Same-sex competition was operationally defined as the performance in the card sorting perceptual-motor task between two subjects of the same sex.

DELIMITATIONS OF THE STUDY

This study was delimited to 240 white, right-handed students enrolled in schools in Lafayette, Louisiana.

Selection of subjects was restricted to the ages: 8, 12, 16, and 20 years. The number of subjects were limited to thirty females and thirty males for each age.

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category. Performance was restricted to one perceptual-motor task, a thirty-second card sorting task.

LIMITATIONS OF THE STUDY

In this study, no attempt was made to control the selection of subjects as to (1) previous card sorting experience, or (2) personality trait component of aggression or competitiveness. All subjects had an acquaintance with the general nature of the task yet none revealed extensive experience.

Although an effort was made to select a non-sexist perceptual-motor task, the task may have had differential appeal for individuals. In addition, subjects were not screened as to previous acquaintances with each other. This may or may not have been a motivational factor.
CHAPTER II

REVIEW OF THE RELATED LITERATURE

The review of the literature was divided into two main sections: (1) literature in psychology and social psychology related to sex differences in competitive behavior and (2) studies in physical education related to sex differences in competitive behavior.

LITERATURE IN PSYCHOLOGY AND SOCIAL PSYCHOLOGY RELATED TO SEX DIFFERENCES IN COMPETITIVE BEHAVIOR

The majority of studies which dealt with competitiveness and noncompetitiveness in young children under the age of nine failed to reveal any significant differences in competitive and noncompetitive performance. Subject populations varied from seventy-two to twelve and common in all were game situation treatments. 26, 27, 28, 29


Two studies with young children serving as subjects did, however, report significant sex differences. Spiro observed children of one to five years of age in an Israeli kibbutz and reported that "in all [age] groups girls are more integrative (give, aid, share, act affectionate, cooperate) than boys, and boys are more disintegrative."

In investigating the competitive behavior of preschoolers from varying socio-economic backgrounds, McKee and Leader tested pairs of nursery school children on a toy construction block game. The researchers revealed that middle- and lower-class pairs of nursery school boys were more competitive than pairs of female peers.

Utilizing a competitive board game, Vinacke and Gullickson studied sex and age differences in the behavior of same-sex triads. The age groups were 7-8, 12-14, and college students. The investigators found that females, regardless of age, were not directly competitive but rather were accommodating in their behavior. It was further concluded that males became competitively exploitative with age. This linear trend was explained as a learned phenomenon.

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In evaluating study results using adult subjects where sex differences were obtained along with other significant variables, Vinacke pointed out that these differences were best described as exploitative versus accommodative rather than simply competitive versus cooperative. In all, the investigator found accommodation more typical of females and exploitation more typical of males.33

Due to the complexity of human behavior, the integration of general cultural sex-role stereotypes cannot be overlooked in such a review. It has been pointed out that such stereotyping may influence investigatory results as well as be used to guide and evaluate behavior patterns.34 For example, Piaget rather chauvinistically asserted:

The most superficial observation is sufficient to show that in the main the legal sense is far less developed in little girls than in boys. We did not succeed in finding a single collective game played by girls in which there were as many rules and above all, as fine and consistent organization and codification of these rules as in the game of marbles.35

Rosenkrantz, Vogel Bee, Bröverman and Broverman36


34 Harold Cook and Sandra Stingle, "Cooperative Behavior in Children," Psychological Bulletin, LXXXI (December, 1974), 924.


explored the extent to which sex-role stereotypes, with their associated social values, influence the self-concepts of men and women. A Stereotype questionnaire was administered to seventy-four college males, 18-25 years of age, and eighty college females, age 17-25. It was concluded that sex-role stereotypes continue to be clearly defined for the sexes and those associated with masculinity are more socially desirable than those associated with femininity. It was further concluded that females hold negative values of their worth relative to males.

In a study conducted by Barry, Bacon, and Child, it was found that the imprinting of sex-role stereotyped behavior was evident early in childhood. The researchers concluded that males were encouraged to be aggressive, competitive, and independent, whereas girls were rewarded for being passive and dependent.37

Society's assumption that males possess more desirable and positive traits than females has been repeatedly demonstrated in the literature. In an early study conducted by Smith, a series of questions were posed to 100 boys and 100 girls between the ages of eight and fifteen as to which sex possessed the most socially desirable traits and the most socially undesirable traits. It was concluded that as boys and girls got older they

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both held higher opinions of males and lower opinions of females.\textsuperscript{38}

As a result of the aforementioned developmental pattern, Prather suggested that girls learn to value themselves far less than they value boys as they mature. The researcher concluded that females in our society from the crib are socialized to be more oriented toward people, to be other-directed and dependent, whereas males are reared to be more independent, aggressive (competitive), and achievement-oriented. Girls learn to equate success at a given task with the demonstration of masculine traits, something most females are reluctant to do.\textsuperscript{39}

These attitudes, Bardwick suggested are directly related to the behaviors females demonstrate. The writer asserted that the value one placed on self determined the level of self-esteem that person held. It was also pointed out that because females held lower self-esteem profiles than their male counterparts then females may be hesitant to engage in behaviors requiring the highly valued male sex-role appropriate traits. This, the author asserted, would affect the achievement-directed behavior

\textsuperscript{38}Stevenson Smith, "Age and Sex Differences in Children's Opinions Concerning Sex Differences," \textit{Journal of Genetic Psychology}, LIV (1939), 17-25.

Horner attributed such female performance behaviors to a "motive to avoid success" which was defined as "the fear that success in competitive situations will lead to negative consequences such as unpopularity and loss of femininity."\(^4\) In a follow-up study Horner measured the motive to avoid success. The performances of college women were compared in competitive and noncompetitive situations. Classifications of high and low scores in the motive to avoid success were obtained for each subject. The investigator found that subjects high in the motive to avoid success performed less well in a mixed-sex competitive situation than in a noncompetitive situation. The reverse was true for subjects low in the motive to avoid success.\(^5\)

Based on Horner's findings, O'Leary concluded that women would respond negatively to success in a traditionally masculine context (competition) and that "such success is linked with fear of social rejection and doubts about one's femininity and normality.\(^6\)

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In a study conducted by Walberg, 705 girls and 1,369 boys enrolled in high school physics classes were given fifty-eight cognitive, attitudinal, and behavioral measures. The results revealed some major differences in the sexes as girls scored significantly higher on verbal aptitude, social values and interpersonal needs and displayed cautiousness especially about science experiences, and aesthetic (rather than theoretical) valuations. The investigator concluded that such differences may lead to greater academic success in high school but appear to penalize women for later eminence in scientific careers.\(^{44}\)

In studying the achievement motivation levels in females, Hoffman indicated that females who received or even anticipated negative feedback from achievement-directed behavior would often reduce their achievement strivings. It was also concluded that females have greater affiliative needs than do males and because of this may encounter a conflict between affiliation and achievement more frequently than males.\(^{45}\)

Lutzker studied the relationship between sex-role and competitive performance and failed to find significant differences between the performances of college males and


college females. Utilizing a game which permitted both cooperation and competition, twenty cross-sex pairs of subjects with a control group of ten pairs of male subjects were tested. It was the conclusion of the investigator that sex-role did not influence competitive behavior.\(^46\)

Sutton-Smith, Rosenberg and Morgan tested a much larger subject population, 1,901 boys and girls, of a younger age group than Lutzker's. Testing involved the administration of a play activities scale which discriminated between masculinity and femininity. It was evident that boys demonstrated a clear sex-role prescription but for girls there was sex-role confusion. It was concluded that competitive play and game activities were essential in the sex-role development of boys from the third to the sixth grades but of far less importance for the sex-role development of girls.\(^47\)

Summary of Studies in Psychology and Social Psychology Related to Sex Differences in Competitive Behavior

The studies reviewed reported some differences in competitive behavior of females and males at several age levels. Reasons for these differences were hypothesized. Experimental conditions included various game situations allowing for cooperation and/or competition, subjective


rating scales, case histories, and questionnaires.

Conflicting results were found in six studies involving young children in competitive situations. Four agreed that there were no significant differences between girls and boys in competitiveness while two studies reported boys were more competitive than their female peers. The majority of studies dealing with various age groups from school pupils to adults agreed that males were more competitive than females. Perhaps the diversity of findings might be at least partially attributed to the difficulty in testing very young children.

Many studies were reviewed that pertained to the influence of sex-role prescription to predictable behavior patterns with regard to competitiveness. With the exception of one study a link between sex-role behavior and competitiveness was drawn with males demonstrating competitiveness and females noncompetitiveness.

A number of studies concerning achievement behavior in females drew a parallel between the females consistent low self esteem profiles and their lack of excellence in achievement. The studies indicated that low achievement behavior for females resulted most frequently from the belief by both males and females that males possess more worthy and desirable abilities and traits than do females.
STUDIES IN PHYSICAL EDUCATION RELATED TO SEX DIFFERENCES IN COMPETITIVE BEHAVIOR

Freischlag investigated the effect of sex, competition and ability on a perceptual-motor task. Sixty male and female college students competed alone, with opposite sex opponents and same-sex opponents on a rotary pursuit task. Following pretesting, subjects were placed in ability groupings for pairing under subsequent treatment conditions. Monetary rewards were offered for the highest individual performance score achieved in each group. Results of the study indicated that ability levels were not significantly different between the sexes, and competition had a significant, positive effect on performance. Male subjects scored higher than female subjects. Females performed best under cross-sex competition. These scores were higher than those of males under both cross-sex and no opponent competition. Males were found to perform best when competing with a male opponent. The researcher concluded that such findings lend support to the practice of bisexual grouping in sport and physical education.48

Roberts conducted a study which investigated the effects of achievement motivation and competitive environment of the risk taking choice of males performing a perceptual-motor task. Grouping into "achieve-success" or

"avoid-failure" categories was determined following the administration of the French Test of Insight and the Test Anxiety Questionnaire. Fifty males in each category practiced a modified shuffleboard task from which empirical probabilities of success were found for each subject. Subjects performed under one of five treatment conditions: (1) alone; (2) presence of others; (3) interpersonal competition; (4) intergroup competition; or (5) interpersonal and intergroup competition. Subjects received twenty free choice trials in the performance phase of the study. The results of the investigation confirmed the risk taking theory in that "achieve-success" subjects preferred intermediate risk choices while "avoid-failure" subjects consistently preferred more extreme risk choices. No competitive treatment effects were found. The researcher concluded that in order for risk taking to occur in performing perceptual-motor tasks, the presence of others or the creation of a competitive climate whether in individual or team competition is not necessary. 49

Summary of Studies in Physical Education Related to Sex Differences in Competitive Behavior

Few studies in physical education literature were found that dealt with female-male competition. Two studies did reveal significant competition effects. Treatment

conditions included a rotary pursuit task and a modified shuffleboard task. The studies revealed that competition produced improvement in performance.

Female-male pairing was an integral part of one study which found that female performance was best when competing against males. Male performance was superior to female performance and males obtained their best scores when competing with males.

The element of risk-taking in performance was presented in one study. It was suggested that risk-taking occurs regularly in performance but competitive situations were not necessary to produce it.
CHAPTER III

PROCEDURE OF THE STUDY

OVERVIEW

The study was conducted during the fall of 1974 at the Montgomery Elementary School, Hamilton Elementary School, Lafayette High School and the University of Southwestern Louisiana in Lafayette, Louisiana.

Two hundred forty students were tested including thirty white, right-handed females and thirty white, right-handed males from each of four age groups: eight years of age; twelve years of age; sixteen years of age; and twenty years of age. A card sorting task was employed.

Each subject performed the thirty-second card sorting task under each of the following experimental testing conditions: (1) in competition with a subject of the same sex and (2) in competition with a subject of the opposite sex. Two examiners conducted each testing session, one female and one male, in order to counterbalance the sex of the experimenter as a factor of coaction. There were no spectators present. The order of performing under the experimental conditions was counterbalanced to thwart a learning effect.

The total number of correctly slotted cards for each thirty-second testing constituted each subject's
performance score. Subjects' scores under each experimental condition were recorded. The statistical design was a 4 x 2 x 2 split-plot factorial analysis of variance with the age groups and the two sexes assigned to the main plots and the two treatment effects assigned as a split-plot.

SELECTION AND SCHEDULING OF SUBJECTS

Montgomery Elementary School, Hamilton Elementary School, Lafayette High School and the University of Southwestern Louisiana were chosen because they were conveniently located, had a large percentage of white students, and the administrators were willing to allow participation in the study.

Eight, twelve, sixteen and twenty years were selected as age categories in order to study a wide age span. Equal intervals between ages permitted the use of orthogonal comparisons in analyzing regression of performance and age.

A request for volunteers was made by the researcher or by a school administrator from which students were solicited. This request stated that white, right-handed subjects of a given age were needed for a study being conducted at the University of Southwestern Louisiana to determine norms for a newly developed test. It was further explained that the test was a card sorting task.

At each of the schools used in the study an arrangement was made with the school administrator for two
adjoining rooms to be used for a waiting area and a testing area. Further arrangements included obtaining groups of ten females and ten males for a period of approximately one hour for each testing period. A list of each group was obtained at least one day prior to testing which included the following information: (1) name; (2) sex; (3) handedness; (4) height and (5) date of birth. Information sheets containing the needed information on each subject were studied by the researcher prior to the testing day and subjects were selected according to the nearest birthday for each age level. In order to maintain task consistency, only right-handed, white students were selected and subjects with unusual height for their age which might have put them at an advantage or disadvantage were not included. An additional list of alternates was secured in case original volunteers were absent from school on the day of testing.

At Montgomery Elementary and Hamilton Elementary Schools, the school principal obtained the subjects from several third grade classes and from the sixth and seventh grade classes. These subjects were tested in groups of twenty, ten females and ten males, at times convenient to their classroom teachers and the class schedule.

The sixteen year old subjects were selected from classes of physical education at Lafayette High School. The Dean of Girls, with the permission of the school principal, solicited the volunteers and obtained the needed
information for each subject. Testing took place during the subjects' physical education class periods.

RESEARCH ASSISTANT

A male senior student attending the University of Southwestern Louisiana and majoring in health and physical education was selected as a research assistant. This assistant along with the researcher tested all subjects in all experimental conditions. This was done to offset any influence the sex of the experimenter might have had as a factor of coaction. Before the actual data collecting was begun, the assistant was fully briefed on the method selected for testing. The assistant was made aware of all aspects of the study and was indoctrinated as to the exact procedure to follow for each testing. Two copies of "Information for Testing Procedure," Appendix A, were prepared so that both the researcher and research assistant would give identical instructions to all subjects.

TESTING EQUIPMENT

A card sorting task was used as the perceptual-motor performance in the study. The selection of the card sorting task was decided upon as a result of a pilot study done by the researcher. The task involved an activity which was suitable from both the motivational and capability standpoints for eight year olds as well as twenty year olds. The thirty-second task consisted of слоттінг
color-coded cards into a color-coded compartmentalized box. The box was composed of six compartments, each a different color. The colors utilized were green, red, yellow, black, white and blue. The size of the constructed box was seventeen inches wide by twelve inches high, thus allowing each compartment to be five inches by five inches in dimension. The cards used in the testing were standard sized playing cards, plasticized for slippage prevention, with a color-coded stripe glued to the middle front of each card. A Swiss made stopwatch by Doro was used for the testing of all subjects.

Testing equipment used in the study is illustrated in Figure 1.

DESCRIPTION OF PERCEPTUAL-MOTOR TASK

As a result of a pilot study conducted with eighty 8, 12, 16, and 20 year old students in the fall of 1974 at the University of Southwestern Louisiana, Hamilton Elementary School, and Lafayette High School, the card sorting task was selected for the study. This task involved an activity which was suitable from both the motivational and capability standpoints for eight year olds as well as twenty year olds. The task could be administered under the two experimental conditions by the researcher and the research assistant in a moderate amount of space. The testing procedure was standardized and was economical in terms of time and equipment. The scoring procedures were
FIGURE 1

TESTING EQUIPMENT
simple and objective. The pilot study further indicated that the procedures did distinguish between groups and levels of treatment.

The card sorting task consisted of a subject attempting to sort a maximum of fifty-two color-coded cards into appropriate color-coded compartments within a period of thirty seconds. Cards were placed one atop the other and held face down in the nondominant hand. The subjects stood facing the compartmentalized box at a comfortable distance so as to be able to slot the cards individually. The bottom of the box was placed even with the subject's waist. The score was determined by the total number of correctly slotted cards for the thirty-second testing period. The total number, each counted singly, constituted a performance score. The maximum performance score was fifty-two.

TESTING PROCEDURES

Each testing period a group of ten females and ten males were assembled. Instructions concerning the testing procedures were read by the researcher. The "Information for Testing Procedure" is provided in Appendix A.

Each subject was tested once under each of the two experimental conditions. The order of performance under the conditions was predetermined for each subject. In condition I the subject competed against a student of the same age and sex (see Figure 2); in condition II, the
subject competed against a student of the opposite sex but same age (see Figure 3). Order of performance was counterbalanced to offset the possible variable of learning.

As the testing session began, the subjects were assigned to a testing station. Identical compartmentalized boxes were placed back-to-back on a table allowing subjects to be facing each other. The examiners stood facing each other across the table and perpendicular to the subjects. Additional instructions concerning the testing procedure were given as necessary by the examiners. The importance of following instructions carefully was stressed and subjects were encouraged to do their best. The subjects were informed that they were in competition with each other.

In order to minimize haphazard and inaccurate card sorting the subjects were told that for every wrongly matched color-coded card, five points would be subtracted from their score. This was not done however. The inappropriately slotted cards were simply not counted in the total. Subjects were told to sort the cards individually and from the top of the deck.

The subjects took two thirty-second practice rounds prior to their first testing. It was felt that practice allowed for orientation to the task which would control the initial learning spurt that characterizes performance in a new task. In this way more reliable performance was assured so that the experimental variable of competition could be studied more effectively.
FIGURE 2

PERFORMANCE IN SAME-SEX DYAD
FIGURE 3

PERFORMANCE IN CROSS-SEX DYAD
At the end of the test the examiners removed the cards from the compartments of the box and scored the results. On both testings subjects were aware of their scores.

STATISTICAL ANALYSIS

The data for the study were performance scores on the card sorting task under two experimental conditions. A split-plot factorial analysis of variance was used. The main plots consisted of four age groups and two sexes; the split-plot consisted of the two experimental conditions. Comparisons were made among the performance means for the following groups: (1) female and male subjects; (2) same-sex and cross-sex competitive treatments; and (3) eight, twelve, sixteen, and twenty year old age groups, and (4) all possible interactions. The results of these comparisons were tested against the null hypothesis for acceptance or rejection.
CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

The data obtained in this investigation were statistically analyzed for the purpose of comparing the results of a card sorting task under different competitive treatments. One hundred twenty males and an equal number of females were tested on the task under two experimental conditions: in competition with a member of the same sex, and in competition with a member of the opposite sex.

The design was a split-plot, with the four age groups and the two gender groups assigned to the main plots and the two treatment effects assigned as the split-plot. Comparisons were made among the performance means for the following groups: (1) female and male subjects; (2) same-sex and cross-sex competitive treatments; (3) eight, twelve, sixteen and twenty year old age groups and (4) all possible interactions.

ANALYSIS OF THE EFFECTS OF THE EXPERIMENTAL CONDITIONS UPON PERFORMANCE SCORES

The analysis of variance of the performance scores of the 240 female and male subjects from the 8, 12, 16 and 20 year old age groups who performed under the two experimental conditions is presented in Table I. Shown
TABLE I

Analysis of Variance of Card Sorting Performance
Scores of the 240 8, 12, 16 and 20 Year Old
Female and Male Subjects Performing Under
Two Experimental Conditions

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Squares</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Sex</td>
<td>325.05</td>
<td>1</td>
<td>325.05</td>
<td>21.98</td>
<td>.01</td>
</tr>
<tr>
<td>B Age</td>
<td>8420.47</td>
<td>3</td>
<td>2806.82</td>
<td>189.82</td>
<td>.01</td>
</tr>
<tr>
<td>Linear</td>
<td>8373.27</td>
<td>1</td>
<td>8373.27</td>
<td>566.26</td>
<td>.01</td>
</tr>
<tr>
<td>Non Linear</td>
<td>47.20</td>
<td>2</td>
<td>23.60</td>
<td>1.59</td>
<td>NS</td>
</tr>
<tr>
<td>AB Interaction</td>
<td>70.62</td>
<td>3</td>
<td>23.54</td>
<td>1.59</td>
<td>NS</td>
</tr>
<tr>
<td>Subj. (Age/Sex)</td>
<td>3430.58</td>
<td>232</td>
<td>14.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C Treatment</td>
<td>7.75</td>
<td>1</td>
<td>7.75</td>
<td>2.59</td>
<td>NS</td>
</tr>
<tr>
<td>AC Interaction</td>
<td>13.00</td>
<td>1</td>
<td>13.00</td>
<td>4.35</td>
<td>.05</td>
</tr>
<tr>
<td>BC Interaction</td>
<td>9.59</td>
<td>3</td>
<td>3.20</td>
<td>1.07</td>
<td>NS</td>
</tr>
<tr>
<td>ABC Interaction</td>
<td>6.57</td>
<td>3</td>
<td>2.19</td>
<td>0.73</td>
<td>NS</td>
</tr>
<tr>
<td>Residual</td>
<td>693.58</td>
<td>232</td>
<td>2.99</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>12977.23</td>
<td>479</td>
<td>27.09</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

With 1 and 232 degrees of freedom, F needed at .05 level 3.88; F needed at .01 level 6.75.
With 2 and 232 degrees of freedom, F needed at .05 level 3.04; F needed at .01 level 4.70.
With 3 and 232 degrees of freedom, F needed at .05 level 2.64; F needed at .01 level 3.87.
With 1 and 479 degrees of freedom, F needed at .05 level 3.86; F needed at .01 level 6.68.
With 3 and 479 degrees of freedom, F needed at .05 level 2.62; F needed at .01 level 3.84.
in Table II are the mean differences in the performance scores for the comparisons made by the analysis of variance shown in Table I.

**Comparison of Performance Scores**
**by Sex of Subjects**

Computation of mean performance scores by sex of subject indicated a highly significant difference in scores. As shown in Table I, the F-ratio for Level A of 21.98 was significant at the .01 level of probability. This significant difference between the females (mean 22.44) and males (mean 20.80) indicated that the overall performances of the females in card sorting were superior to the male performances.

**Comparison of the Effects of the Experimental Conditions Upon Mean Performance Scores**

No significant difference was found in the comparison of the effects of the two experimental conditions, namely, same-sex competition and cross-sex competition upon performance scores. The F-ratio of 2.59 for this comparison (Level C) is shown in Table I. The mean performance score obtained for the same-sex competition was 21.49 and 21.75 for the cross-sex competition condition (Table II).

**Comparison of the Performance Mean Scores**
**of 8, 12, 16 and 20 Year Old Subjects**

The comparison of the performance mean scores of the various age groups (8, 12, 16 and 20 year olds)
### TABLE II

Mean Performance Scores for the Various Comparisons Made in the Two-By-Two-By-Four Analysis of Variance of the Card Sorting Task

<table>
<thead>
<tr>
<th>ANOVA Comparison</th>
<th>Condition</th>
<th>Mean Performance Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>female</td>
<td>22.44</td>
</tr>
<tr>
<td></td>
<td>male</td>
<td>20.80</td>
</tr>
<tr>
<td>B</td>
<td>8 year old</td>
<td>15.72</td>
</tr>
<tr>
<td></td>
<td>12 year old</td>
<td>20.03</td>
</tr>
<tr>
<td></td>
<td>16 year old</td>
<td>23.83</td>
</tr>
<tr>
<td></td>
<td>20 year old</td>
<td>26.90</td>
</tr>
<tr>
<td>AB</td>
<td>8 year old/female</td>
<td>16.58</td>
</tr>
<tr>
<td></td>
<td>8 year old/male</td>
<td>14.85</td>
</tr>
<tr>
<td></td>
<td>12 year old/female</td>
<td>20.52</td>
</tr>
<tr>
<td></td>
<td>12 year old/male</td>
<td>19.53</td>
</tr>
<tr>
<td></td>
<td>16 year old/female</td>
<td>25.27</td>
</tr>
<tr>
<td></td>
<td>16 year old/male</td>
<td>22.40</td>
</tr>
<tr>
<td></td>
<td>20 year old/female</td>
<td>27.40</td>
</tr>
<tr>
<td></td>
<td>20 year old/male</td>
<td>26.40</td>
</tr>
<tr>
<td>C</td>
<td>Same sex</td>
<td>21.49</td>
</tr>
<tr>
<td></td>
<td>Cross sex</td>
<td>21.75</td>
</tr>
<tr>
<td>AC</td>
<td>female/same sex</td>
<td>22.15</td>
</tr>
<tr>
<td></td>
<td>female/cross sex</td>
<td>22.73</td>
</tr>
<tr>
<td></td>
<td>male/same sex</td>
<td>20.83</td>
</tr>
<tr>
<td></td>
<td>male/cross sex</td>
<td>20.76</td>
</tr>
<tr>
<td>BC</td>
<td>8 year old/same sex</td>
<td>15.65</td>
</tr>
<tr>
<td></td>
<td>8 year old/cross sex</td>
<td>15.78</td>
</tr>
<tr>
<td>ANOVA Comparison</td>
<td>Condition</td>
<td>Mean Performance Scores</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>BC (continued)</td>
<td>12 year old/same sex</td>
<td>19.95</td>
</tr>
<tr>
<td></td>
<td>12 year old/cross sex</td>
<td>20.10</td>
</tr>
<tr>
<td></td>
<td>16 year old/same sex</td>
<td>23.83</td>
</tr>
<tr>
<td></td>
<td>16 year old/cross sex</td>
<td>23.83</td>
</tr>
<tr>
<td></td>
<td>20 year old/same sex</td>
<td>26.53</td>
</tr>
<tr>
<td></td>
<td>20 year old/cross sex</td>
<td>27.27</td>
</tr>
<tr>
<td>ABC</td>
<td>8 year old/female/same sex</td>
<td>16.50</td>
</tr>
<tr>
<td></td>
<td>8 year old/female/cross sex</td>
<td>16.67</td>
</tr>
<tr>
<td></td>
<td>8 year old/male/same sex</td>
<td>14.80</td>
</tr>
<tr>
<td></td>
<td>8 year old/male/cross sex</td>
<td>14.90</td>
</tr>
<tr>
<td></td>
<td>12 year old/female/same sex</td>
<td>20.33</td>
</tr>
<tr>
<td></td>
<td>12 year old/female/cross sex</td>
<td>20.70</td>
</tr>
<tr>
<td></td>
<td>12 year old/male/same sex</td>
<td>19.57</td>
</tr>
<tr>
<td></td>
<td>12 year old/male/cross sex</td>
<td>19.50</td>
</tr>
<tr>
<td></td>
<td>16 year old/female/same sex</td>
<td>24.93</td>
</tr>
<tr>
<td></td>
<td>16 year old/female/cross sex</td>
<td>25.60</td>
</tr>
<tr>
<td></td>
<td>16 year old/male/same sex</td>
<td>22.73</td>
</tr>
<tr>
<td></td>
<td>16 year old/male/cross sex</td>
<td>22.07</td>
</tr>
<tr>
<td></td>
<td>20 year old/female/same sex</td>
<td>26.83</td>
</tr>
<tr>
<td></td>
<td>20 year old/female/cross sex</td>
<td>27.97</td>
</tr>
<tr>
<td></td>
<td>20 year old/male/same sex</td>
<td>26.23</td>
</tr>
<tr>
<td></td>
<td>20 year old/male/cross sex</td>
<td>26.57</td>
</tr>
</tbody>
</table>
revealed a highly significant difference. As shown in Table I, the F-ratio for Level B of 189.82 was significant at the .01 level of probability. Mean performance scores of 15.72, 20.03, 23.83 and 26.90 were obtained by the 8, 12, 16 and 20 year olds, respectively (Table II). Regression was then determined by utilizing orthogonal comparisons for the four age intervals. The orthogonal polynomials used were:

<table>
<thead>
<tr>
<th>8 year olds</th>
<th>12 year olds</th>
<th>16 year olds</th>
<th>20 year olds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear</td>
<td>-3</td>
<td>-1</td>
<td>1</td>
</tr>
</tbody>
</table>

The analysis of regression indicated that a highly significant linear trend was evident (Table I) revealing an increase in mean performance scores from eight to twenty years of age. There were no significant deviations from linearity among the age groups.

**Interaction Effects of Sex and Age on Mean Performance Scores**

The F-ratio indicated in Table I for the interaction of age and sex (AB) upon mean performance scores was 1.59 which was not significant at the .05 level of probability. This computation indicated that the difference in mean performance scores between the female and male subjects was uniform and independent of the various age levels.

**Interaction Effects of Sex and Same-Sex and Cross-Sex Competition Upon Mean Performance Scores**

As indicated in Table I, the F-ratio for the interaction of sex and the treatment conditions of same-sex and
cross-sex competition (AC) upon mean performance scores was 4.35 which was significant at the .05 level of probability. This treatment effect revealed that mean performance scores were not the same for the two gender groups under the two experimental conditions. When competition took place between females an average score of 22.15 was obtained as compared to an average score of 20.83 obtained by males competing together. Females averaged 22.73 when competing against the opposite sex and males scored an average of 20.76 under the same experimental conditions, Table II.

Thus, the difference between females and males under same-sex competition was 1.32 and under cross-sex competition, 1.97. Consequently, the difference between females and males was greater when the subjects competed with the opposite sex.

**Interaction Effects of Age Levels and Same-Sex and Cross-Sex Competition Upon Mean Performance Scores**

The F-ratio for the interaction effects of age levels and same-sex and cross-sex competition (BC, Table I) upon mean performance scores was 1.07 which was not significant at the .05 level of probability. Thus the difference in mean performance scores obtained for the 8, 12, 16, and 20 year olds was uniform under the experimental conditions of competition with the same sex and against the opposite sex.
Interaction Effects of Sex, Age and Same-Sex and Cross-Sex Competition Upon Mean Performance Scores

The F-ratio for the interaction effects of sex, age and same-sex or cross-sex competition (ABC, Table I) upon mean performance scores was 0.73 which failed to meet the test of significance at the .05 level. This revealed that differences in mean performance scores were uniform under the two experimental conditions. The sex x treatment interaction effect was the same for eight year olds, twelve year olds, sixteen year olds and twenty year olds.
CHAPTER V

SUMMARY, FINDINGS AND CONCLUSIONS

SUMMARY

The purpose of this study was to compare perceptual-motor performances of females and males at different age levels when competing with members of the same sex and members of the opposite sex. A card sorting task was employed as the parameter to determine the effects of the two treatment conditions. The task consisted of sorting color-coded cards into a color-coded compartmentalized box for a thirty-second period. Two individual practice trials were administered prior to actual competition thus allowing for initial learning of the task. Utilizing a counter-balanced testing order, each subject performed under two treatment conditions: (1) competition against an opponent of the same sex and (2) competition against an opponent of the opposite sex. Two examiners conducted each testing session, one female and one male.

Subjects for this investigation were 240 students enrolled in Lafayette, Louisiana schools at Montgomery Elementary School, Hamilton Elementary School, Lafayette High School and the University of Southwestern Louisiana. Thirty white, right-handed female and thirty white, right-handed male volunteers were selected for each of the age
groups: (1) eight year olds; (2) twelve year olds; (3) sixteen year olds and (4) twenty year olds. Volunteers were screened according to height and handedness to maintain task consistency.

The collected data were subjected to a split-plot factorial analysis of variance. The main plots consisted of the four age groups and the two gender groups while the split-plot consisted of the two treatment effects.

FINDINGS

The findings in this study were as follows:

1. On the card sorting task, performance of females when competing with the same sex and/or competing against the opposite sex were significantly superior to males performing under the same conditions.

2. No significant difference was found in the comparison of female and male performances when competing with members of the same sex and members of the opposite sex.

3. The superiority of the females on the perceptual-motor task was greater under competition against the opposite sex than in competition with opponents of the same sex.

4. Male subjects performed approximately the same in cross-sex and same-sex pairing competition.

5. Regardless of the experimental condition a significant linear improvement in performance with age was found.
DISCUSSION OF FINDINGS

The effects of competition on a perceptual-motor task performance resulted in a difference between sexes with females scoring higher than males. This held true for both same-sex and cross-sex competitive pairings.

As might be expected, it was found that older subjects of both sexes performed better than younger subjects for both competitive experiences. A significant linear response was evident as performance scores became better as age increased with twenty year olds superior to the sixteen year olds, the sixteen year olds better than the twelve year olds and the twelve year olds superior to the eight year olds. These differences between the four age groups and gender groups were consistent under the experimental conditions.

The competitive performances of female and male subjects differed when competing with the same sex and competing with the opposite sex. Female cross-sex competition performance was superior to all other pairings with female same-sex competitive performance second best. Male subjects performed approximately the same when competing with the same sex and with the opposite sex. There was no overall difference between the experimental conditions.

The results were in general agreement with the majority of the studies in psychology and social psychology that reported no difference in cross-sex competition versus same-sex competition. These findings in part confirmed
those of Freischlag. In that investigation, which also utilized a perceptual-motor task, it was indicated that competition with males facilitated female performances. In contrast, however, to Freischlag's findings, this study revealed no differences in male performance in cross-sex and same-sex competition. It was determined in Freischlag's investigation, which coincided with the findings of Kagan, that males were more competitive with other males and females were less aggressive (non-competitive) with other females.

Generally, the subject population utilized in this study have been influenced by the same culture. It is well understood that competitiveness as a part of personality is shaped by society. In this study no significant differences were found when comparing the performance of females and males at different age levels when competing with members of the same sex and members of the opposite sex. Perhaps one rationale for these results coincides with the women's liberation movement and recent legislation guaranteeing equality for the sexes with regard to sports competition programs. A complementary rationale may also be the

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humanistic movement described by Oltman. The author described the present day American culture as a move toward the more humanistic viewpoint which allows for humanity rather than femininity or masculinity. Such a viewpoint would allow for the fullest development of one's potentialities, male or female.

In discussing the significance of masculinity and femininity, Crase pointed out that the development of human potential may never have been more crucial than now during the seventies. The author indicated a need for females to have the same opportunities as males for a variety of options in their lives. It was concluded that one's sex should not be the criterion for exposure to life's possibilities.

One result of present day events has been for the male to view his role as a human being in a more realistic way. It is not uncommon today to find the male assuming the traditional female's role in such things as household chores and babysitting and finding these tasks no threat to his masculinity. It might be assumed that the contemporary female and male view role expectencies quite differently than did their predecessors.


Such role diffusion is now observable at an early age. Children develop concepts and anticipations about competition from childhood game experiences. Such experiences afford the child opportunities to rehearse attitudes of adult cultural forms.\(^\text{54}\) Strong sex-role conditioning has been a part of these early childhood experiences. In evidence today is a changing culture which promotes many coeducational activities along with non-sexist children's games, toys and books.

Some consideration must be given to the task choice of this study. Although a concerted effort was made to employ a non-sexist perceptual-motor task, the researcher had no positive assurance that the task was not more female oriented than male oriented. There might have been the possibility of males perceiving the task as no threat to their masculinity in that they may have viewed the task as more of a female than male task.

Perhaps sex-role standards are changing. In a summary of many researchers' findings, Kagan\(^\text{55}\) proposed that behavioral differences between the sexes when competing is largely a sex-role prescription. Kagan's findings a

\(^{54}\text{Brian Sutton-Smith and John M. Roberts, "Rubrics of Competitive Behavior," The Journal of Genetic Psychology, CV (1964), 13-37.}\)

decade ago suggested that males were more competitive with other females. These role prescriptions did not hold true in this study as males performed approximately the same in cross-sex and same-sex competition on a perceptual-motor skill. The findings of this study seemed to negate those of Magan in that males were no more aggressive (competitive) with males than females but females were aggressive (competitive) with other females and more so with males.

The results of this investigation perhaps provide some possible significance for sports program developers in regard to competition. It appeared that females were aroused by competitive situations and their performances facilitated by cross-sex competition. Perhaps it is time to consider more varied competitive experiences for females. According to Levy and Stacy it is time to concentrate upon analyzing and struggling for the types of changes which would facilitate a genuinely liberated education for all individuals.

Educators need to be aware of any influence throughout the students' school years which might serve as a limitation to human potential. Stereotypical thinking in providing learning opportunities for students can only hamper the fullest development of individual achievement, female or male. Scott has indicated:

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When people have the freedom to truly choose what form of human movement best suits them... then both society as well as education will be much saner. This will happen only when people abandon their obsession with being "masculine" or "feminine" and concern themselves with being human.57

There is a general lack of studies investigating behavioral sex differences in physical activity resulting from treatments such as those utilized in this study.58

It would be advantageous to further examine the effects of competition between females and males at different age levels on perceptual-motor performance.

CONCLUSIONS

Within the limits of this study the following conclusions appear to be warranted:

1. In the task utilized in this study, females out performed males regardless of age or competitive situation.

2. Perceptual-motor performance improved with increased age.

3. Overall, competition with the opposite sex was not different from competition with the same sex. However, there was evidence that competition with the opposite sex enhanced the performance of the females.


RECOMMENDATIONS

Based on a review of the literature and the results of this study, the following recommendations were made:

1. A similar study should be conducted investigating different tasks as to their appeal or gender identification.

2. A study should be made delving into any changes of attitude toward self concept and sex roles with regard to competitive experiences between females and males.

3. An investigation should be made concerning cross-sex and same-sex competition and performance of subjects of different skill levels.

4. A similar study should be done employing two trials, the second trial being administered after the subjects were told the results of the first competition.
SELECTED BIBLIOGRAPHY

A. BOOKS


B. PERIODICALS


C. UNPUBLISHED MATERIALS

APPENDIX
APPENDIX A. INFORMATION FOR TESTING PROCEDURE

(Stand in front of group and away from testing area when giving instructions.)

Today, you are helping USL try out a new test to determine norms for the test (to see how good each of you can do on the test).

The most important thing for you to remember is to do your very best. You will be tested twice. Each time you will have a different opponent. You want to beat the other person, to be the winner.

What you will be doing is sorting cards. You will hold a set of cards which have a color on the front of each of them in your left hand face down. When you are told to "go" you will have 30 seconds to put as many of the color-coded cards into the matching color compartment of the box in front of you as you can. Remember, you must turn only one card up at a time.

Don't worry, you will get to practice twice the first time before your score will actually count. Your score will be how many cards you slotted correctly into the right color compartment of the box. Try not to put the wrong color card into one of the compartments. For each wrong card 5 points will be deducted from your score. So try to place each colored card into the right colored compartment.

It is important to remember that should you drop a card on the floor just forget it and keep going. It will take too much time for you to stop and pick it up.

Remember you are in competition with someone else each time so try to do your very best.

Wait in here for your name to be called. You will return to this room after your first trial and wait to be called again. After you have taken the test twice you may return to your class.

The starting signal is "Ready" - "Go." At the end of 30 seconds you will be told to "stop." Your score will then be counted.

Testers: Use only the following supportive comments during the testing period:

"You're doing good"
"It looks close"
"Do your best"
VITA
VITA

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Title of Thesis: Competition Between Females and Males at Different Age Levels on Perceptual Motor Performance

Approved:

[Signatures]

Major Professor and Chairman

Dean of the Graduate School

EXAMINING COMMITTEE:

[Signatures]

EXAMINATION AND THESIS REPORT

Date of Examination:

April 22, 1975