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AN ANALYSIS OF ACHIEVEMENT MOTIVATION AND
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AN ANALYSIS OF ACHIEVEMENT MOTIVATION
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GYMNASTS

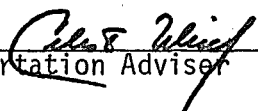
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Joseph M. Fodero

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the Faculty of the Graduate School at
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Approved by


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APPROVAL PAGE

This dissertation has been approved by the following committee of the Faculty of the Graduate School at the University of North Carolina at Greensboro.

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The purpose of this study was to analyse the levels of achievement motivation and the motivational tendencies of male and female collegiate gymnasts. Three broad questions were posed: 1) What differences, if any, are there in the levels of achievement motivation among and between male and female gymnasts classified as high-level and lower-level performers on high-performing collegiate competitive teams and measured by the Lynn Achievement Motivation Questionnaire? 2) What differences, if any, are there among and between male and female gymnasts with respect to their motivational tendencies of a) mastery of skill, b) dynamic interaction, and c) self-regard as revealed from their individual sport motivation sorts via the Berlin Q Sort? and 3) What is the relationship, if any, between male and female gymnasts' motivational tendency toward mastery of skill when adjusting for differences in their scores for achievement motivation?

This investigation involved the voluntary cooperation of 60 men and 60 women from nationally ranked collegiate gymnastics teams throughout the United States. Subjects were classified as high-level and lower-level performers on the basis of their mean gymnastics performance scores for the season falling, respectively, to the right and left of the medians for the distributions of the men's and women's scores. Thus, two male and two female groups of 30 each were obtained.

Collection of the data for ascertaining scores in achievement motivation and the motivational tendencies was done by the writer and the coaches administering the two inventories. The data on gymnastics performance scores were collected by the writer.

Analysis of the data for determining the results to questions one and two was made with a 2 x 2 factorial analysis of variance. An analysis of covariance was made to determine the results of question three. Significance levels at the .01 and .05 critical values were used as criteria to illustrate the range of differences in the results of the analyses.

The results of the analysis for question one showed that no significant differences in levels of achievement motivation were evident between the sexes, between the performance levels of the gymnasts within or between the sexes, or for the combined effect of sex and performance level. The results of the analysis for question two showed that for each of the three motivational tendencies, no significant differences were to be found among the subjects with respect to sex, performance level, or the combined effect of sex and performance level. The results of the covariance analysis for question three showed that the variation in mastery of skill for either sex could not be attributed to achievement motivation. Hence, no evidence of a significant relationship existed between achievement motivation and mastery of skill for these subjects. The covariance analysis did show 1) the men and women gymnasts to be similar in level of achievement motivation and 2) a similar, but low correlation between mastery of

skill and achievement motivation for either sex.

In addition to the similarity found in levels of achievement motivation of these subjects, a consistency in similarity was revealed in the analysis of their motivational tendencies. The same rank order (highest to lowest) prevailed for each of the four groups: 1) self-regard, 2) mastery of skill, and 3) dynamic interaction.

The main conclusions drawn from this study are these: 1) men and women gymnasts of high-performing teams are not differentiated by their performance levels in their need to achieve or in their motivational tendencies; 2) men and women gymnasts of high-performing teams are more alike than different as regards their need to achieve and their motivational tendencies in gymnastics competition; and 3) the similarity between the sexes in all measures makes it imperative that equality prevails in all aspects of gymnastics and possibly other sports as well.

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CHAPTER I

INTRODUCTION

Research in the dynamics of human motivation is a concern of behavioral scientists. Achievement motivation, one facet of human motivation, has received considerable attention, particularly since the early 1950's. This attention has been fostered largely through initial and continuing efforts by McClelland et al. (1953) and their followers. Research in achievement motivation as it relates specifically to sport is of recent origin and interest. The achievement motivation of both women and men in sport is of more recent concern.

The focus of this study was upon the achievement motivation of male and female gymnasts on collegiate gymnastic teams. To a certain degree, this study can be viewed as an extension and/or expansion of several works preceding it. These works are reviewed in Chapter II. As such, it represents an attempt to contribute to the understanding of achievement motivation in sport.

Statement of the Problem

The purpose of this study was two-fold. One concern was to examine achievement motivation of male and female gymnasts as it may be related to their performance levels as members of "high-performing" collegiate competitive teams. A second concern was to examine three

motivational tendencies that are purported to make up the achievement motivation construct pertinent to sport: 1) mastery of skill, 2) dynamic interaction, and 3) self-regard.

This investigator desired to find answers to the following specific questions:

- A. What differences, if any, are there in the levels of achievement motivation among and between male and female gymnasts classified as high-level and lower-level performers on high performing collegiate competitive teams and measured by the Lynn Achievement Motivation Questionnaire?
 1. Is there a difference in level of achievement motivation between high-level and lower-level performing male and female gymnasts on "high-performing" collegiate competitive teams?
 2. Is there a difference in level of achievement motivation between male and female gymnasts in the high-level gymnastics performance classification as well as between male and female gymnasts in the lower-level gymnastics performance classification?
- B. What differences, if any, are there among and between male and female gymnasts with respect to 1) mastery of skill, 2) dynamic interaction, and 3) self-regard, as revealed from their individual sport motivation sort via the Berlin Q Sort?
 1. Is there a difference in the motivational tendencies of mastery of skill, dynamic interaction, and self-regard

between high-level and lower-level performing male gymnasts as well as for high-level and lower-level performing female gymnasts on high-performing collegiate competitive teams?

2. Is there a difference in the motivational tendencies of mastery of skill, dynamic interaction, and self-regard between male and female gymnasts in the high-level gymnastics performance classification as well as between male and female gymnasts in the lower-level gymnastics performance classification?
- C. What is the relationship, if any, between male and female gymnasts and their motivational tendency referred to as mastery of skill when correcting (adjusting) for differences in their scores for achievement motivation?

Definition of Terms

As used in this study, the following terms apply:

High-performing teams--those collegiate competitive gymnastics teams in the United States that have, during the 1974-75 competitive season, averaged scores of 200 or above and 95 or above, respectively for men's and women's teams. (Theoretical perfect scores of 240 and 120 can be obtained, respectively, for male and female teams.)

Male gymnast--a man who has completed one full year of collegiate competitive experience on a high-performing team.

Female gymnast--a woman who has completed one full year of collegiate competitive experience on a high-performing team.

High-level performer--a male or female gymnast whose mean performance score for the 1974-75 dual meet season fell to the right of the median of all the scores obtained for male and female gymnasts, respectively.

Lower-level performer--a male or female gymnast whose mean performance scores for the 1974-75 dual meet season fell to the left of the median of all the scores obtained for male and female gymnasts, respectively.

Achievement motivation--the striving to maintain the highest proficiency possible of one's capability in all activities in which a standard of excellence prevails and whereby the performances of such activities can either succeed or fail (Heckhausen, 1967). Hereafter this term will also be referred to as n Ach.

Motivational tendencies--those specific, personal factors that comprise an individual's motivational construct pertaining to sport. Three motivational tendencies applicable to this study are described as follows:

1. Mastery of Skill (MS)--the competence of an individual's selective, directive, and persistent exploration with his/her sport environment (White, 1959).
2. Dynamic Interaction (DI)--the overt display of an individual to belong to and contribute to the maintenance of a sport group as well as to experience socially rewarding relationships in that group (Rogers, 1961).

3. Self-regard (SR)--the perceived value an individual holds of his/her worth as a member of a sport group.

Assumptions Underlying this Study

In the conduct of this study, the following assumptions were made:

- A. Collegiate gymnastics teams in the United States scoring 200 or 95 above for men and women, respectively, during the 1974-75 competitive season, typify teams which include individuals who are of championship calibre.
- B. The male and female gymnasts being used as subjects are representative of high-level and lower-level performers typical of high-performing men's and women's collegiate teams throughout the United States.
- C. The Lynn Achievement Motivation Questionnaire is considered a valid n Ach measuring device for the population under consideration in this study.
- D. The Q sort instrument as developed by Berlin with selected statements revised by the investigator is considered a valid assessment device to measure the motivational tendencies to be examined in this study.
- E. The three motivational tendencies -- MS, DI, and SR, found by Berlin through factor analyzing women's sport motivation--are applicable to men.

Scope of this Study

This study entailed the following limiting factors:

- A. Collegiate teams throughout the United States were considered for selection of subjects. The ultimate number of subjects obtained was contingent on both the cooperation of the coaches and the number of teams that met the definition requirement of the teams used.
- B. All measurements were administered by the investigator for teams in the northeast section of the United States. In cases where this was impractical, measurements were made by the respective coaches in accordance with established procedures written by the investigator and sent to such coaches. In either case, all measurements were made within the first third of the competitive season.

Significance of this Study

It is accepted that achievement motivation is but one of several factors contributing to the success of an athletic performance, but it is considered to be an extremely important factor and worthy of investigation. Vroom's (1964) work led him to state that "More is to be gained from increasing the motivation of those who are high in ability than from increasing the motivation of those who are low in ability" (p. 203). Taking this as a cue, as well as considering other vital contributing factors of athletic success such as perception and physiological fitness, it appears that performance is very dependent upon achievement motivation.

McClelland (1961) apparently felt that the achievement motive has a strong influence in sports participation. He postulated: "People with a high level of Achievement show much inner concern with doing something well. . . . Shouldn't they, then, be interested in competitive games where they will have a chance to achieve" (p. 322)? In terms of McClelland's research, this study is timely; moreover, the timeliness of this study lies with the growing interest in sport as well as with the current research in sport motivation (Arp, 1972; Berlin, 1971; Burton, 1971; Gorsuch, 1968; Plummer, 1969; Webber, 1970; and Willis, 1968).

The quality performance among female athletes and the attendant demands for equality of opportunity in all realms of sport participation also makes this study significant. A change in attitudes concerning women's participation in competitive sports is evident.

Just two decades ago, a rather conservative view was found by McGee (1956) in her study of attitudes toward intensive sports competition for high school girls. Although parents and coaches harbored favorable attitudes, school administrators and other teachers were not as favorably disposed. In a comprehensive review, Cheska (1970) noted that, historically, the female has been restrained in her efforts to participate in sports and that it is only in recent years that females have gained more access to sport, albeit slowly. She noted that much female restraint has been culturally induced, clustering primarily around a self-image conflict; that is, sports engender a display of aggressiveness, ambition, independence, and devotion to a goal, traits

which are often considered unfeminine. Cheska indicated that these views and other similar attitudes are now giving way to more rational views, such as change of attitude toward the human body as an instrument of expression, not of repression.

In two recent studies involving men's attitudes toward women participating in competitive sport, both DeBacey et al. (1970) and Harres (1968) found that men held favorable attitudes toward women participating in sport. The findings of DeBacey and her associates did not differentiate between male physical education majors and male non-majors regarding attitude toward competition of female athletes, while Harres found no significant differences between the attitudes of men and women concerning the desirability of athletic competition for girls and women.

If competition as viewed by Loy (1968) is a struggle for supremacy between two or more sides and between man and other objects of nature, both animate and inanimate, it would appear incongruous for women to compete less than intensely just to maintain a culturally proscribed model of femininity. Further, if sport, as viewed by Loy, is an "institutionalized game" demanding the demonstration of "physical prowess," does "institutionalized" infer a restriction to sex?

It is possible that the results of this study will yield some insights into the underlying factors that contribute to the achievement motivation of a gymnast. Further, the study might help educators to gain an understanding of differences, if any, between males and females with regard to competitive performance.

CHAPTER II

REVIEW OF RELATED LITERATURE

This review consists of four sections. It begins first with a perspective of the sport of gymnastics with emphasis on the development of competitive gymnastics in the United States. The second section focuses upon the female as a participant in competitive sports. The third section of the review provides for an account of the theoretical basis upon which the concept of achievement motivation (n Ach) has evolved. Achievement motivation research applicable to participation in competitive sports is the topic of concern for the fourth and last section of the review.

A Perspective of Competitive Gymnastics

The term "gymnastics" as it is now used, connotes activities which differ in form and purpose from its original meaning. Yet, the current status of gymnastics contains traces of its earlier forms. It seems advisable, therefore, in presenting a perspective of competitive gymnastics, to look first at the origin and meaning of gymnastics, then follow its development to its current status.

The concept and meaning of gymnastics. A review of the literature indicated that gymnastics can be categorized in two reference frames. One is denoted as "systematized forms of exercise designed to produce particular effects on the body" (Munrow, 1963, p. 3). The other is

construed as "competitive gymnastics" (Charteris, 1969). The first reference frame would include the many "systems" of physical training including the more recent type referred to as educational gymnastics or movement-training, education, or exploration. The second would conceive of gymnastics as a competitive sport which embraces 1) the four and six Olympic apparatus events of women and men, respectively, plus 2) modern rhythmical gymnastics. The difference between these two forms of competitive gymnastics is that in the former, the individual performs upon the apparatus, while in the latter, the individual performs with the apparatus in the form of hand implements such as balls, hoops, streamers; and modern rhythmical gymnastics is engaged in by women only. Furthermore, a review of the literature revealed that gymnastics is inextricably bound up with the development of systems and philosophies of education in general. Early leaders such as Comenius, Locke, and Rousseau, advocated physical activity as a fundamental aspect of education (Zeigler, 1973).

Regardless of whether gymnastics is conceived of as a sport form or a system of training, its very nature has a distinct movement form. In the case of apparatus activities, the form could be considered artificial or unnatural insofar as human locomotor movements are considered. The modern rhythmic activities could be considered more representative of natural locomotor movements indigenous to the human physique (Munrow, 1963; Charteris, 1969). An explicit description of the nature of gymnastics is probably best offered by Metheny (1965) who said:

The gymnast deals almost exclusively with the action of gravitational forces on his own body. Every stunt or event in gymnastics is a metaphorical re-enactment of the drama of man using his own powers to overcome the forces that act on him. By deliberately putting himself in situations where he will be acted on by forces greater than those he encounters in his daily life, and then demonstrating his ability to overcome those forces, the gymnast makes more articulate his awareness of himself as a powerful being that can, to some extent, overcome the forces that seem to structure his life. (p. 86)

Metheny is apparently referring to the suspension and supporting of one's weight upon the arms and the subsequent intricate rotary and twisting movements performed in these positions plus the thrusting movements of the legs and arms to propel the gymnast from the apparatus.

Origin and development of gymnastics. Among the earliest records indicative of gymnastic activities are those of the ancient Chinese from 1100-800 B.C. According to Van Dalen et al. (1953), history recorded the Chinese practicing "Con Fu," an exercise system resembling the "medical gymnastics" of the Swedish Ling System. Prior to that time, archeological evidence noted by Palmer and Howell (1973) demonstrated tumbling and acrobatics in Egypt from 3000-1100 B.C.

The Greeks showed tangible evidence of a systematic form of gymnastics as reflected in Aristotle's Politics and Plato's Republic. Both refer to gymnastics in their discourses on the subject of education (Jowett, 1943, 1946). In Ancient Greece, the word "gymnastics" meant the exercise of boys and youth in naked form, hence its meaning, "naked art" (Price, 1950). Further, the exercises according to Price, were for the purpose of physical and military training and consisted of natural movements which included climbing, running, throwing and

lifting events, in addition to wrestling, boxing, and dancing. In this respect, the gymnastics practiced by the Ancient Greeks imply, according to Forbes (1929), an entire system of physical education.

The concept of gymnastics as being synonymous with physical education has prevailed up to the 20th century and, to some extent, exists today. It is interesting to note that the word "gymnastics" is presently defined in terms of "physical exercise." Competitive routines are also referred to as "exercises" indicating that the sport form of gymnastics has not quite freed itself of the shackles of exercise systems. The confusion of definition contributes to the general public's idea of gymnastics which currently connotes a sport form primarily, and secondarily, a movement form within the realm of physical education.

Gymnastics as it is known currently, particularly by its practitioners, had its origins toward the end of the 1700's. Many individuals and several countries in Europe account for its development.

Johann Guts Muths is considered the "Grandfather of Gymnastics." According to Leonard (1915), this honor was bestowed upon Guts Muths as a result of his more than fifty years (1786-1839) of service and writings which included Gymnastics for Youth, considered as the first text on the subject. Guts Muths employed Greek gymnastics but added new activities which included see-saws, climbing ropes, and poles, balance beams, and vaulting apparatus in his first gymnasium which was outdoors (Price, 1950). Price also mentioned that the teaching methods of Guts Muths embodied the philosophies of idealism, materialism, and realism in that they provided for children and adults alike and included "carefully selected exercises for girls" (p. 4).

The period marked by the end of the 18th and beginning of the 19th centuries gave rise to nationalism as a result of political and industrial turmoil. Accompanying this was an impetus to education in general and gymnastics in particular (Van Dalen et al., 1953).

Friedrich Ludwig Jahn is regarded as the "Father of Gymnastics" in that he added new activities including the invention of jumping standards and pits, ladders, vaulting bucks, balance beams, the horizontal bar, the parallel bars, and the side horse with pommels (Price, 1950). Jahn is regarded as the founder of the Turnverein (German gymnastic societies). His efforts to utilize gymnastics as a means of promoting physical and moral strength which in turn would be used to foster patriotic sentiment and national unity were carried out (Leonard, 1915).

Other European leaders of note are Pehr Ling of Sweden and Miroslav Tyrš of Czechoslovakia. Ling attempted to imbue the youth of Sweden with the importance of physical fitness, and he established the Royal Central Institute for Gymnastics in Stockholm. He is primarily known, however, for his scientific approach to gymnastics which he derived through the study of anatomy and physiology. Much of Ling's approach along this vein was theoretical (Leonard, 1915). Fruition of Ling's scientific emphasis is actually credited to Lars Gabriel Branting, one of his successors. Branting directed Ling's theories toward a therapeutic system, hence, Swedish Gymnastics is also known as medical or corrective gymnastics (Frost, 1975).

Tyrš developed a system along the lines of Jahn but seemingly greater in scope and/or depth. His system, like that of Ling and Jahn,

has influenced the gymnastics programs of the physical education curriculum in American schools. Competitive gymnastics in this country emanated from the systems of Jahn and Tyrs. The immigrants of their respective countries were the carrier agents.

Miroslav Tyrs, a professor of philosophy at Charles University in Prague, created the Sokol movement in 1862. Like Jahn, whose Turner movement was a response to the French oppression led by Napoleon, Tyrs' Sokol movement was in response to the cultural and political repression of the Czechs under Austro-German domination and the Slovaks under oppressive Hungarian rule (Bednar, 1966).

Tyrs held to the principle that the nation is the fundamental social unit and involved all social classes. Moreover, his system incorporated an aesthetic ideal similar to the ancient Athenians. He rejected a "superman" type as advocated by Jahn and espoused the development of man whose intellectual, moral, and physical abilities would be used for a life of brotherhood and general benefit to society. The name "Sokol" was chosen as it means falcon, a bird known for its courage, endurance, speed, and its love for soaring high (Bednar, 1966).

Tyrs methodically and thoroughly set up a system of gymnastics that is carried out along the same principles today in Sokol units here and abroad. His system consists of four departments: 1) calisthenics (included dance) and marching tactics, 2) exercises with hand implements and upon heavy apparatus, 3) human pyramid building, and 4) combatives (Bednar et al., 1968). These activities were organized into groups according to sex and age beginning with primary school

children and continuing to "seniors" (past the state of elite competition and continuing into old age). The content of Tyrs' system, although gymnastic-oriented, is strikingly similar to the philosophy of physical education of this country in terms of principles.

Development of gymnastics in America. The first programs of physical education in America were gymnastic-oriented. This was due to a large influx of German immigrants in the early 1800's among whom were followers of Jahn who came to this country at the invitation of American educators (Price, 1950). Such men as Charles Beck, Charles Follen, and Francis Lieber established gymnasiums and programs patterned after Jahn's German system of gymnastics.

Wherever German immigrants settled in large concentrations, they organized and established "Turnvereins" as a means of continuing their gymnastics activities as well as maintaining their heritage. These societies formed the North American Turner Bund (Gymnastics Union) in 1850 through which they promoted gymnastics. A hallmark of their success was the establishment of the Normal College of Gymnastics in 1866. This is the oldest school in America for the purpose of training physical education teachers. The supply of teachers for schools and clubs throughout the country by this institution accounts for the German system of gymnastics dominating the early physical education curricula in America. The school is now situated in Indianapolis and is affiliated with the University of Indiana (Price, 1950).

Similar to the Turner movement was the Sokol movement promoted by Czech immigrants who came in large numbers to America in the mid-1800's.

The first Sokol unit in America was established in St. Louis in 1865, three years after it was begun by Tyrs, its founder. It was joined in 1896 by the "American" Slovaks in New York. The organization is now known as Sokol U.S.A., reflecting the amalgamation in 1965 of seven factions of the Sokol organizations in America (Bednar, 1966). Like the Turners, the Sokols engaged in gymnastics for competition and for the masses, a principle they advocated for the physical education programs in American schools.

Competitive gymnastics was conducted among the YMCA's which contributed to the development of physical education in America through its International Training School established in 1885 which is now Springfield College (Frost, 1975). Late in the 1800's competitive gymnastics was sponsored by the A.A.U. It was not until the beginning of the 20th century, however, that competitive gymnastics was conducted in the schools, and it has only been in recent years that competitive gymnastics has been promoted by the schools. The popularity, in general, of gymnastics as a competitive sport did not begin until after the beginning of the modern Olympics in 1896 (Runkle, 1958).

Competitive gymnastics in America was confined at first to the Turner and Sokol organizations in the form of inter-club competition and within the Turnerfests and Sokol Slets. These were mass festivals conducted on regional and national levels and patterned after those in Germany (Turnerfests) and Czechoslovakia (Slets). Standards of competition were lacking in gymnastics until 1890 at which time, through the joint efforts of the North American Turner Bund and the A.A.U., a

set of rules for competition was established (Moore, 1938). Some gymnastics competition did take place in education at the university level. The first meet took place either at the University of Chicago in 1898 or at New York University in 1899 (Runkle, 1958).

Various reasons were given for the erratic growth and/or delay of competitive gymnastics, and for that matter, educational gymnastics. It is plausible that the main reason was the retreat from the formalistic nature of gymnastics (physical education) and the attraction to a games and recreation-oriented program (Van Dalen et al., 1953).

Competitive gymnastics, as well as gymnastics in general, thus remained in somewhat of a state of limbo up to post World War II. The majority of competitive gymnastics was conducted under the auspices of the A.A.U. and mainly through the leadership of Roy E. Moore and George J. Gulack (Laptad, 1972). Moore is credited with initiating American participation in Olympic competition in 1920 and in having the International Federation of Gymnastics (F.I.G.) accept the A.A.U. as the American sanctioning body for international competition. During this period, competition centered around the areas of Philadelphia, Minneapolis and Los Angeles and was predominately in Turner organizations. The better women's teams were from the Philadelphia Turners while the Swiss Turners of Hudson County, New Jersey, had the strongest men's team.

Growth of competitive gymnastics was slow and sporadic in the sphere of education. Although collegiate gymnastic leagues were developed, they were comprised of few teams and it was not until 1938

that the first NCAA championship was held in accordance with a rules structure established in 1931 (Runkle, 1958). Significant factors preventing gymnastics from fading out were various programs and exceptional leadership. The Springfield College gymnastics exhibition teams of Leslie Judd traveled throughout the New England and eastern areas stimulating interest in the sport; the Gymkana Troupes of Hartley Price at the University of Illinois and later at Florida State developed interest in the Midwest and promoted gymnastics in the South. Other groups which helped to sustain the public's interest in gymnastics were the East Stroudsburg State College gymnastics exhibition team and the Brooklyn Central YMCA (Price, 1950; Baley, 1965).

Competitive gymnastics in America. From the meager gymnastic activity outlined above, gymnastics evolved into an expanded and sophisticated form following World War II. The growth is attributed in part, to the promotional efforts of the AAHPER as a result of a subscription to physical fitness. Notwithstanding the influence of the AAHPER, however, note must be taken of the leadership by various individuals with strong commitments to the sport of gymnastics.

The first two significant factors in the expansion and sophistication of gymnastics were 1) the formation in 1950 of the National Association of College Gymnastic Coaches (NACGC) spearheaded by Chet Phillips, then the Navy coach and 2) the National Gymnastics Clinic which is held annually at Sarasota, Florida, organized in 1951 by Lyle Welser, then the coach at Georgia Tech. (Loken and Willoughby, 1967). The former event was instrumental in strengthening the posture of

competitive gymnastics at the collegiate level while the latter did much to educate individuals at all levels and in all aspects of men's and women's gymnastics.

The growth in competitive gymnastics from 1950 to the present could be considered phenomenal. Gymnastics programs, although not as numerous as others (e.g., 36,834 boys and 61,424 girls in gymnastics compared to 114,645 boys and 73,946 girls in swimming (Fagen, 1974) in American high schools) are conducted in schools, colleges, independent clubs and organizations. In addition to programs being conducted at all levels, various aspects of gymnastics such as Olympic competition, rhythmic gymnastics, and trampolining, are engaged in.

Certain patterns of development have occurred in men's and women's competitive gymnastics. Collegiate competition was sporadic despite the first NCAA championships in 1938. Not until after 1950, with the stimulus provided by the NACGC cited earlier, did men's collegiate gymnastics have much impact. For example, the hosting of the national championship during its formative years by the University of Chicago restricted the exposure of gymnastics on a nation-wide scale. A rotation of the national championship site began as a matter of policy in 1950 and continues to this day (Gura, 1974). The lack of NCAA championships from 1943-1947 due to World War II was also a deterring factor (Gura, 1974). In addition to these factors, the competitive format also proved to be a deterrent. The NCAA Rules Committee, holding to the belief that the public would be more receptive to individual events, did not include the Olympic all-around, nor require compulsory routines.

During the formative years the events were not consistent with the international format (Laptad, 1972).

The competitive format for dual meets and championships went through a series of modifications involving the individual events and the all-around. This account is methodically detailed in Runkle (1958) Laptad (1972), and Gura (1974). In general, the earlier competitions were held in Olympic events and events indigenous to America, such as flying rings, rope climb, and tumbling, all three of which were dropped after 1961, 1962, and 1964, respectively (Gura, 1974). The all-around did not consist entirely of the Olympic events until 1953 (Gura, 1974). Competition involved place winners just as for the individual events, but this occurred only in championship events.

The scoring method, like the event format, also went through a series of changes until now when it has become consistent with international procedures. In its formative years, place points were accorded in each event for each team for dual competition, the point value and number of places varying from time to time with rule changes. This system changed as it was unfavorable to coaches and gymnasts alike. The main objection was that a place scoring did not reflect the true value of a performance or the strength of a team, a point elaborated upon very convincingly by Carl Patterson (1965), former coach at Temple. The contention was that a first place for one person could be attained by a routine valued at 9.2 by the international scoring method while a first place for an opposing individual could be attained by a routine valued at 7.8 for example. In 1966, undoubtedly due to

the sentiment reflected by Patterson, the system of adding the top three scores in each event for team points was adopted (Gura, 1974) which prevailed until 1974. It was then changed to include the top four scores.

It should be noted that the F.I.G. "Code of Points," formulated in 1949 and since revised twice with the third revision due in 1976, was a factor not only in changing the scoring format but figured in the improvement of gymnastics officiating. The lack of uniform standards for evaluating gymnastics performances led to much ill feeling. Thus, the adoption and further revision of the Code led to a more universal as well as better way of judging gymnastics (Gander, 1968).

Along with the above trends, an evolution toward the all-around has occurred. Shortly after the adoption of the international scoring method, rule changes required that a team's entry consist of a designated all-around performer. Beginning in 1968, and applying only to championships, the all-around competitor was required to perform compulsory routines as well as optional routines. This was changed shortly thereafter to include the specialists as well, and by 1971 the team score was composed of the optional and compulsory results for championship competition (Gura, 1974). Current rules allow for five entries per event with the top four scores counting for team points, two of which must be posted by all-around performers (Gagnier, 1974). The thinking behind this was hopefully to allow for better preparation for international competition.

In addition to the Olympic all-around events is the trampoline. Since it was first included as a competitive event, this apparatus has been the object of an erratic history. It was included in collegiate competition under various specifications during the period from 1948 to 1968. Some conferences included it while others did not; at one point it was included only during the national team championship, and later, until its exclusion in 1968, it was part of the dual meet format (Gura, 1974). At present trampolining is competed in as a separate gymnastic sport. This began in 1964 on an international basis and since 1971 nationally (Laptad, 1972; Munn, 1971). Even though the trampoline is no longer part of the dual meet format, it is very much a part of the instructional and training regimen for gymnastics. It is used extensively for developing spatial orientation in the rotary and twisting movements indigenous to competitive gymnastics.

Tumbling, which was also dropped from the dual meet format as mentioned above, has been treated much the same way. The Second Elite National Tumbling Meet, conducted by the United States Tumbling Federation, was held on April 26, 1975, in Illinois ("What's Happening!" 1975).

There appears to be a competitive balance throughout the country, particularly with the emergence of stronger southern teams, notably Louisiana State University at Baton Rouge, and Georgia Southern. At one time or another, the South, East, Mid-east, Mid-west, and the West have all been represented with team as well as individual champions. A result of the growth of gymnastics is the organization of various leagues and conferences in both the university and college competitive classifications.

Progress in the men's collegiate gymnastics program is perhaps best reflected in the make-up of our Olympic Teams. Only one member of the 1936 Men's Olympic Gymnastic Team was a collegian. The number of college men increased to five of the eight-man squad in 1948 and then to six of the eight in 1952. The seven-man 1956 Olympic Team consisted entirely of collegians. This trend has been maintained up to the present (Laptad, 1972). It should be noted, however, that a number of these men were also affiliated with organizations such as the YMCA, Turners, and Sokols. Thus, the concerted efforts of many individuals and organizations were instrumental in the development of men's collegiate gymnastics.

Women's collegiate gymnastics. Of recent origin, women's gymnastics is consistent with the growth of women's collegiate athletics. As was the case for the men, women's competitive gymnastics was prevalent in the various societies and in A.A.U. competition. A growing amount of interest and activity in gymnastics seemed to be the stimulus. For example, it is of interest to note that during the period of 1960 to 1966 when boys' and girls' high school programs increased tenfold (Laptad, 1972), the first two National Institutes on Girls Sports, which were also held during this period, were devoted, in part, to gymnastics. The first, held at the University of Oklahoma in 1963, devoted a major portion of the institute to gymnastics in that sixteen presentations were made by men and women alike while the second institute, held at Michigan State University, included a substantial program in gymnastics with eight presentations ("National Institute," 1965, 1966).

Whether a relationship existed between the Institutes and the tenfold increase in high school gymnastics programs is conjecture. Nevertheless, some credence is lent to this conclusion in that a spurt of growth in high school girls' programs occurred at this time (Laptad, 1972).

Another factor that appears to have had impact on the colleges was the high quality of gymnastics within some of the independent girls' gymnastic club programs.

The first women's collegiate competition took place at Washington University (St. Louis, Mo.) in 1965. It was termed the First National Invitational Gymnastic Championships for College Women. The meet involved 37 women representing seven colleges of which Southern Illinois University emerged as the winning team. Sponsorship of the meet was made jointly by the Division of Girls' and Women's Sports (DGWS) and the host school (Vogel, 1965). The competition in the following year was termed "The 1966 Collegiate Open Gymnastic Championship for College Women." The title change to the word "Open" was made to underscore the fact that the meet was not a National Championship since there was still lacking an official governing body for women's collegiate gymnastics competition. As such, the "College Open" was "a prestige opportunity . . . in which the college women and collegiately oriented teams can seek out and find competition among their peers" (Uphues, March, 1966, p. 7). (Although the first DGWS Gymnastics Guide was published in 1963, it should be noted that its function was service and promotional in nature in line with the purpose of DGWS and not a sanctioning document). This meet was conducted along the standards of

the DGWS and utilized the competitive guidelines of the F.I.G. The Southern Illinois team repeated as champions. Thirty-five competitors and twelve teams were involved, an increase of five from the previous year. Of the 5800 people who viewed the two day affair, 3200 witnessed the finals, which reflected its popularity (Uphues, 1966).

The first nationally sanctioned collegiate meet was held under the governance of the DGWS in 1969 at Springfield College which won the team title. In subsequent officially sanctioned collegiate championships, growth continued. In 1972 at the 4th DGWS national championship meet for example, 148 women from 44 schools participated and were viewed by 4000 spectators. Springfield won the team title, repeating its effort of 1971; the second championship (1970) was won by Southern Illinois University (Jacobson, 1972). In connection with the reorganization of the AAHPER, the fifth national women's collegiate gymnastics championships (1973) were governed by the Association of Intercollegiate Athletics for Women, formed in 1971. This meet was held in Des Moines, Iowa, with Grand View College repeating as the host. Continued growth was evidenced by the 152 entries representing 52 colleges from 25 states. Massachusetts won the team title. Also of note was the improved caliber of skill, judging from the individual performance scores as well as team totals (Jacobson, 1972).

The national women's collegiate championships continue at the present under the control of the AIAW. Similar to the NCAA Gymnastics program, the AIAW Gymnastics program has shown growth in quantity and

quality. Reflecting this are individual event scores ranging from 8.975 to 9.375 for the six place winners; all-around scores ranging from 35.40 to 36.40 for the top ten competitors, and the first six team scores ranging from 100.00 to 108.60 in the 1974 meet (Thatcher, 1974). The most recent meet, held at California State College in Hayward in 1975, "provided some 9000 spectators with the highest caliber of competition yet witnessed at the intercollegiate level of women's gymnastics" (Fields, 1975, p. 18).

In addition to Olympic Gymnastics, women also have the opportunity to participate in Modern Rhythmic Gymnastics, a form that has actually been reborn, consisting of free movements performed by a team or individual using hand implements. A full description and history of this new competitive gymnastic sport is detailed in the DGWS Gymnastics Guide (Schmid, 1969). There has been world competition since 1963 while in the United States competition began in 1973. The first National Championships were held at George Williams College in connection with the selection of the team to compete in the World Championship at Rotterdam, Holland (Prchal, 1973).

High school and independent clubs. These two organizations for competitive gymnastics can be considered vital to the popularity as well as quality of gymnastics. High school programs for boys and girls country-wide have developed rapidly which appears to be related to the growth of the collegiate programs. For example, an analysis of the make-up of the Olympic Teams from 1952 to 1960 shows several gymnasts repeating as members on subsequent teams. The personnel on the teams

after 1960 show much difference in the membership. Although this may be a result of keener competition for a team berth due to more and better high school programs, Gene Wettstone lamented this situation. He said, "We'll probably have a different team in Montreal" which he felt was a deterrent in regard to the prospects of the American gymnasts in the 1976 Olympics. Wettstone contended that it takes longer than four years of college to mature into an international gymnast, and he decried the fact that many national caliber men gymnasts do not continue competition via club programs after graduating from college (Wettstone, 1974).

Obviously, the problem in terms of our international posture is not due to the high school programs. More and more gymnasts are emerging from these programs. For example, all eight regions of the country showed competition among boys and girls in the 1974 high school report. Moreover, the individual and team scores are indicative of high calibre performance. The text of the winning routines verify this, for many of the moves are of an advanced classification ("High School Report," 1975). Much of the progress in the high school gymnastics program is attributed to its leaders having organized into the National High School Gymnastics Coaches Association at Iowa City in 1964. It was felt that the formation of the NHSGCA would enable a pooling of efforts that would benefit high school gymnastics programs (Lesch, 1966).

In terms of quality, the programs in Illinois, California, and the Philadelphia and Pittsburgh areas of Pennsylvania are of note. With the recent growth, programs of high calibre are evidenced in New

Jersey and the central and metropolitan areas of New York State; parts of the southwest, notably Texas; and in the mid-west, notably Iowa. A further example of the quality of high school programs was the first National High School Gymnastics All-Around Invitational (Biesterfeldt and Ray, 1975). Twelve boys from seven states competed in an exclusive all-around meet. The scores for the top ten participants ranged from 47.10 to 54.95 suggesting that the group was comparable to a national calibre college team.

Independent gymnastics clubs. These groups are proving to be an extremely potent force in American Gymnastics, particularly with regard to women's gymnastics. These clubs which have organized into the United States Association of Independent Gymnastic Clubs are experiencing rapid growth. For example, at the time of the formation of the USAIGC, it included more gymnasts than any other gymnastics organization. It had a membership of 145 clubs (Criley et al., 1973). The impact of this organization resulted in establishing a department entitled "Club Corner" in the Gymnast featuring its activities (Sundby, 1973).

Among the more popular clubs are those which have been established earlier and which include the SCATS of California and the Mannettes of Philadelphia, both of which have had members on Olympic and World Teams; e.g., Cathy Rigby, Kim Chase, and Debbie Hill of the SCATS and Joan Moore Rice and Ann Carr of the Mannettes (Thatcher, 1973; Friedman, 1974). An indication of the appeal these clubs have is the size of their memberships which amount to hundreds for a single club,

many of which include teams at several levels.

The effectiveness of the club program is best reflected in the make-up of the women's World and Olympic Teams. The complete roster of the 1972 Women's Olympic Team was a product of the club system, a situation along which prompted an insightful comment by an American official. Tom Maloney remarked that "the present college program is evidently a failure in so far as developing all-around gymnasts of international calibre is concerned," and suggested that the American men need a club program for the purpose of training while they are both in and out of college (Criley, 1972, p. 8). This speculation has merit when one considers the recent Olympic results. In the 1964, 1968, and 1972 games the men's and women's teams placed 7th, and 9th, 7th, and 6th, and 10th, and 4th, respectively ("Special Olympic Report," 1965; "19th Olympiad," 1968; "Olympics: Women's Results," 1972; "Olympics: Men's Results," 1972). Moreover, the success of the club system in America is consistent with that of Russia's in terms of providing a base for competitive maturity as noted in the remarks of a reporter for the 1972 Women's European Championships. Haberland (1972) commented that:

the meet was brought to a close by three fine Russian girls 12 to 14 years old. Their routines would get 9.0 plus in my book. . . . the Russian program is not unlike our own (France). That is, one works first at the club level. . . . Young gymnasts train after school at their local club. Even for International meets, the bulk of the training is done at home. (pp. 16, 17)

Factors in the advancement of American gymnastics. All of the above aspects of gymnastics, that is, the various levels and types of programs and the evolution thereof, are seen as related to such factors

as clinics, research, international programs, the formation of various organizations, and the media, all of which appear to have exerted a significant effect in the advancement of the sport. Although these factors had been in effect earlier, they became more pronounced beginning with the 1960's (Sundby, 1969).

The National Gymnastic Clinic at Sarasota was a mecca for the gymnastics community for a number of years. A need was seen to hold a clinic in the western part of the country, and as a result, the Western Gymnastic Clinic was established in 1961 which in 1963 was jointly sponsored by the USGF and the University of Arizona in Tucson (Laptad, 1972). Shortly thereafter the USGF Eastern Clinic was established in 1965 at Fort Lauderdale, Florida as a needed counterpart to the Western Clinic (Bare, 1968). In addition to these National Clinics which were held during the Christmas recess, several regional clinics were established and have continued. An indication of the need and the impact made by these affairs is the report of the 1967 New England Clinic which is held during the Thanksgiving recess. The more than 1200 participants made it the best attended clinic in the country and prompted Jack Bechner, 1968 Olympic Team coach, to remark, "This was the finest educational clinic of its kind I have ever seen" (Massimo, 1968). Many other clinics are held currently around the country both during the holidays and throughout the summer in the form of camps and schools.

The importance of the need for research is reflected in a featured column in the Gymnast during the past decade. The presentations are a

compilation of the works in the physical education profession pertinent to gymnastics. The fact that many of these presentations are biomechanical-oriented indicates the influence of Cureton (1939) and McCloy (1937) both of whom pioneered in the research on the analysis of human motion. Scientific Principles of Coaching by Bunn (1955), which devotes a chapter to the analysis of gymnastics, includes an acknowledgment of McCloy for many of the principles noted in the text; the many research articles in The Modern Gymnast reflect the Cureton influence in that a good number of them were conducted at the University of Illinois and have been co-sponsored by him (Frederick, 1970). The value of research was also recognized by the NACGC which provides research awards annually.

More recently is the formation of the "Biomechanical Task Force," which was a result of the feeling that a concerted effort must be made by the gymnastics community to improve performance quality. This was stimulated by Gerald George (1972) who now heads up this program. The results are presented in the research section of the annual USGF Congress (USGF, 1973).

Coinciding with the expanded growth and interest in competitive gymnastics are the many competitions aside from regular league meets. The competitions are held, for the most part, during holidays and off-season. A large number of these, such as the international tours of the Japanese, Chinese, and Russians, are sponsored by the USGF in addition to the men's and women's USGF National Championships (Bare, 1972; Cumiskey & Thatcher, 1973; Expo '74, 1974).

With the continued evolution of gymnastics, the necessity of the formation of various organizations became apparent; the leadership needed to be helped. There are now such organizations as the National Gymnastics Judges Association (men) and the National Association of Women's Gymnastic Judges. Practically all the major gymnastics organizations in the country are affiliated with the USGF thus making for a more unified and continually improving sport.

There appears to be more public awareness of gymnastics as a result of media coverage. One official pointed out that many sections of the country were devoid of gymnastics programs until the sport was televised ("Femininity Test," 1974). The influence of television was particularly noted in the reporting of the 1972 Olympics which gave considerable coverage to the sport. The more recent 1974 tour of the Russian Men's and Women's Gymnastics Teams received much public acclaim through both press and T.V. (Expo '74). The lay public's knowledge of the sport has undoubtedly been enhanced through commentary by such experts as Muriel Grossfeld and Tom Maloney.

A very significant step in communication among members of the gymnastics community was the appearance of The Modern Gymnast magazine which began publication in 1956 through the efforts of Glenn Sundby (1956) who still continues as editor-publisher. It is now known as International Gymnast and has provided a much needed means for disseminating a wide array of information. Indicative of this publication's contribution "to the technical knowledge and general information of everyone in the sport," it became affiliated with the USGF in October, 1967 as its "Official Publication" (Bare, 1967, p. 7).

Current status and prospects of competitive gymnastics in America.

There appears to be more unity and definitely more activity within the gymnastics community with each passing year. Much of this has come about through the United States Gymnastics Federation and/or its affiliates, the major national gymnastics bodies, most of which have been mentioned in this section of the review. Moreover, the fact that all the major gymnastics organizations in the United States are now constituent members of the USGF, makes it truly an "organization of organizations" (Laptad, 1972). As such, it appears that the current status of the sport, which is one of growth in size and quality, is attributable to the USGF, the aims of which include the creation of:

a truly national (through regions) program that will enable talented and promising gymnasts to train systematically for national and international events. . . . "an administrative network of machinery that brings information, timely and accurate information, to coaches, teachers, and gymnasts in the field." (p. 107)

The accomplishment of these aims has been alluded to in several of the accounts discussed throughout this section of the review. It should be noted that the development of the USGF and its recognition by the F.I.G. (International Gymnastics Federation) as the controlling body for gymnastics in America (Laptad, 1972), is the result of a dispute between the A.A.U. and the USGF, the antecedents of which were disputes between the A.A.U. and the NCAA for a half century (Flath, 1964).

At present, a major concern of the gymnastics community is to make the United States Olympic Committee a more representative body, a view

shared with other sports. Although the USGF is the official sanctioning body for international gymnastics competition by virtue of its recognition by the F.I.G. as the official representative body for the United States, the USGF feels that the United States Olympic Committee as presently structured, is not conducive to producing the best efforts in the forthcoming Olympics. Moreover, this view is not held by the sport of gymnastics alone. A group of 21 individuals consisting of three world class athletes and representatives of 14 of America's major amateur sports organizations held a meeting on international amateur sports for the purpose of improving the administration of opportunities for teams and athletes representing the United States (Robinson, 1975). A result of this meeting was the drafting of "Principles for Action," a document comprised of statements including support for pending legislative action all of which aims at the reorganization of the USOC. A second major goal of the USGF is to exert its efforts toward eliminating the bias in judging which severely affected both the men's and women's teams at the World Games in Varna (Bare, 1974a, 1974b; Grossfeld and Wettstone, 1974).

The emphasis on the all-around, particularly at a young age and particularly on the part of boys' programs, appears to be a prime consideration toward improving gymnastics. The reasoning behind this is that international competition allows only for the all-around. Further, the six events in men's gymnastics compared to the four in women's gymnastics make for a more difficult indoctrination of boys to a complete gymnastics program. However, with longer exposure to the

all-around, American men would most likely be better prepared for international competition ("If You're Looking," 1974). There is some credence to this in considering the impact of the club program of the girls, most of which emphasize the all-around, coupled with the fact that the women's teams in both the 1972 Olympic and 1974 World Games placed considerably ahead of the men's teams.

A step in the direction toward the all-around has been taken in that the USGF National Championships adopted an "all-around only" format (Bare, 1968). It would seem that the next step would be to emphasize this concept at lower levels of boys' and men's competitions, a trend that perhaps is beginning as seen in the National High School Gymnastics All-Around Invitational. With all levels and aspects of gymnastics affiliated with the USGF, which allows for better articulation of the efforts of all, it does appear that gymnastics will continue to grow and improve as a competitive sport in America.

Summary. It was noted that the sport of gymnastics had its roots in the form of training systems referred to as "gymnastics" which became an integral part of education programs. Gymnastic type activity evolved into a sport form through the efforts of several dedicated leaders and was promulgated by fraternal societies such as the Turners, Sokols, and the YMCA. Sometime after gymnastics was introduced into the schools, it became more popular even as it continues to be promoted by the above mentioned societies.

Through a combination of factors, notably clinics, international programs, research, the formation of various organizations, and the

media, the sport of gymnastics was enhanced both in the quantity and quality of its competitions. The burgeoning independent clubs and the role of the United States Gymnastics Federation were viewed as positive factors in the future of the sport. The achievements due to both individuals and organizations alike, particularly with regard to the rapid rise of girls' and women's programs, make gymnastics a viable area for the study of sport motivation.

Women in Sports

With the impact of Title IX of the Omnibus Education Act of 1972, participation of girls and women in sport is beginning to be a regular, perhaps, common-place occurrence. This is not to say that in the past females consciously refrained from athletic pursuits. To the contrary, the visibility of the female in sport was more a matter of constraint than restraint. There is ample testimony to the involvement of women in sport.

Involvement of women in sports. History provides evidence that women have participated in sports for several thousand years. The most notable early encounters being the Heraea, beginning around 500 B.C. (Menke, 1953). This was women's answer to their exclusion from the ancient Olympiads spearheaded by a lady of Greece known as Hippodameia.

Early modern times reveal the penchant for sports by females but the accounts are predominantly about the upper class and nobility. Mary Queen of Scots is noted for playing golf and Anne, Queen of

England, for her involvement in horse racing, both during the 17th century. In the early 1800's in the United States, it was primarily the refined women who engaged in established sports which consisted of archery, croquet, lawn tennis, and later, golf (Menke, 1953).

Later times saw the emergence of female athletes who were noted for their outstanding accomplishments and/or their championship success. In swimming, Agnes Beckwith, a 14 year old English woman swam five miles of the Thames in 1875; Gertrude Ederle and Florence Chadwick, both of the United States, were the first women to swim the English Channel in 1926 and 1951 respectively, and later, Chadwick swam the channel both ways. Ragnhid Hveger of Denmark held all but one world record in free-style swimming; Helene Madison of the United States won 17 national championships and in 1932, two Olympic titles; and Ann Curtis, also of the United States, had 31 national championships and one Olympic title to her credit (Menke, 1953).

In golf, Glenna Collett Vare, the 1922 women's national champion, held six other national championships. Several other women with multiple national championships were Dorothy Campbell Hurd with titles in 1909, 1910, and 1924; Alexa Stirling Fraser with titles in 1916, 1919, and 1920; and Mildred (Babe) Didrikson Zaharias, who became an outstanding amateur and later, professional golfer after an outstanding career as one of America's most accomplished athletes (Menke, 1953).

Outstanding women during this period in track and field include Blankers-Koen of the Netherlands who was an Olympic champion in four events in 1948, won three events in the 1950 European championships and

at one time held the world and European records for two field and four running events. In skiing, two women of note are Gretchen Fraser who became the first American to win an Olympic medal by taking second place in the 1948 Olympics; and Andrea Mead Lawrence, also of the United States, who, in winning the slalom and giant slalom in the 1952 Olympics, became the first woman of any country to win two gold medals in skiing in one Olympiad. In skating, Sonja Henie of the Netherlands who won the Olympic title in 1936 and who later became a professional success, was one of the most popular of accomplished women athletes during this period (Menke, 1953).

Considered as the most popular women athletes in modern times from the point of view of outstanding accomplishment and in leading the cause for a legitimate place in competitive sports for women were Eleonora Sears and Mildred Didrikson Zaharias. During the first three decades of the 1900's, Sears participated with exceptional skill in tennis, golf, canoeing, riflery, swimming, horseback riding, and most notably, long distance walking which she commenced after the age of 40. Zaharias was an excellent general athlete both in amateur and professional sports. So accomplished was she that according to an account by Menke (1953) she won 632 of the 634 contests she entered. The two "defeats" were as a member of a basketball team that placed second in a tournament during the 1932 Olympic Games and a world record high jump using the "Texas roll" which disqualified her.

In recent times, many more women were visible. Among these are Wilma Rudolph, Micky Wright, Billie Jean King, Pat McCormick, Cathy

Rigby, Dawn Fraser, Robin Smith, Donna deVarona, Janet Lynn, Larissa Latynina, to name but a few.

Despite the achievements of these women, their accomplishments have been looked upon as rarities and novel occurrences. Participation was often at the expense of social sanctions, for it was not an accepted pattern for women to participate in organized sport. Attesting to this attitude is the disparity between the number of men and women participants. Stone (1958) indicated that up to 1950 only 540 women accounted for the 10,230 professional athletes. More women and girls are participating in sports today due to the reduction of social forces which had fettered them.

Forces restraining female sports participation. The prevailing force inhibiting equitable opportunities for the female in sport has been society imposed, based on the role expectations for the female. As indicated above, women athletes, particularly in the early modern times, participated in sport knowing they were defying social convention. Women were even excluded from the ancient Olympic games as mere spectators.

The literature is replete with references to society's opposition to women's sport participation. Many arguments were and still are offered as to why women should not participate at all or only do so in a restrictive manner. Krawczyk (1973) maintained that despite the arguments against sport being improper for women being based on physiological factors, the real argument narrows down to a moral imperative related to customs which has no supportive basis. She cites the aims

of the First Polish Congress for Women's Sport which are reminiscent of the "socially approved list of sports for women" which Metheny (1965) suggested. Both publications analysed that sports for women were suitable if they stressed the aesthetic form of motor activity, and de-emphasized force and body contact.

The same sentiment was expressed by Gerber (1971) in a brief historical discourse on sport competition for women and also by Hellison (1973) in discussing the reduction of full participation in competitive sport by women as a result of cultural expectations. Moreover, these general contentions are supported by research such as that by Malumphy (1968). Among other findings, Malumphy noted that femininity and dating prospects were enhanced by engaging in individual sports whereas participation in team sports was a negative, if at best, an uncertain contribution to the woman's personality. To contradict these views which she considered illogical, Krawczyk maintained that:

Social tolerance regarding women practicing sport depends on education which neutralizes opposition and breaks through the traditional ideas and stereotypes, related to the social role of women, thus contributing to a unification of the social and moral patterns for both sexes. (p. 59)

It is of interest to note that role expectations regarding sport for the female imposed by society are also reflected in the n Ach research on women. McClelland and his associates (1953) showed that women's n Ach is linked with "social acceptability" whereas men's n Ach is associated with "leadership capacity and intelligence" (p. 181). The work of Lesser et al. (1963) corroborated this view and in addition

showed that female achievers yielded higher n Ach scores in response to achievement-oriented TAT cards depicting females but not males, whereas female underachievers increased significantly in achievement-oriented conditions depicting males but not females. The last factor was similarly revealed in the work of French and Lesser (1964). They found that their female subjects had higher n Ach scores upon responding to male figures under intellectual arousal and to female figures under women's role arousal.

Horner (1972) developed the concept of motivation to avoid success which she identified as an internal psychological reflection of a societal stereotype that views competence, independence, competition, and intellectual achievement as factors which are basically inconsistent with femininity. Horner contended that this fear of success inhibited the performance and level of aspiration of the female and is a latent, stable personality disposition acquired during childhood in concert with standards of sex role identity. Although Horner's view is disputed by Robbins and Robbins (1973) and by Tresemer (1974), her work does point to the culturally imposed role expectations of the sexes. Namely, that in American society, while competitiveness is valued in the male, it is deemed undesirable for the female.

A series of articles in Sports Illustrated by Gilbert and Williamson (1973a, 1973b, 1973c) disclosed the inequities with regard to women's sports. In their first article, Gilbert and Williamson (1973a) discussed the disparities between men's and women's programs in schools and colleges in terms of funds, facilities,

instructional personnel, time allotments, and awards. Each of the factors favor the male programs. They also revealed the chauvinistic attitude which prevails among most men regarding the participation of women in sport. Also revealed in their reporting was the paucity and the peculiarity of news coverage of girl's and women's sports. Invariably, more space is devoted to males if a male and female event occur at the same time, and write-ups of girl's and women's events are couched in terms that are peripheral to their performance, emphasizing such things as hair styles, physiques, marital status, and motherhood. This last point is similar to that expressed by Abinanti (1971). She claimed that whenever men sports writers felt inclined to include women in the sports news, they have done so in a manner that tends to erode the values of men's sports while creating a mockery of women's sports.

In their second installment, Gilbert and Williamson (June 4, 1973) reported on the arguments against women's participation in sport which infer that women are physiologically inferior; that sports are detrimental to the health and femininity of the female; and that insufficient skill and interest prevail among girls and women. These arguments are disproven by research and are mainly used as a pretext to exclude or curtail females from competitive sport experiences.

The results reported by Gilbert and Williamson bear a striking resemblance to those reported by Ulrich (1960) regarding the anatomical, physiological, and psychosocial differences between men and women.

She concluded that differences are possibly greater within than between the sexes but indicates that the degree of difference does not warrant exclusion or restriction of sport activity for women. Further, she suggested that the culture is as decisive a factor as any for determining women's activity. Her writing was echoed by Cheska (1970) a decade later. Interestingly, these points provide a basis for the guidelines set forth and followed by the Association of Intercollegiate Athletics for Women (AIAW).

The most recent attempt to thwart the efforts of girls' and women's equitable share in sports participation came on the heels of the passage of Title IX which prohibits discrimination on the basis of sex in educational programs (e.g., sports) at institutions which receive federal aid. The NCAA rejected recommendations of its committee on women's sport and on April 28, the NCAA Council proposed a plan which would assume major governance of women's intercollegiate athletics at the national level. A letter from the AAHPER Executive Committee (Wiley et al., 1975) urged its members to support the rejection of the NCAA proposal because it was firmly believed that it would deter, rather than aid the efforts of the A.I.A.W.

Opportunities for women in sport have not had the universal support of all women. The prudish convictions of Lou Henry Hoover led to a commission which she headed in 1923 to investigate the practice of basketball double headers involving girls. The commission advised that the practice be stopped. This edict, applied countrywide, created a domino effect. The decline in women's basketball caused

cycling, baseball, and track/field, which were also popular, to decline as well (Gilbert and Williamson, 1973a).

Nor was the cause of the female athlete helped by some women physical educators in the early 1900's. A study by Mabel Lee (1931), inquiring into the opinions of women physical educators concerning intercollegiate competition for women, indicated a prevailing view that sports participation should be low-key. The results of her questionnaire showed that less than half of one percent of the girls in the 98 colleges polled participated in competitive varsity sports.

For a long time, women in the professional ranks of physical education dissatisfied with the trend of men's sport, particularly in education (athletic scholarships, business-entertainment orientation), clung to play-day and other low-key sports events. Indicative of this sentiment is a view stated recently by Charlotte Lambert (1969), head of the Department of Physical Education for Women at Oregon State University. Lambert's pleas for a "middle road" approach appear to discourage highly competitive women's athletic programs.

Whether the women physical educators succumbed to the prevailing social customs pertaining to girls' and women's sports is conjecture. Nevertheless, the net effect of low-key sports programming was the unfulfilled athletic abilities and ambitions of many school girls. The view of women physical educators has altered greatly and they are now decidedly in favor of and highly concerned about competitive sports for girls and women. Inherent in altering this view has been the effect of numerous research, writings, and symposia typical of which are the

publications of Harris (1972, 1975), Neal (1966), and Snyder and Kivlin (1975), which show, for the most part, that males and females are more alike than different (e.g., human) with regard to their interest and performance in sports.

Concern for female sports participation. Concern for an equal opportunity for girls and women to participate and compete in sports is noted by individuals as well as organizations. This concern has been expressed for a long time.

With regard to the sport scene of the 19th and 20th centuries, in the United States, Dulles (1963) provided accounts of the interest and activity of women in sports such as croquet, skating, archery, lawn tennis, fencing and swimming. Women were admonished, however, to participate with caution so as not to become fatigued and to maintain their aura of femininity. So great was the interest in bicycling according to Boyle (1963) that women's participation in this past-time led to their emancipation from long dresses and a sedentary existence.

At present, women's intercollegiate athletics is overseen by the Association of Intercollegiate Athletics for Women (AIAW) which was formed in 1971. It is a component of the National Association for Girls and Women in Sport (NAGWS) and is responsible to AAHPER. Certain developments within these organizations concerning the status of women's sport are of consequence. In 1929, the Women's Division of the National Amateur Athletic Federation passed a resolution which disapproved of competition for girls and women in the Olympic games. The resolution was adopted by the NAGWS, then known as the National

Section of Women's Athletics (NSWA). This act along with the action precipitated by Hoover's commission as mentioned previously, was most likely responsible for the decline in women's intercollegiate sports with their programs reverting to a play-day orientation.

The first National Institute on Girls' Sports was held in 1963 at the University of Oklahoma. Its purpose was "to increase the depth of experience and expand opportunities for girls and women in sports" (Jernigan, 1965, p. 4). It proposed to do this through a series of workshops involving experts (men and women) in various sports. The seriousness of its purpose is reflected in the comments of Kathryn Ley (1965) who said that her

major concern is that every girl in this country benefit from participation in sports, that every girl receive instruction and coaching in a wide variety of activities, that any girl who has the desire and ability be provided with opportunities to excel in a sport and become a champion. (p. 12)

This same devotion to purpose was reflected in subsequent institutes. For example, in the second institute, Ley (1966), taking note that the major outlet for highly skilled girl athletes had been with non-school teams such as clubs and AAU meets, admonished her colleagues to increase high school programs. Further, she called for more leadership at the college level from the Division on Girls' and Women's Sport (DGWS) in terms of expanding programs and by increasing cooperation with other sports organizations. An indication of this desire was in a description of the DGWS liaison status by Mildren Barnes (1972) showing that the DGWS, through its representatives, was involved with fifteen sports organizations within and outside the field of education.

A significant step was taken in 1967 with the formation of the Commission on Intercollegiate Athletics for Women (CIAW). It was proposed in 1965 as a part of the DGWS for the purpose of establishing guidelines for intercollegiate competition for women (DGWS, 1967). The concern for high level competitive sports experiences resulted in regular intercollegiate competition. The CIAW took the responsibility for holding national championships in golf, gymnastics, track and field, badminton, swimming and diving, volleyball, and basketball (Magnusson, 1972). However, with the surge of interest and growth in women's intercollegiate sports, there developed a need for a more highly structured governing body. The CIAW thus evolved into the Association of Intercollegiate Athletics for Women (AIAW) in 1971. In addition to establishing and refining guidelines, the AIAW assumed direct control for national collegiate championships for women.

In the wake of the formation of the AIAW emerged the Higher Education Act of 1972 with its highly volatile Title IX. Much concern was generated with regard to the viability of women's intercollegiate athletics. The Delegate Assembly of the AIAW was held in 1973 during which the adoption of a constitution was formalized. The main issues revolved about scholarship aid and separate teams for men and women (Hult, 1974). This concern, in part, emanated from the philosophical position of the DGWS. Although this body promoted the promulgation of girl's and women's sports from the early 1940's, its guidelines were tinged with a philosophy that "girls should be protected from competitive sports that might overtax them physically or expose them to undesirable social experiences" (Blaufarb, 1974, no page).

The cause for women's sports gained more solidarity and strength as the leadership, coupled with the legal force of Title IX, asserted itself more and more convincingly. The DGWS published a position paper detailing its convictions (DGWS, 1974). In April of 1974 a conference entitled "Title IX Target 1979 Ending Discrimination in Health, Physical Education, Recreation, and Dance" was held at the University of Maryland. The far reaching implications of the legislation was delineated. Of particular note was the concern expressed about women's sport in a sub-section specifying the determinants for equity (Sandler et al., 1974) which, for the most part, was consistent with the tenets of the AIAW.

In addition to the support and concern for girls' and women's sport, expressed by organizations, are the sentiments held by various individuals. In an article in Swimming World, Richard Brown (1965), swim coach at North High School, Bakersfield, California, lauded the swim programs in his area which gave equal emphasis to boys and girls. He emphasized that the fears of an apprehensive public concerning behavioral problems resulting from mixed practices and team trips were unfounded. He decried the paucity of girls' high school swim programs, country-wide, and spoke out for such programs. He concluded by noting that swimming must be good for girls if it is also good for boys. Furthermore, he emphasized that arguments about loss of femininity and the development of masculine-type physiques can be dispelled merely by observation of the girls in the program as well as women Olympians.

Reger (1967), writing in School Activities on the exaggeration of physiological and sociological factors as a deterrent to girls' and women's sports, maintained that women should be educated through the medium of competitive sports; that values derived from competitive sports are not acquired through other educational offerings.

In reporting on the AIAW national track and field championships, Gilbert (1973) indicated that the low qualifying standards are a function of the educational system which has shown proportionately more interest for men's sports than women's. He cited the feelings of Bert Lyle, coach of the Texas Women's University team which won the meet:

You don't get better unless you go up against the best. If the colleges decide to put the money and effort into women's track that they do into men's, why then the sport and this meet will be first class. (p. 98)

In the first of a three part series, Gilbert and Williamson (1973a), discussed what they termed the "psychological warfare" waged against women athletes as perhaps the most harmful of the discriminatory factors. They cited the efforts of Jack Griffen who, over a period of 25 years, has coached both sexes from age-group to Olympic level sports. They related his feelings which show that in addition to enjoying coaching both sexes, he is impressed with the intangible quality of desire: "Any girl or woman who is very much involved in athletics tends to have an extraordinary amount of desire, not only to excel in her sport but to excel as a person" (p. 98).

In their third and last installment, Gilbert and Williamson (1973c) cited the viewpoint of James Bergene, high school principal in Great

Falls, Montana, who felt that his \$15,000 girls' program needed to be upgraded:

If athletics have a place in education, then they are as important for girls as well as boys. . . . Any principal who is willing to support a strong boys' athletic program and is content to have a weak girls' one has no business calling himself an educator. (p. 66)

Similar notions were indicated in the same article by Jack Manley, director of athletics at Catonsville Community College in Maryland. His feelings of equity are reflected in his program which shows parity in sports offered, coaches' salary, budget and procedures.

Another school administrator's view on this subject is that of Ewald Nyquist (1973), New York State Commissioner of Education. In his address to the National Federation of State High School Associations on the subject of equity in athletics, he stated: "No sports program today should be tolerated if it continues to short-change girls" (no page). He espoused the right for equality in boys' and girls' programs because he believes "athletics teaches a sense of excellence" and "excellence is applicable to both sexes" (no page). In specifying his views on athletics, he also outlined the measures taken by New York State which involved upgrading and equity in athletics. Although mixed competition in New York is conducted only in non-contact sports and only if there is no provision for a boys' or a girls' team, the results of an experiment involving boys and girls combined in non-contact sports are of interest: 1) 84 percent of boy team members would have girls on their teams, 2) 99 percent of the girls would want to be on a boys' team again, 3) 93 percent of the parents recommended that

highly skilled girls be allowed on boys' varsity teams, 4) 86 percent of the participating coaches would have a girl on their team, 5) 74 percent of the opposing coaches would want a girl on their team if she could qualify.

Mimi Murray (1974), highly successful women's gymnastics coach at Springfield College, in discussing her experiences, contends that women are involved in sport because they are eager to excel. Further, she suggested that this is reflected in women athletes being highly dedicated and self-directed. Murray desires "to have the women's programs understood and accepted. . . . Just as men and women have opportunities to excel in all other endeavors, now may our sportswomen be . . . challenged . . . in athletics, too" (p. 66)!

Popularity and quality of girls' and women's sports. Women's competitive sport programs have flourished in certain parts of the country. The growth in the programs, albeit a result of legislative mandate, is indicative of the interest on the part of girls and women in competitive sports.

Within a period of six years (1962-1967), girls' interscholastics track and field in Iowa had grown from 1,500 to 18,000 participants with up to 3,000 spectators viewing a track meet (Cooley, 1967). E. Wayne Cooley, executive secretary of the Iowa Girls' High School Athletic Union, contended that performances approach national and international records and showed a table of comparative statistics indicating this (e.g., 10.9 seconds for the 100 yard dash, 2:12.0 for the 880 yard dash, and 18' 5" for the long jump). Popularity and quality

of performance was evidenced by newspaper, radio and television coverage. Yearly increases in the women's maximum running distances attest to the interest and demands of the participants for challenge. One hundred and ten yards was the longest distance run in 1962; by 1966 a distance run of one and a quarter miles was incorporated upon request. Further indication of desire, according to Cooley, is the practice of the girls running throughout the winter and the summer, training before the school day in order to get a double workout, and competing in track and field meets as well as attending clinics in and out of state.

A similar situation appeared prevalent in Britain. Levenson (1972) reported on the prospects of the British national school girls' cross country championships involving competition in three distances, 2.5 km., 2.8 km., and 3.0 km. He cited some individual feats such as one girl entered, who also competed in track in which she ran the 800 meters in 2:10.1, a "world best for a girl of 13 and is faster than most non-athletic males could go twice around the track" (p. 13).

An article a year later by Cooley (1968) depicted a similar picture for basketball, the most popular sport in the Iowa Girls' High School Athletic Union, which involved 22,000 girls in 1968. The state championship attracted 14,000 spectators and was covered by all media including Sports Illustrated. Indicative of the quality of skill were the two finalist girls' teams which combined made 44 of 49 free throws for a percentage of 90, much better than the less than 80 percent in the NCAA championships. Cooley felt that the success of basketball, which began in 1951, was responsible for a broader athletic program.

By 1968, girls were competing in softball, golf, tennis, track, and swimming.

The Iowa program is now over 20 years old and indications of its continual growth in scope and quality were detailed in an account by Gilbert and Williamson (1973b). Four hundred eighty-eight high schools belong to the association which sanctions 17 championships in 13 different sports. The number of schools currently participating is indicated as follows:

- | | |
|--------------------------|-------------------------------|
| 1) Basketball - 438 | 8) Volleyball - 65 |
| 2) Track - 423 | 9) Gymnastics - 49 |
| 3) Softball - 302 | 10) Swimming - 46 |
| 4) Golf - 247 | 11) Co-ed Tennis - 26 |
| 5) Tennis - 86 | 12) Synchronized Swimming - 9 |
| 6) Distance Running - 12 | 13) Field Hockey - 6 |
| 7) Co-ed Golf - 77 | |

Most of the coaches are men and are paid exactly the same as coaches of boys' teams. All other aspects of the program, such as time, equipment, facilities, travel, are given equal opportunities with the boys. According to Williamson and Gilbert, Cooley is responsible for the program and its success which until he came was "the same as elsewhere --that is, bad and unequal" (p. 50). The scope of the program lends itself to financial success as well. The Association's \$600,000 annual budget, principle source of revenue, is state championship gate receipts.

Other programs, more recent in development than the Iowa one reported by Gilbert and Williamson (1973b), included some in other parts of the country. The Tampa Recreation Department (Hillsborough County, Florida), in response to inquiries of competitive sports for girls,

organized a slow-pitch girls' softball program in 1971 which attracted 1,000 entries who made up 68 teams. Surprised at the response, officials started basketball programs in 1972 and planned to include an older age division for softball.

A golf clinic in Baltimore, organized by Carol Mann, a leading member of the LPGA, attracted 154 girls contrasted to the 30 to 40 she was told that could be expected.

Three hundred girls responded to a Junior Gloves boxing program in Dallas. This exceeded the number of boys that had ever participated in the same program.

As a result of a series of legal challenges in Kansas, several regional and state championship sport events were set up in 1972. These involved 14,000 girls in four regional track meets, 900 girls from 91 schools in the state tennis tournament, and 4,000 girls participated in volley ball.

Soccer leagues established in 1971 in California attracted 2,000 girls. This increased to 6,000 in 1973 with a projected increase of 30 percent for the fall of 1974 (Gilbert and Williamson, 1974).

With respect to the concern shown by the lay public regarding women's sports, a study of tennis spectators (Geist et al., 1971) revealed no overwhelming difference in the spectators' preference for male or female competition. A majority of the spectators, 42 and 53 percent for men and women respectively, felt that as many women as men should play, while male and female spectators alike, preferred women's singles over men's doubles competition.

Indicative of the serious intent and capability of women in rowing is the fact that the sport doubled in participation within three years (Kelly, 1974). In less than three years, the Eastern Association of Women's Rowing Colleges (E.A.W.R.C.) grew from 10 to 18 members, with five more intending to join in the spring of 1975. Reflecting the quality of performance was the fact that a college team, the University of Washington, won the National Women's Rowing Association Championship Regatta in 1970 which hitherto had been won only by club teams. In 1973, college teams placed first, third, fourth, and sixth in the eight-oared event. Further evidence of interest and growth was the inclusion of six championship events in 1974 compared to two in 1973.

Typical of the quality of a college women's athletic program is the one sponsored by Springfield College (Mass.). A twelve year record (1963-1975) showed a composite win average of .809 for seven teams which won three national championships, a second, third, fourth, sixth, and ninth nationally, plus six Eastern Championships. One of these teams, gymnastics, won 49 and lost 2 meets in ten years for a .960 percentage, which included the three national championships and five of the Eastern championships (Lynch, 1975).

Phenomenal growth has occurred in women's athletics in the past two years, primarily as a result of the implications of Title IX. The number of girls and women coming out for athletic teams indicates their desire to engage in competitive sports. In a follow-up article to their 1973 series, Gilbert and Williamson (1974) reported that colleges and universities nationwide have responded to the interest for women's

sport with dispatch. Increases are noted in budgets, number of sports offered, and facilities. In some cases, they are dramatic; e.g., the University of Washington provided a \$200,000 budget for 1974-75 compared to its women's budget of \$18,000 for 1973-74. In addition, the University added a new wing to its athletic facility which will cost between \$1 and \$2 million and will help provide facilities for women.

Other signs of the presence of the female athlete has been the increase in prize money for professional sports and the appearance of women athletes in T. V. and radio commercials.

An indication of the growth in girls' athletics, however, is best revealed in the 9th Sports Participation Survey provided by the National Federation of State High School Associations. By 1973, there were 26 sports offered, 14 of which showed increases in participation, while 3 new activities were added for the 1974-75 school year (Fagan, 1974). Participation growth from 1971 to 1973 was over 530,000 while the increase from 1973 to 1974 was over 480,000. Thus, over an additional 1,000,000 girls responded to sports programs from 1971 to 1974 in the nation's high schools.

The Olympic Games in Munich in 1972 involved 1,070 females compared to six at the games in Paris in 1900 when women were admitted for the first time ("Femininity Test," 1974). In collegiate competition, a survey by the NCAA (1974) taken in 1971-72 showed that women's participation more than doubled since the 1966-67 survey. The largest increase took place in basketball, tennis, volleyball, and field hockey, while marked increases were shown in gymnastics, softball, and swimming.

Throughout 663 institutions, 31,852 women participated in 19 different sports. Although the more than 50 percent increase by the women exceeded the 11.8 percent of the men, 24 different men's sports involved over 170,000 participants.

One now notes the emergence of women directors of athletics. Typifying the approach of these administrators is that of Vivian Barfield, the first woman assistant athletic director (men and women) at the University of Massachusetts: "I expect to work toward the goal of bringing athletic programs for men and women into greater harmony, thereby providing the equality of opportunity women demand and maintaining a high level of men's athletics" (Abel, 1975, p. 19).

Summary. A review of the literature concerning girls and women in sport revealed that they seek sport experiences. The disparity in the number of participants and programs between males and females was caused principally from what Margarete Streicher referred to as the 3 "K's," namely that women exist for Kinder, Kuche, and Kirche (Zeigler, 1973). The concept that the woman's role should be relegated to "children, kitchen, and the church" was exposed as a cultural expectation. Girls and women have given convincing evidence that they, like boys and men, have an interest in and a capacity for self-mastery in sports.

N Ach Theory

In discussing n Ach, it is important to remember that it is but one aspect of motivation which in itself is a complex phenomenon. Motivation is considered a determinant of human activity arising from either one or a combination of factors. As to the definition and precise nature of this determinant, no unanimity exists. In conceptualizing motivation, the idea postulated by Young, Hebb, Murphy, and Atkinson as cited in Cofer and Appley (1964, pp. 7-8) are cogent. Motivation may be defined, or if one prefers, conceived of, as a behavior regulating process induced by an internal or external source which creates an arousal such that the behavior is directed toward a specific goal or set of goals.

Although motivation is variously defined, there is much more variation in the theoretical orientations concerning its source. As such, the nature of motivation is complex and difficult to ascertain. A great many sources of motivation lie in a biological heritage. These would include instinct, activity and exploration, homeostasis, and bodily drives such as hunger, thirst, and sex. Other sources for one's motivations are believed to lie in hedonism, psychological states such as conflict, frustration and stress, and in learned behavior as a result of the notions of drive and reinforcement. Each of the above sources have their limitations, however, since there is no unanimity that a single source can account for all behavior or that, as Peters (1969) concluded, all behavior is motivated.

A distinction must be made between the terms "motivation" and "motive" because each has a specific connotation. While the term "motivation" refers to an energized state, the term "motive" classifies the energized state and refers to a specific behavioral disposition. For example, Atkinson (1964) in discussing n Ach, stated: "The term motive is used in reference to a relatively general and stable personality disposition which is assumed to be one of the determinants of motivation, the tendency to strive for the goal" (pp. 263-64). Hence, we speak in terms of the "power motive," the "affiliation motive," the "achievement motive (n Ach)," and the like.

According to Heckhausen (1967), the beginnings of inquiry into the area of achievement motivation (n Ach) dates from the work of two pioneers in German psychology, that of Narziss Ach who in 1910 utilized the concept of "determining tendency" to explain the achievement-related behavior of his subjects and Lewin who in 1926 employed the concept of "quasi-need." Neither Ach nor Lewin did any research, however, in the specific domain of n Ach. Actual experimentation began with H. A. Murray's (1938) analysis and assessment of personality as reported in his 1938 volume, Explorations In Personality.

The concept of the need to achieve or achievement motivation derives from but one of a dynamic system of basic needs which formed the core of Murray's (1938) concept of personality. He viewed a need as

a concept (a convenient fiction or hypothetical consent) which stands for a force (the physio-chemical nature of which is unknown) in the brain region, a force which organizes perception, apperception, intellection, conation

and action in such a way as to transform in a certain direction an existing, unsatisfying situation. (pp. 123-24)

Murray (1938) distinguished between needs as being viscerogenic (primary) which included air, water, food, sex, lactation, urination and defecation, and those that were psychogenic (secondary) which incorporated twenty-eight kinds, one of which is the need to achieve. He conceived of the n Ach as an expressed desire for both accomplishment and prestige. For Murray, n Ach in terms of "desires" was:

To accomplish something difficult: To master . . . ;
To do this as rapidly, and independently as possible;
To overcome obstacles and attain a high standard;
. . . ; To increase self-regard by the successful exercise of talent. (p. 164)

In terms of "actions," n Ach was:

To make intense, prolonged and repeated efforts to accomplish something difficult; . . . ; To have the determination to win; . . . ; To be stimulated to excel by the presence of others, to enjoy competition; (p. 164)

A major contribution of Murray was the Thematic Apperception Test (TAT) which he devised to test for the psychogenic needs. It can be considered major from two points of view. On the one hand, it served as an assessment device which has been used extensively in the behavioral sciences, while on the other hand, McClelland's dissatisfaction with the manner in which it was used led him to investigate the phenomenon of n Ach.

McClelland was quite dissatisfied with the lack of experimental evidence involving humans and secondary drives. His early work, therefore, centered around developing a method of measuring n Ach. His efforts produced the n Ach score which is considered by Heckhausen (1967)

as a "breakthrough" since it generated much research in the field of human motivation. The paucity of evidence to support the interpretations of TAT testing had led McClelland to revise the testing procedure.

The essential difference between the use of the TAT as developed and used by Murray and that employed by McClelland is that the former made assessments of the subjects' protocols while the latter derived his assessments of the fantasy protocols on the basis of manipulating the experimental variable, namely, *n Ach*. The efforts of McClelland and his associates (1953) centered on an "attempt to arouse and control the intensity of a human motive and to measure its effect on imagination or fantasy" (p. 3). The results of these efforts are chronicled in their 1953 volume and detail the effects of various arousal conditions (particularly those of ego-involvement and experimentally induced conditions of success and failure) on imaginative behavior. In addition, their results illustrate how they derived their measure of *n Ach* and show how *n Ach* relates to other forms of behavior.

The procedure for administering the TAT is quite standard. It consists of the subject viewing four to six pictures depicting the psychogenic need being measured. In the case of *n Ach*, the pictures denote an achievement-oriented setting. After viewing each picture for twenty seconds the subject is asked to tell a story centering around four questions in which a minute is allotted per question:

1. What is happening? Who are the persons?
2. What has led up to this situation? That is what has happened in the past?
3. What is being thought? What is wanted? By whom?

4. What will happen? What will be done?
(McClelland et al., 1953, p. 98)

As previously mentioned, McClelland felt that the interpretations of the TAT protocols were deficient in that evidence was lacking to support the interpretations. As a result, McClelland along with Atkinson in 1948, adapted the procedure, and in addition, a year later with his associates, introduced varied experimental conditions.

The adaptation consisted of projecting the pictures on a screen for the purpose of a group presentation with the stories written rather than told to the investigator. The experimental conditions involved the manipulation of the n Ach setting in an attempt to obtain a more precise measure of n Ach. This was accomplished by situating the subjects in one of six experimental conditions designed to "presumably raise or lower the intensity of inferred need for achievement" (Atkinson, 1964, p. 225). These experimental conditions were 1) relaxed condition, 2) neutral condition, 3) achievement-oriented condition, 4) success condition, 5) failure condition, and 6) success-failure condition.

The subject's responses are content analysed for achievement orientation. The responses are rated on a continuum ranging from "Achievement Imagery" through "Doubtful Achievement Imagery" to "Unrelated Imagery" with scores of + 1, 0, and -1 respectively for each story. The algebraic sum of the scores for the stories is the subject's n Ach score. The main criterion for determining whether n Ach is reflected in the statements is inference to a long-term achievement goal or "competition with a standard of excellence," a

concept which served as the "generic definition" of n Ach for McClelland and his associates (1953, p. 111).

The efforts of McClelland and his associates (1953) toward refining the method of measuring n Ach was an attempt "to understand the manner in which a motive is acquired" (p. 7). To this end they considered the antecedent conditions likely for motive formation and having found them, concluded that motives were based on affective arousal. The antecedent conditions for arousing affect included a complex interrelation of adaptation level, perceptual expectations, and cognitive discrepancies (pp. 42-67). They contended that motives develop out of repeated affective experiences which are learned. Their approach, therefore, posited that "A motive is the learned result of pairing cues with affect or the conditions which produce affect" (p. 68). Moreover, this contention held that motives have their origins in early childhood experiences (McClelland et al., 1953; Heckenhausen, 1967; and Winterbottom, 1958).

Investigations following the principles laid down by McClelland led to further inquiry, namely the relation of individual differences in the TAT scores of n Ach under various experimental conditions. These studies indicated that the strength of the tendency to achieve as expressed in performing a specific activity in a specific situation appeared to be determined by both the personality disposition (achievement motive) and the immediate environmental influences. In this connection, Atkinson (1964) contended that such studies as reviewed in The Achievement Motive (McClelland et al., 1953) raised questions of

important theoretical interest:

Did a high n Achievement score imply that a person was chronically motivated to perform well no matter what the task and situation at the time of performance? Or were n Achievement scores to be taken as measures of individual differences in a disposition which would be overtly expressed only under certain conditions? If so, what was the nature of the conditions which would activate or arouse the achievement motive. (Atkinson, 1964, p. 232)

Additional linkage in the development of the n Ach theory appeared to be the variables of incentive value (I_S) and expectancy of success (P_S) both of which are interrelated. The clues for these variables were provided by an experiment repeated by McClelland (1956). It was an experiment to ascertain whether a relationship existed between the willingness to take risks and a measure of strength of achievement motive in young children. The task involved a ring toss at a peg in which the results showed that children judged to be strong in achievement motive tended to take more shots from intermediate distances from the peg than did children presumed to be weak in achievement motive. This served as a stimulus for Atkinson to consider the two variables (P_S and I_S) which he incorporated into a theory of achievement motivation proposed in 1957 (Atkinson, 1964).

Atkinson's incorporation of the I_S and P_S variables embodied the concept of expectancy espoused by Rotter (1954) and Tolman (1955), had much in common with the concept of aspiration level advanced by Lewin and his associates (1944), and took into consideration the "intervening variables" Hull (1943) proposed in his behavior theory regarding stimulus-response. So, in addition to the manipulation of the experimental variable of n Ach, the matter of situational determinants loomed

important in arriving at an n Ach score. The inquiry into the nature of n Ach gained momentum as Atkinson's attempts at refining the theory were set into motion.

Atkinson's theory, like that of Heckhausen's (1967), reflected the same view as McClelland's regarding the interrelationship of the person and environment. Atkinson went further, however, and postulated a dual tendency system in which each tendency involved a triumvirate of interrelated determinants. Atkinson (1964) proposed that in an achievement setting a person is confronted with 1) a desire to succeed and 2) a desire to avoid failure. A complex process is involved which is best illustrated by an overall summary of the theory offered by Atkinson and Feather (1966).

The theory of achievement motivation is one of a class of theories which attribute the strength of a tendency to undertake some activity to [with] the cognitive expectation (or belief) that the activity will produce a certain consequence and the attractiveness (or value) of the consequence to [for] the individual. The theory refers, specifically, to a very important but limited domain of behavior, namely, achievement-oriented activity. Achievement-oriented activity is . . . undertaken by an individual with the expectation that his performance will be evaluated in terms of some standard of excellence. It is presumed that any situation which presents a challenge to achieve, by assuming an expectancy that action will lead to success, must also pose the threat of failure by arousing an expectancy that action may lead to failure. Thus achievement-oriented activity is always influenced by the resultant of a conflict between two opposed tendencies, the tendency to achieve success and the tendency to avoid failure. (p. 328)

Atkinson and Feather (1966) decided to substitute the term "tendency" for the term "motivation" for the purpose of clarification and therefore, no change in the meaning of motivation is implied. In this regard, the term "tendency" refers to the product of motive,

expectancy, and incentive--the three situational determinants involved in either of the two tendencies: achieve success; avoid failure. The three variables that Atkinson considers to account for "how individual differences in the strength of achievement-related motives influence behavior in competitive achievement situation" (Atkinson and Feather, 1966, p. 12) are defined as follows:

1) An expectancy is a cognitive anticipation, usually aroused by cues in a situation, that performance of some act will be followed by a particular consequence.

2) The incentive variable . . . represents the relative attractiveness of a specific goal that is offered in a situation, or the relative unattractiveness of an event that might occur as a consequence of some act.

3) A motive is conceived as a disposition to strive for a certain kind of satisfaction . . . in the attainment of a certain class of incentives . . . such as achievement, affiliation, power . . . (Atkinson and Feather, 1966, pp. 12, 13)

The tendency to achieve success (T_s) is viewed as a "multiplicative function of the motive or need to achieve success (M_s), the strength of expectancy (or subjective probability) that success will be the consequence of a particular activity (P_s), and the incentive value of success at that particular activity (I_s)" (Atkinson and Feather, 1966, p. 328). Algebraically, the assertion is made that $T_s = M_s \times P_s \times I_s$. A parallel is seen in the tendency to avoid failure ($T-f$) in that "The motive to avoid failure (M_{af}) combines multiplicatively with the expectancy of failure (P_f) and the incentive value of failure (I_f)" (Atkinson and Feather, 1966, p. 331). The algebraic analog of this function is $T-f = M_{af} \times P_f \times I_f$.

Denoted in the resolution of the conflict between these two tendencies, therefore, is the "resultant achievement-oriented tendency."

Viewed algebraically, it is conceived as $T_s + T_f$. A positive resultant achievement-oriented tendency occurs when the motive for success (M_s) is greater than the motive to avoid failure (M_{af}). The obverse occurs in the case of a negative resultant achievement-oriented tendency. Thus, $T_s + T_f = (M_s \times P_s \times I_s) + (M_{af} \times P_f \times I_s)$.

In a dynamic situation regarding the tendency to achieve success, the implication is that a person will choose a task of intermediate difficulty when that person's motive for success is strong. This will insure a challenge to such an individual as well as a reasonable probability of success. In contrast, an individual with a strong motive to avoid failure will avoid tasks of intermediate difficulty. As a result, the motive to avoid failure would be strongest when such a person is confronted with a task of intermediate difficulty. Therefore, this person would either choose the easiest task ($P_s = .90$) to insure success, or the most difficult task ($P_s = .10$) allowing for the failure to be rationalized.

Insofar as the incentive value of success or failure is concerned, several implications are tenable. Success in an achievement-oriented activity by an individual whose $M_s > M_{af}$ will result in an increase in the expectancy of success. Such a person will thus choose a task above the intermediate point of difficulty; (e.g., .60). Conversely, failure will weaken the expectancy of success, thereby inducing the individual to choose a task below the intermediate point of difficulty; (e.g., .40). Put another way, one's aspiration level increases or decreases as a result of experiences that are successful or unsuccessful (failure).

As mentioned earlier, interest in the theory of n Ach has been generated largely through the pioneering efforts of McClelland. His development of the n Ach score, in large measure, stimulated the refinement of n Ach theory as evidenced by the work of Atkinson (1950, 1964) and Atkinson and Feather (1966). Additional insights into the nature of n Ach are still evident in the work of Heinz Heckhausen (1967).

Heckhausen's view of the interrelationship of the person and environment in an achievement setting, as well as his theoretical orientation to n Ach, parallels that of McClelland and Atkinson. Heckhausen (1967) defined achievement motivation as "the striving to increase, or keep as high as possible, one's own capability in all activity in which a standard of excellence is thought to apply and where the execution of such activities can, therefore, either succeed or fail" (pp. 4, 5).

For Heckhausen, success and failure are "transient terminal states" since they are related to the person's achievement orientation and his environment. In this context the standard of excellence is not fixed but assumes a sliding value in relation to a person's surroundings. That is, although an individual is engaged in an activity for which a standard of excellence is set, the person adjusts it to coincide with what is perceived in the environment to be excellent. Heckhausen (1967) is quite explicit in this point, for he states,

No matter how differentiated a standard of excellence may be, it consists of one part which signifies success (no matter how strong), and another which signifies failure; the parts are separated by a more or less

narrow boundary . . . line. Depending on the achievement obtained this boundary line moves up or down. . . . Therefore, it is not possible to define objectively for a long period which incident in an individual case will signify success and which will signify failure. (p. 5)

Heckhausen has employed the projective techniques along the procedures prescribed by McClelland and his associates. In his work, however, Heckhausen emphasized the perspective of time, for he considered the directionality of achievement motivation as important as its strength. In this regard, he utilizes the terms "Hope of Success" (HS) and "Fear of Failure" (FF) in his concept of n Ach. In discussing the evaluative dispositions that these two terms depict, Heckhausen (1967) contended that either one should be considered "more prominent (1) the more it leads to actions than just wishful fantasies, (2) the more it leads to an enduring and not just sporadic activity, and (3) the more situations of different kinds it manages to organize as related to itself" (pp. 25, 26). This contention, in part, reflects Heckhausen's caution about the implications of the high degree of generality of the evaluative dispositions. He felt it was important to distinguish between wishful goal settings and active instrumental activities.

Much of Heckhausen's (1967) work involved 1) experimentation in testing n Ach theory and in 2) research in the area of the origin and development of achievement motivation. With regard to the former, he has presented evidence that 1) the TAT yields best n Ach indices under neutral conditions; 2) unlike Atkinson's orientation, M_{af} is an independent dimension; 3) the test anxiety questionnaire developed by

Mandler and Sarason yields more precise anxiety measures for determining the failure oriented index than the Manifest Anxiety Scale developed by Taylor; and 4) n Ach has been validated in female studies (pp. 12-18). Heckhausen has confirmed and reconfirmed that n Ach has its roots around 3 to 3-1/2 years of age. Furthermore, his research as well as others showed that "the sine qua non for the origin of the motive is cognitive maturation" (p. 148) and that "cognitive mastery of the requirements of a task is . . . essential" (p. 150). The net effect of this is a mirroring of one's competence which parallels the work of Winterbottom (1958) and particularly White's (1959) concept of "effectance motivation" which arises out of the organism's competence in dealing with his environment vis-à-vis exploratory activity.

In addition, Heckhausen (1967) has developed and validated two scoring keys for what he terms "Hope of Success" and "Fear of Failure." A nonsignificant correlation between his construct of FF and n Ach led him to conclude that motive to avoid failure is a separate dimension of the n Ach construct. Moreover, his method of testing which incorporates a time lag, shows higher test-retest reliability (p. 19-20). And finally, he, like Brown (1965), has offered an extensive review of n Ach research, but Heckhausen's (1967) is more thorough in that it integrates the American research and theory on achievement motivation with the research in Germany.

In addition to n Ach theory being developed and researched through projective measures, other different strategies have recently been undertaken. These involve written self-report inventories in the form of

questionnaires. One such device is a two scale questionnaire developed by Costello (1967) through factor analysis. Scale I and II reportedly measure 1) a need to do well at a task, and 2) a need to be a success. Another is the Lynn Achievement Motivation Questionnaire (Lynn, 1969) which is used in this study and described under PROCEDURES. More recently is the Berlin Q Sort (1970) which embraces the principle of specificity in that its use is specified categorically for sports. As such, her device assesses specific motives (purported to make up the n Ach construct) for participating in sports, rather than levels of achievement motivation. Her device is also used in this study and is described under PROCEDURES.

A final approach to consider uses devices developed by Tutko and his associates (Tutko and Richards, 1971) and by Bouet (1970). Tutko and his associates developed the Athletic Motivation Inventory (AMI) which purported to measure 12 traits which are considered to be related to high athletic achievement. This device was designed for the purpose of helping a coach determine in which personality areas (e.g., determination, aggressiveness, leadership) the athletes needed to be motivated. Bouet's device is similar in variables assessed but differs in that it utilizes a TAT composed of specific athletic situations. He claimed the test provides information on twelve personality situations pertinent to sport, some of which are similar to those assessed in the AMI, including measures of n Ach.

Summary. N Ach theory has travelled a long, laborious journey through its near forty-year history. It has moved away from a general

psychoanalytical framework. The general conclusion of the research is that the motive to achieve is deeply rooted and relatively unspecific. Further, that individuals with high levels of n Ach demonstrate a prevailing tendency to achieve success rather than to avoid failure and tend to engage in a lot of activity. There appears much yet to be done in order to understand this phenomenon in the many and complex behaviors of the most complex of organisms, human beings.

N Ach As Applicable To Sports

A large amount of the n Ach research at the outset and in conjunction with the refinement of the theory was devoted to studies wherein the investigators sought to corroborate the "theory." The theory underwent a torrent of research testing. Experiments about n Ach theory per se, and in relation to economics, religion, child rearing, and sex differentiation were conducted. The bulk of this work is chronicled in the classic resources of n Ach research and include McClelland, 1961; Atkinson, 1964; Atkinson and Feather, 1966; Heckhausen, 1967; and McClelland and Steele, 1973.

Throughout the n Ach literature, particularly during the earlier stages, one finds references or inferences to sport and some investigations which may be considered "marginally sport" in that the studies involve components of sport activity.

Inferences to sport. In discussing the fact that n Ach is aroused by many and/or specific TAT cues, McClelland (1953) suggested as one specific situation, "winning at football." In an account of

entrepreneurship of preliterate cultures, McClelland (1961) cited the intense interest in athletic games of the Mandan Indians as being "typical activity for people high in n Achievement." Incidentally, this group had the highest n Ach scores of the 45 cultures assessed. In recounting the achievements of Hermes, the mythological Athenian embodiment of entrepreneurship who was also an athlete, McClelland (1961) suggested a corollary between the two activities. In the words of McClelland,

the association is not unreasonable: by definition people with a high level of n Achievement show much inner concern with doing something well with striving to achieve or surpass some standard of excellence. Shouldn't they, then, be interested in competitive games? . . . (p. 322)

In connection with this reasoning, McClelland mentioned the beginning of the Olympic games which corresponded with a period of high n Achievement in classical Greece.

In discussing the importance of portraying situations that are representative of the particular motives being assessed, Atkinson (1958) cited the results of a study where n Ach scores were derived from picture cues of athletic competition. The subjects, chemistry and physical education majors, obtained nearly equal high n Ach scores in response to the athletic pictures which are considered a universal achievement disposition for males in our society; but the chemistry majors scored significantly higher in response to laboratory oriented situations, which are not considered as universal achievement-oriented expectancies. In another instance where he elaborated upon some of the areas which the scientific study of motivation should encompass,

Atkinson (1964) suggested that "the desire to succeed is certainly heightened when one finds himself challenged by some competitive activity like . . . a tennis match" (p. 6).

Marginal sport studies in n Ach. At the outset, it should be noted that a difference is to be made between two distinct patterns observed in the motivation research regarding athletic activity. The first is that up to the early 1960's, the majority of the studies inquired into what effect varying motivational conditions (encouragement, threat, stress, etc.) might have upon physical performance. Studies along these lines include the interesting work of Noble (1955), Ryan (1961), and Ulrich and Burke (1957). Later, more emphasis appeared to be made by the investigators upon the underlying factors that may account for various levels and tendencies of motivation by those who engage in sport. It is on the latter pattern that this portion of the review reflects. These underlying factors of motivation have been considered in several studies that are classified as marginally sport.

A study by Ryan and Lakie (1965), employing techniques reminiscent of those utilized by McClelland (1955) and Atkinson et al. (1960), explored the differences in performance between a noncompetitive (neutral) condition and a competitive (arousal) condition. Their results showed that subjects motivated toward success will perform better than those motivated to avoid failure in a competitive situation (ring-peg test at varied distances). Subjects in this case were those classified high n Ach (via the French test of Insight) and low in manifest anxiety (via the Taylor Manifest Anxiety Scale). In contrast, subjects

classified low in n Ach and high in MA performed better under non-competitive conditions. Ryan and Lakie concluded that measures of both variables (n Ach and MA) merit consideration for predicting competitive success.

In a later study done by Lakie (1967), he found that task difficulty (grip strength) was related linearly to galvanic skin response (GSR) in that subjects motivated toward success yielded higher GSR scores than subjects motivated to avoid failure.

A study that investigated the effect of n Ach measures on risk-taking in shooting a volleyball in a basket was undertaken by De Charms and Davé (1965) which was quite similar to the studies of McClelland and his associates (1953) and Atkinson and Litwin (1960). The similarity was in terms of the hypotheses, predictions, and results. The design differed mainly in measuring n Ach to elicit "hope of success" and "fear of failure" and in testing subjects individually. The latter procedure was done in order to equate the subjects on skill since the researchers felt more precise measures would be obtained for probability of success. Atkinson and his associates (1960) found that subjects motivated to achieve success expect to beat more of their group than do those subjects motivated to avoid failure. This was not borne out in the actual testing of their skills in a shuffleboard game. De Charms and Davé found that subjects classified as high hope of success and high fear of failure shot more successfully in addition to taking more moderate risks than did the other subjects. They also found that, in assessing probability of success individually (subject alone with the

experimenter), overall n Ach and/or anxiety had no effect upon risk-taking behavior. Their study corroborates Atkinson's n Ach theory described earlier.

N Ach in actual sport settings. As a testament to the complexity of n Ach, n Ach research applied to sport investigations is quite varied in approach. This might, at the outset, give the impression that common schemes are not to be found in the research. The work of Vanek and Hosek (1970), however, has given some indication that certain generalities apply insofar as n Ach in relation to sport participation.

Vanek and Hosek (1970) contended from their work that the need for achievement (measured by TAT as prescribed by McClelland) is a vital factor that must be taken into consideration in the preparation of superior athletes. Furthermore, their results have led them to feel that it is tenable to expect a higher need for achievement among superior athletes when compared to either average athletes or the normal population. They proposed a scheme for sport motivation (detailed in Vanek and Cratty, 1970) in which they depicted the biologically determined need for activity and the psychologically determined need for achievement lying in the center of a configuration which is impinged upon by primary and secondary social motives. The net effect of the interaction of these factors bears upon the quality of the athletic performance.

These researchers maintained that 1) the conflict between the tendency to achieve success represented by high aspiration and high

need for achievement and the tendency to avoid failure as represented by high anxiety is a very significant factor in the personality dynamics of superior athletes, and 2) it can be assumed that a relationship exists between the n Ach score and both the performance results and the psychological preparation of superior athletes.

Ogilvie and his associates (1965) investigated the relationship of psychological differences between a group of control subjects and swimmers as well as between Olympic medal winners and non-medal winners in swimming. In addition to differing in a number of personality characteristics, swimmers also differed from the controls in a greater need for success and what Ogilvie et al. term as a greater need for the "spotlight." Medal winners were superior to non-medal winners in terms of degree of ambition and in the need for newer and different experiences, qualities which are indicative of persons high in achievement motivation.

Ogilvie (1968) concluded that as a group, top athletes had a significantly greater need for achievement coupled with low levels of anxiety and unusual capacities to control their emotions under high stress conditions.

Pyne (1957) attempted to determine the significance of the relationship between athletic success and the psychological characteristics of 1) n Ach as prescribed by McClelland; 2) a motivation rating scale designed in terms of observable behavior; 3) self-concept as a person; 4) self-concept as a player; 5) aspiration by a rating scale designed to measure the player's concept of the level of success

toward which he is striving; and 6) ability as measured by a rating scale designed to rate the player's ability in terms of 14 skill components.

In testing a large population of boys high school varsity basketball teams with regard to the relationship of level of success and the above variables plus the relationship of these variables and the separate teams, Pyne found significant differences to exist between successful and unsuccessful players (as groups) on certain characteristics. (Success was based on the analysis of ability.) Pyne concluded that 1) it is possible to differentiate between successful and unsuccessful players (as groups) on the basis of their ability, on motivation as measured by behavior, on self-concept as a player, and level of aspiration; and 2) players cannot be differentiated as to successful or unsuccessful (as groups) on the basis of their achievement motivation as measured by the TAT and on their self-concept as a person. The results of Pyne's findings imply that ability is an important variable for predicting athletic success.

In an inquiry into the ability of the Athletic Motivation Inventory (AMI) to distinguish between successful and non-successful football players who were similar in physical characteristics, Arp (1972) used thirty college varsity football players as subjects. He gave them a battery of physical performance tests to measure physical characteristics.

His results showed 1) support for the hypothesis that the high ability-high physical attribute group differed significantly from the

low ability-high physical attribute group only for the traits of aggressiveness and mental toughness; 2) the untenability of the hypothesis that the high ability-low physical attribute group would differ significantly from the low ability-high physical attribute group for all of the traits measured; and 3) support for the hypothesis that the high ability-high physical attribute group would be differentiated significantly from the high ability-low physical attribute group.

Arp's findings point to the factor of ability as a dominant one for performance success. In this respect, his findings are similar to those of Pyne's.

Hammer (1967, 1970) found evidence in two studies that is somewhat contradictory to the findings of Vanek and Hosek cited earlier. In his earlier study involving college males who were divided into groups consisting of nonathletes and athletes classified as to high and low achievers on the basis of coaches' ratings, the results suggested that a high level of manifest anxiety is not a determining factor for achievement in collegiate football and wrestling.

Hammer's later study involving 2,358 college and high school male athletes from a cross section of ten sports, which included gymnastics, yielded results, in general, that were similar to his earlier investigation. His grouping varied in the second study in that 1) achievers were classified on the basis of being letter winners; 2) participants on the basis of being team members; and

3) nonparticipants on the basis of being personally active but not affiliated with a team. Variance analysis of his data yielded findings that showed 1) no significant differences between means of anxiety scores for participants versus achievers (except in golf and water polo); 2) no significant differences between college and high school anxiety scores; and 3) no significant differences between achievers, participants, or nonparticipants regarding anxiety scores.

Hammer's findings would infer that performance prediction is questionable on the basis of a single measure (anxiety). Although this would seem to be contradictory to conclusions offered by Vanek and Hosek, consideration of the different grouping classification may be important. In contrast to letter winners, Vanek and Hosek's work involved superior (champion class) athletes. Further, Vanek and Hosek incorporated other dimensions in their work.

Burton (1971) explored the relationship between trait and state anxiety, skill attainment in beginning bowling and beginning riflery, and achievement motivation delineated into two dispositions: (1) the need to do a job well, and (2) the need to be a success which results in emulation of the successful rather than by hard work. Costello's "Two Scales to Measure Achievement Motivation" were used to ascertain the two motivational factors while Spielberger's State-Trait Anxiety Inventory (STAI) was employed to determine anxiety scores. Burton's subjects' (college women) average performance scores for both activities were compared with anxiety and the achievement motivation variables by means of a stepwise regression analysis.

Her analysis of the data revealed a relationship between trait anxiety and the level of state anxiety in both skill activities, but no relationship between the two dispositions of achievement motivation. Her findings showed that higher levels of state and trait anxiety are deleterious to learning and performance in riflery but do not affect the level of skill attained in bowling. With regard to the motivational factors, Burton found no relationship in factor 2 for skill attainment in either riflery or bowling; no relationship between factor 1 and skill attainment in riflery; and an inverse relationship between factor 1 and both skill attainment in bowling and trait anxiety.

Burton's findings, in part, support the view of Vanek and Hosek but not that of Hammer's. Such a generalization, however, must consider the different activities studied as well as the differences in subject classification.

Bouet (1969) investigated the motives for sports participation and for joining sports clubs for the purpose of eliciting information about the integrative functions of sport. By means of a questionnaire, he collected data from 1,364 French male and female athletes connected with various sports.

Analysis of the responses to his questionnaire implied that 1) although the desire to have friends is not the main motive, this does contribute considerably to bring people closer to sports; 2) the "drive for victory" combines with a strong affinity for the group, particularly in "collective" ball games on a high level and in the case

of men below 31 years who belong to medium and lower socio-professional strata of the population.

Ross (1972) administered the Lynn Questionnaire, the TAT and the Adjective Check List to 98 high school athletes from five teams in a study to determine the relationship of achievement need in swimming based on socio-economic, ethnic, and performance variables.

His findings showed that 1) the need to achieve is not related to socio-economic or ethnic variables; 2) achievement motivation does not vary with environmental situations differentiated by schools; 3) performance is related to n Ach as measured by the nonprojective tests; and 4) while the nonprojective measures of n Ach assess similar qualities, the projective measure differs from the nonprojective n Ach measures.

Gorsuch (1968) compared individual sport athletes, team sport athletes, and nonathletes with respect to n Ach assessed by means of the TAT as devised by McClelland plus two additional pictures, athletic in nature as proposed by Atkinson. He hypothesized that n Ach was an important component in the psychological makeup of athletes based on the concept of high n Ach being related to high performance and low n Ach being related to low performance in athletics. In addition, he also sought to use his study as a test of the construct validity of McClelland's TAT. His subjects were classified as athletes on the basis of participation in freshman or varsity sports within the same university. Nonathletes were also from the same institution.

Gorsuch found no differences in n Ach level among his three groups for either the 4 or 6 picture TAT. Nor were any significant differences found between any of his ten sub groups (five individual sports, five team sports) of the athletic grouping.

A point to note is that a bimodal distribution resulted in the n Ach scores obtained on the four picture test in contrast to the "normal" shape assumed by the score distribution of the six picture test. The two athletic pictures yielded high point scores for the majority of subjects (e.g., gymnasts scored means of 3.83 and 9.33 respectively for the four and six picture TAT) and may be the cause for the different distribution configurations. Such results might have implications for construction of tests specific to the situation.

Willis (1968) based his study on a general hypothesis that n Ach would be reflected in the degree of successful performance in collegiate wrestling. On the premise of a high positive relationship between n Ach and wrestling success, Willis felt that athletic success could be predicted from n Ach scores. He also speculated that competitive spirit or desire might be a function of an athlete's need to achieve.

Measures of the achievement motive and the motive to avoid failure were taken respectively, by means of the TAT prescribed by Atkinson and the Maudsley Personality Inventory; wrestling success was assessed on the basis of matches wrestled and the match results. Competitive spirit was measured according to subjective ratings of the wrestlers and the coach. A number of hypotheses and sub-hypotheses were analysed

by means of the Mann-Whitney U Test and by means of Spearman rank correlation coefficients.

Willis' results, in general, showed that achievement motivation could not be considered a valid predictive measure of success; nor could n Ach measures specified by Atkinson discriminate between successful and unsuccessful wrestling performance. His hypothesis of a high positive correlation between n Ach and "competitive spirit" was supported only when the achievement motive was used singularly as well as taking into account situational factors.

Reflected in these results are the liberty taken by this investigator to modify the n Ach measuring instrument (omitting the incentive variable); the lower division finish of his subject's team (slightly under .500); the wide range of skill or success among his final 11 subjects; and his measure of "competitive spirit," all factors which may challenge the obtained measures and their attendant results.

Plummer (1969) made a departure from assessing n Ach by projective techniques in his study through the use of Q methodology. He inquired into whether a difference in n Ach is evident among athletes who participate in gymnastics (individual-oriented sport) and baseball (team-oriented sport). He hypothesized that 1) gymnasts have different n Ach in terms of social responses than do baseball players; and 2) gymnasts are more highly motivated than baseball players.

An analysis of his n Ach measures obtained by Q sorting resulted in finding both hypotheses untenable. The first hypothesis was found untenable on the basis of a Spearman coefficient of rank correlation

of .88 between the social response values assigned the sort statements by gymnasts and baseball players alike. The second hypothesis was found untenable on the findings of mean n Ach scores of 39.74 and 39.71 for gymnasts and baseball players, respectively. The social responses of both groups as well as their n Ach levels were quite similar.

Webber (1970) pursued the contention that social desirability was a factor that may have "contaminated" Plummer's results. He took his approach on the assumption that social desirability is a major source of variance pervading the results of self-inventories. In this respect, Webber examined the validity of Plummer's Q Sort of n Ach and tested two hypotheses: 1) there is no significant difference between the sort for social desirability and the sort for n Ach on the Plummer instrument; 2) there is no significant difference between statements of achievement motivation and social desirability within the Plummer instrument.

A content analysis of the statements was made by assigning each statement to one of five categories purportedly representing its meaning. Mean scores for each statement were calculated and then compared by the Wilcoxon matched pairs-sign rank test after each subject did the sort twice. No significant differences were found between administering Plummer's Q Sort for social desirability and for n Ach; nor was there a significant difference in the inferred meanings of the statements for either of the two sorts. Thus, the results of the two administrations of the Q sort, one in the context of self-likeness, and one in the context of social desirability, supported both hypotheses.

Berlin (1971), in a study serving as a small part of her investigation into a theoretical structure of the motives of collegiate women athletes, sought to ascertain the stability of motivational tendencies and the level of n Ach among female gymnasts who were members of two high nationally ranked teams. Motivational tendencies were assessed by means of her Q sort while n Ach scores were measured by Lynn's questionnaire.

She found relative stability in the motivational tendencies (self-regard, expression, social interactions, and mastery) as revealed by the similar mean values of the sort statements in a pre and post-season sort. Thus, the first aspect of her investigation was established in that an ANOVA of a pre and post-season sort revealed no significant difference while correlations between the statement means of each sort yielded significant relationships. As regards the n Ach level of her subjects, Berlin found no significant difference in the n Ach scores between the two teams.

Berlin's findings led her to conclude that the results warranted further delineation of her model of athletic motivation upon which she formulated her Q sort and which was utilized in this study.

Two other studies, similar in nature to Berlin's, are of interest since they are also concerned with the underlying factors that account for participation in competitive sports.

A paper delivered by Orlick (1973) at the World Congress of the International Society of Sport Psychology in Madrid centered on the role one's expectancy plays as a motivational factor influencing sports

participation. He cited the results of studies conducted in Canada and the Peoples Republic of China which indicated that an individual's decision to participate or not is contingent upon the positive and negative consequences of expectations. From this, the author recommended that environmental contingencies must be altered to facilitate positive expectations in order to involve mass participation in sport and physical recreation.

Butt (1973) analysed three case histories to illustrate the plausibility of establishing a motivational construct for sports participation and the use thereof for study purposes. She concluded that the competence model (derived from personality dispositions to be effective in a sport environment) offered a plausible choice for a motivational construct for sports participation. In this regard, she contended that competence motivation theorized by White might be widely applied to sport. Furthermore, she suggested that since "competence motivation is the most constructive, functional and desired motivation for sports participation" (p. 12), a program of behavioral control akin to social engineering wherein competence-oriented behaviors are encouraged and dysfunctional behaviors (e.g., hostile aggression) are discouraged should be undertaken.

Summary on n Ach studies in sport. A variety of observations seems apparent as a result of the forays into the nature of n Ach in the domain of competitive sports. In general, superior athletes considered high in n Ach opt for intermediate risks, whereas this predilection among athletes classified other than superior, is unclear.

Similarly, no clear-cut evidence has been established as to the relationship between anxiety and n Ach, or the use of n Ach scores for performance prediction. Thus, it is quite likely that differences in the achievement motivation configuration exist between superior and ordinary competitive athletes. Research on the stability of the motive to achieve in sports is consistent with the n Ach research in general, thus lending some credence to the view that this personality trait is embedded in early childhood and prevails.

Since n Ach is but one facet of the personality makeup, it is impinged upon by a host of psycho-social-biological factors. In this respect, there are indications from the research that n Ach should be investigated in the realm of both multi-factor models and single case studies as reflected in case histories and Q methodology.

CHAPTER III

PROCEDURES

The purpose of this study was to analyse the levels of n Ach and the motivational tendencies of male and female collegiate gymnasts.

Selection of Subjects

Subjects were selected from among high-performing teams as defined herein. The subjects were obtained by written request from the examiner to the team coaches. The choice of specific teams for this purpose was determined on the basis of the 1973-74 rankings and ratings of men's and women's collegiate gymnastics teams.

Male gymnasts. Solicitation for male subjects was made from among the top five ranked teams in each of the four NCAA competitive regions: eastern, mid-eastern, mid-western, and western as reported in the last issue of the National Association of College Gymnastics Coaches Statistical Scoring Report for the 1973-74 season (Nissen Corporation, May 1, 1974). Confirmation of willingness to cooperate in the research was received from 12 men's teams. Subjects were obtained from ten of these teams. One team did not meet the definition requirement in that its average score for the season was below 200 while the second team submitted its data (for three subjects) too late.

The participating men's teams were 1) Arizona State University, 2) Indiana State University, 3) Louisiana State University, 4) Penn

State University, 5) Springfield College, 6) Southern Connecticut State College, 7) Southern Illinois University (Carbondale), 8) The University of Massachusetts, 9) The University of Michigan, and 10) Washington State University (Pullman).

The classification of these teams as high performing is reflected in their accomplishments. The ranking of these teams in Regional Competitions ("NCAA Regional Results," 1975) and/or the 33rd (1975) NCAA Gymnastics Championships (Wright, 1975) as shown in Table 1 revealed the following.

Table 1
Regional and/or National Rankings
of Participating Men's Teams

Team	Regional Results	National Results
Louisiana State University	1st, Southern Conference	2nd
Southern Illinois University	2nd, Eastern Independents	3rd
Indiana State University	1st, Eastern Independents	4th
Michigan University	1st, Big Ten	6th
Arizona State University	1st, WAC	8th
So. Conn. State College	1st, Eastern League	9th ^a
Washington St. University	3rd, PAC 8	11th
Penn State University	3rd, Eastern Independents	13th ^b
Springfield College	2nd, Eastern League	25th ^b
The University of Mass.	3rd, Eastern League	--

^aFirst in the NCAA Division II Championships.

^bFourth in the NCAA Division II Championships.

A number of individuals from these teams placed comparatively high in their competitions. The subjects of this study include those who placed 6th, 10th, 12th, 13th, 16th, 21st, and 22nd in the NCAA All-Around; 1st, 3rd, 4th, 6th, and 8th in Floor Exercise; 2nd, 6th, 7th, and 8th on Pommel Horse; 2nd, 2nd (tie), 7th, 8th, and 10th on Still Rings; 4th, 4th (tie), and 7th in Vaulting; 2nd, 3rd, 5th, 6th, and 7th on Parallel Bars; and 3rd, 5th, 7th, and 9th on the Horizontal Bar (Wright, 1975).

Female gymnasts. Solicitation for female subjects was made from those teams which scored 95 or more in the 1974 AIAW National Gymnastics Championships (Shelly, 1974) held at Sacramento State University, California, on April 5 and 6, 1974. In addition, teams recommended by Charles Johnson (1974), Southwest Missouri State University coach, were also solicited. His recommendations were sought on the basis of his teams having been involved frequently in the national championships. It was felt, therefore, that his personal observations from first hand experiences would enable him to provide the writer with a list of "perennial" national qualifying teams. These recommendations were taken in lieu of national rankings via a statistical report. Such information was not available.

Confirmation of the willingness to cooperate in the research was received from eleven women's teams. Subjects were obtained from nine of these teams. Two teams did not meet the requirements as specified by the definitions in that the average scores of these teams for the season were under 95 points. The participating women's teams were

1) Iowa State University, 2) Michigan State University, 3) Penn State University, 4) Southern Connecticut State College, 5) Southwest Missouri State University, 6) Springfield College, 7) The University of Massachusetts, 8) The University of Nevada (Reno), and 9) The University of Northern Colorado.

As in the case for the men's teams, the seasonal efforts of these women's teams reflect consistency with the definition requirements as specified herein. The Regional Results (Dowsing, 1975) and results of the AIAW Gymnastics Championships (Fields, 1975) as listed below in Table 2 show the following.

Table 2
Regional and/or National Rankings
of Participating Women's Teams

Team	Regional Results	National Results
The University of Massachusetts	1st, Eastern Region	2nd
Springfield College	2nd, Eastern Region	4th
Penn State University	3rd, Eastern Region	5th
So. Connecticut State College	4th, Eastern Region	--
Michigan State University	2nd, Region Five	8th
Southwest Missouri State Univ.	1st, Region Six	9th
University of Nevada (Reno)	2nd, Region Eight	11th
Iowa State University	4th, Region Six	17th
University of Northern Colorado	6th, Region Seven	--

Comparatively high placings in the national championships were evidenced in the performances by a number of individuals from these teams. These individuals have placed 1st, 2nd, and 13th in the

AIAW All-Around; 1st (tie), and 4th in Vaulting; 2nd, 4th, and 6th on the Uneven Parallel Bars; 1st, and 5th on the Balance Beam; and 1st, 2nd, 4th, and 5th in Floor Exercise (Fields, 1975).

In addition to the approaches outlined above regarding selection of subjects, the writer made several personal appeals. One was in the form of a general announcement by the writer during the research presentations of the "Biomechanical Task Force" at the United States Gymnastics Federation held in Chicago, November 8-10, 1975. During the course of the USGF Congress, the writer made face-to-face appeals, most of which involved previously committed men and women coaches. This was done as a means of impressing upon them the importance of the project and seriousness on the part of the writer. A final approach was a general appeal for help in the research as announced in the "Weekly Gymnastic News Letter." (Wright, 1974)

Selection of Measuring Instruments

Data was obtained from three sources: 1) The Lynn Achievement Motivation Questionnaire, 2) The Berlin Q Sort, and 3) the dual meet results of each team for the 1974-75 competitive season.

The Lynn Achievement Motivation Questionnaire. The Lynn Questionnaire was used to ascertain n Ach scores of the subjects. This device, developed by Richard Lynn (1969), measures McClelland's (1961) concept of achievement motivation, which in turn, was derived from Murray's (1938) TAT.

In Lynn's view, the use of the TAT presents certain disadvantages,

chief of which are 1) imperfect reliability between scorers, 2) special (clinical) training required of the administrator, and 3) the lengthy process of administration (two hours or more divided into two sessions with at least one day intervening between sessions). The efficacy of using Lynn's Questionnaire, aside from its expediency, is that the factor analysis of 63 achievement statements taken from the TAT protocols, by which his scale was devised, show most components loading on a single factor, super-ego strength. In addition, the test taps motivational levels of entrepreneurs, professors, and business managers, groups to which the test was initially administered and of which Lynn maintained college students are representative.

Lynn's Questionnaire shows high validity in that t tests between all three groups and college students (considered to be the norm) yielded significance at the 0.01 level. Furthermore, the entrepreneurs scored highest of all, which is consistent with McClelland's (1961) contention that entrepreneurship, e.g., being one's own boss, is the most favored way of life of the high achiever. This is a crucial concept in the rationale for validation and seems to be borne out in terms of the difference between entrepreneurs and managers (those who work for others), showing statistical significance ($t=2.60$; $p<0.05$).

Considering that athletes may have a disposition for success which is similar to that of the above three groups, it seemed plausible that the Lynn Questionnaire would serve adequately to assess achievement levels among gymnasts who are members of high-performing teams. The choice for using Lynn's instrument was made, therefore, on the basis of this belief.

The Berlin Q Sort. This device was utilized to obtain measures of the three motivational tendencies that were examined: MS, DI, and SR. This device is a self-report inventory consisting of 60 statements on motivational tendencies which are divided into three sets of twenty statements each. The 60 statements are sorted by each subject along an eleven point continuum ranging from "Most Like Me," at one end, to "Least Like Me," at the other end.

The Berlin Q Sort derives from an athletic motivation model devised by Berlin from responses to her original 80 Q sort statements. In a reliability sub-study involving college women gymnasts, Berlin (1971) found a significant relationship between statement sorts and re-sorts in four motive categories. Further delineation of her conceptual model of athletic motivation via factor analysis revealed five personal derivatives that cut across the three motivational tendencies, thus yielding fifteen personality factors.

The choice for selecting a Q sort was made on the basis that it, being a nonprojective technique, is administratively more feasible and purportedly more reliable than a projective test. The decision to use the Berlin Q Sort in particular was made on the basis that it was designed and validated for assessing achievement motivation measures specific to sport and, therefore, would be a practical tool.

Q sorting is a method described by Stephenson (1953) in which a person responds to self-referent statements and self-notions about a concept, the results of which are studied empirically. It is a method uniquely adapted to investigating a single concept such as achievement

motivation in sport since the technique is based on the methodology of handling single cases, e.g., individual gymnasts.

The procedure in devising a Q sort is for an investigator to draw up a sample of from 60 to 120 statements characteristic of the concept under investigation. It is imperative that statement structure show clarity and conciseness. Q sort derives its name from the methodology of the subject sorting the statements into a specific distribution along a continuum of factors, indicating those most like the subject to those least characteristic of the subject. The shape of the distribution will depend upon whether the sorting is forced choice or unforced choice.

In a forced choice Q sort, the distribution will take the shape of an inverted quasi-normal curve, with the majority of responses (statements piled) in the middle columns. The other columns regress in the number of statements toward the extreme ends. The unforced distribution will not necessarily take on a uniform configuration. Mowrer (1953) maintained that it can be constructed in rank order (as many categories as statements), true and false (only two categories), or any intermediate number of categories.

There is some controversy over the use of forced choice and unforced choice procedures in Q sorting. The relative merits of either procedure is mixed; e.g., Jones (1956) finds the unforced choice procedure lacking while Block's (1956) work indicates that the forced choice procedure is equal or superior to unforced sorting. Block as well as Kerlinger (1973) present cogent and rational arguments for the use of either. In essence, the particular technique of sorting is contingent upon the type of measures being taken.

Block's findings showed that the unforced technique is preferable in those situations where the scale separation of items is important and in which it would be irrelevant or undifferentiating to order items, and that the forced procedure is preferable in circumstances where item order is considered of extreme importance. Kerlinger maintained that the shape of the distribution is not so important as the fact the subjects are compelled, via Q sorting, to make discriminations they ordinarily would not make.

A more important consideration according to Kerlinger (1973) is the question of information supposedly lost (mean and standard deviation) in the process of using an ipsative procedure such as Q sorting where all subjects have the same general mean and the same general standard deviation. Kerlinger summed up this point nicely:

When elevation [mean] and scatter [standard deviation] are important, do not use ipsative measures. . . . If, on the other hand, mean differences are not important but the relations among variables within individuals or groups are important, then ipsative scores may well be appropriate. (p. 597)

Since this study was concerned with the variables within the gymnasts, namely the three motivational tendencies of MS, DI, and SR, the forced choice Q sort technique was deemed appropriate. Hence, the Berlin Q Sort, which entails a forced choice procedure, was used in this study.

Dual meet results. These were procured for the purpose of determining each subject's mean performance score for the competitive season. Mean performance scores were the basis for classifying subjects into the four groups: the high-performing and the lower-performing male and female gymnasts.

Collection of Data

The collection of data entailed two steps. The first involved the administration of the Lynn Questionnaire and the Berlin Q Sort in a single session. The second step involved collecting the meet results from the respective coaches of the participating teams.

Administration of the Lynn Questionnaire and the Berlin Q Sort.

Administration of the measurement instruments was done by the investigator insofar as practicality allowed. In circumstances where this was not possible, the team coach administered the inventories, following the same established procedure as would the investigator. The established procedures were put into detailed, written form and multicopied. Individual uniform packets were made up and sent to the coaches. These packets included a packing list detailing the items in the packet, a sheet describing the procedures for administering the questionnaire and the Q sort, 12 Lynn Questionnaires, 12 Q decks, 13 instruction sheets for Q sorting, 12 response sheets for Q sorting, self-addressed stamped envelopes for sending meet results to the writer, wrapping paper, packing tape, and a metered postage stamp for returning the materials and results to the writer. Copies of the first six items with the exception of the Q decks are found in Appendices C through I. (Appendix H lists the Q deck statements.)

A time table of dates was arranged with the coaches in the north-east section of the U.S. during the month of September, 1974. The inventories were administered during the period of October and November,

1974. All other teams had the packets of materials mailed to them so as to allow for the inventories to be administered by the first third of the competitive season. The inventories were administered to each team as a whole in a single session and at a time that was not in conflict with the practice schedule of the team. All subjects met at a specified time in a designated room. As far as was possible, rooms were equipped with tables and chairs to allow for ease of sorting. Where tables were unavailable, broad arm-desk chairs were used.

The Lynn Questionnaire. The 60 items in the Berlin test take approximately 45 minutes to sort; the Lynn Questionnaire, being an eight-item test, takes considerably less time. Therefore, subjects were given the Lynn Questionnaire first. This allowed them to be ready to receive instructions for Q sorting at one time.

The questions in the Lynn Questionnaire require either a "Yes" or "No" response, which is done by merely check marking the appropriate term. Subjects were given the specific instructions verbally. The same instructions were printed on the test: "Please check either "Yes" or "No" in response to each question. Be sure to answer each question, deciding either way, even if it is hard to make a decision." A maximum score of 8 could be obtained for n Ach. This score was computed on the questionnaire (see Appendix E).

Subjects were instructed that, upon completion of the Lynn Questionnaire, they were to hand signal the examiner who then checked and collected the response sheet. The check assured that all items received a response and that the subject's name or initials and school name was

listed since this was to be paired with his/her performance scores for the purpose of group classification.

The Berlin Q Sort. Each subject was furnished a Q deck (statements) consisting of sixty 3 x 5 index cards, a response sheet, pencils, and an instruction sheet.

The subjects were asked to read the instruction sheet; then, to assure they understood, the examiner (or coach) read the instruction sheet aloud and answered any question that was raised.

The subjects were instructed that upon the completion of the Q sort, they were to signal the examiner to collect the response sheets. At that time, the examiner checked the subject's response sheet. The check was to insure that a response was made to each statement and that the subject's name was listed since it was to be paired with his/her performance score for the purpose of group classification. Statement responses obtained values from 10 to 0 points from the "Most Like Me" to the "Least Like Me" row of columns (A to K) on the response sheet (Appendix I). These values were then entered on a tally sheet (Appendix J) by the investigator for computation.

Dual meet results. The coach of each participating team was furnished with a number of self-addressed stamped envelopes for mailing in his/her team's results for the season immediately upon completion of each dual meet.

Classification of Subjects

The writer sent letters to all participating coaches toward the end of the season to inform them that it was vital to submit the last dual meet result immediately upon its completion and to indicate that it was the last meet result.

Upon receipt of the last dual meet result for a team, the performance scores of the subjects were entered on their respective tally sheets along with their previous scores and calculated to determine their mean performance scores for the season. This tally sheet is found in Appendix K.

When all the mean performance scores for men and women were computed, they were listed in ascending rank order. The distribution of mean scores for the male gymnasts and the female gymnasts were then divided at their medians resulting in each of the two experimental groups (high-performing and lower-performing) for both male and female gymnasts. Thus, four groups were designated.

Male gymnasts' score distribution. Seventy-three male subjects were obtained who yielded mean performance scores for the season ranging from 7.09 to 9.43 with a median of 8.59. A t test to determine whether a significant difference existed between the means of the 36 scores on each side of the median was computed. The resultant t of 11.4675 revealed that the means were significantly different since a value of 2.648 is required for significance at the .01 level of confidence.

To guard against contamination by the scores closest to the median, the middle ten percent (7) of the scores were deleted. This reduced distribution, then, of 33 scores on either side of the median was again subjected to a t test which yielded a highly significant difference between the two sets of mean scores. The resultant t of 12.4398 was far beyond the required value of 2.660 for significance at the .01 level of confidence. Thus, the two male groups were designated.

The distribution of the 73 mean performance scores for the male subjects are listed in Table 3.

Table 3
Distribution of Men's Mean Gymnastics Performance Scores
for the 1974-75 Competitive Season

7.09	8.36	8.60	8.98
7.60	8.36	8.64	8.98
7.62	8.37	8.66	8.99
7.85	8.38	8.68	9.03
7.86	8.45	8.72	9.03
7.89	8.46	8.78	9.04
7.90	8.50	8.8	9.05
7.96	8.51	8.83	9.06
8.07	8.53	8.84	9.07
8.08	8.53	8.90	9.11
8.18	8.54	8.90	9.11
8.20	8.55	8.93	9.12
8.21	8.55	8.94	9.21
8.23	8.58	8.95	9.21
8.23	8.58	8.95	9.27
8.24	8.58	8.95	9.27
8.26	8.59	8.96	9.30
8.31	Mdn. -- 8.59 -- Mdn.	8.97	9.43
8.32			

Female gymnasts' score distribution. The same procedure used for dividing the male subjects into two groups at the median was utilized for the female subjects. The initial number of female subjects totaled 66, which yielded mean performance scores for the season ranging from 6.82 to 9.10 with a median score of 7.845.

A t test between the means of each group of scores on either side of the median resulted in a t of 12.920. In the same manner as for the male gymnasts' scores, a t of 14.2793 was obtained after deleting the middle ten percent (6) of the scores. This t , as in the case prior to deleting the middle ten percent of the scores, showed an obvious significant difference (p . .01 = 2.648) between the two sets each of 30 mean scores.

The distribution of the 66 mean performance scores for the female subjects are listed in Table 4.

Equating the Groups

In order to have equal numbers in each of the four groups, six of the male subjects were deleted. This was done by randomly selecting three cases each from among the high-performing and the lower-performing male gymnasts. Thus, 30 subjects made up each of the four groups: high-performing males, high-performing females, lower-performing males, and lower-performing females.

The results of each subject's responses to the two inventories were then organized into four sets of scores, which comprised the four groups, and analysed.

Table 4
 Distribution of Women's Mean Gymnastics Performance Scores
 for the 1974-75 Competitive Season

6.82	7.46	7.93	8.28
7.11	7.48	7.95	8.28
7.15	7.48	7.96	8.29
7.16	7.51	7.96	8.33
7.17	7.52	7.97	8.33
7.21	7.53	8.02	8.36
7.22	7.56	8.02	8.48
7.23	7.62	8.03	8.48
7.26	7.63	8.11	8.54
7.27	7.64	8.12	8.58
7.30	7.65	8.14	8.66
7.32	7.67	8.17	8.66
7.36	7.74	8.17	8.84
7.37	7.81	8.19	8.92
7.42	7.81	8.21	9.10
7.44	7.82	8.26	
7.44 (7.845) Mdn.	7.87 Mdn. (7.845)	8.28	

CHAPTER IV

ANALYSIS OF DATA

The design of this study required the use of two analysis techniques in order to obtain answers to the three broad questions asked. Questions 1 and 2, dealing with possible differences in n Ach levels and sport motivational tendencies, respectively, were analysed by the use of a 2 x 2 factorial ANOVA. Question 3, dealing with possible differences in mastery of skill (one of the three sport motivational tendencies) when correction is made for n Ach scores, required the use of analysis of covariance.

Achievement Motivation Levels

To determine whether significant differences in n Ach levels existed among the gymnasts according to their sex and gymnastic performance level, that is, between high-level and lower-level male and female gymnasts (question 1), a 2 x 2 factorial ANOVA was computed on the basic statistics generated from the subjects' n Ach scores shown in Table 5. Raw scores for n Ach are shown in Appendix L.

Homogeneity of variance, a main assumption in ANOVA, was assured within the four groups by an F of 1.25 calculated for the high-level females and lower-level males who had, respectively, the highest and lowest sample variances (41.62 and 33.24). The 1.25 value is well below the level of significance for .01 or .05, either of which would

Table 5
Basic Statistics Summarized
from n Ach Scores

	Lower-level males	Lower-level females	High-level males	High-level females
\underline{N} =	30	30	30	30
ΣX =	166	178	173	185
ΣX^2 =	964	1,106	1,039	1,207
\underline{M} =	5.53	5.93	5.77	6.17
\underline{SD} =	1.25	1.31	1.19	1.51

indicate that these groups would then be vitiated (Kerlinger, 1973). This was not the case. Results for the test of homogeneity of variance for the ANOVA on n Ach are presented in Table 6.

Table 6
Results of the Test for Homogeneity of
Variance in the Analysis of n Ach

Highest sample variance	41.24 (High-level females)
Lowest sample variance	33.24 (Lower-level males)
\underline{F} value	1.25 (n.s.)

The choice for employing a 2 x 2 factorial ANOVA in the question under consideration was made since two factors are involved, sex and

performance level. A factorial analysis of variance has the power to reveal which source of variance accounts for any significant differences that may be found by an investigator in analysing his treatment effects or conditions. This results from the fact that the technique makes possible the segregation of the sources of variation. In this question, therefore, it can be determined whether differences among the above means of the four groups owe their divergencies to sex, performance level, or both. Further, there is the possibility of interaction variance attributable to the joint effects of these two variance sources acting together as well as acting alone on n Ach.

Computation of the 2 x 2 factorial ANOVA to determine whether these variance sources account for any significant differences indicated that these data do not. Although the results shown in Table 7 show an F value of 2.74 for the factor of sex as compared to an F of .93 for the performance level factor, no significant difference exists with respect to these subjects insofar as n Ach level. A mean square value of .00 for interaction makes this lack of difference more obvious.

From the results shown in Table 7 it can be concluded that, although the means of the four groups differ with respect to n Ach, they are far from approaching significance. One point, however, that these data do demonstrate, is that, regardless of sex or performance level, the subjects under consideration in this study reveal mean n Ach scores that are relatively high. This is consistent with Lynn's (1969) findings that the mean for British university students

Table 7
Results of the Analysis of Variance on n Ach

Source	<u>df</u>	<u>SS</u>	<u>MS</u>	<u>F</u>
Within	116	202.88	1.75	
Between	(3)			
Factor 1 (sex)	1	4.80	4.80	2.74 (n.s.)*
Factor 2 (level)	1	1.63	1.63	.93 (n.s.)*
Interaction	1	0.00	0.00	
Total	119	209.31		

* $F(1,116) = 6.88, p < .01; 3.93, p < .05.$

(one of the criterion groups used in devising his n Ach scale) was 4.82 (p. 531). The subjects (college and university student-athletes) in this study yielded group mean n Ach scores ranging from 5.53 to 6.17 for a total mean of 5.85. This represents a full point higher than that of Lynn's students who were a cross section and thus were less select than the subjects of this investigation. A further point of consistency is that Berlin's (1971) two groups of gymnasts yielded n Ach scores of 5.31 and 6.31 and for a total mean of 5.81 which is quite similar to the n Ach scores of the subjects in this study.

See Table 8 for a visual comparison of the n Ach scores of these gymnasts in relation to Berlin's gymnasts and Lynn's students.

Table 8
N Ach Scores of Groups in the Lynn, Berlin,
and Present Studies

Group	<u>N</u>	Mean	Total Means	<u>SD</u>
Lynn				
University students	200	4.82	--	1.56
Berlin				
Gymnastic team A	13	6.31	5.81	.95
Gymnastic team B	16	5.31		1.49
Present study				
Lower-level males	30	5.53	5.85	1.25
High-level males	30	5.77		1.19
Lower-level females	30	5.93		1.31
High-level females	30	6.17		1.51

These results show an obverse relationship between n Ach and performance level upon comparing the n Ach scores of the men and women gymnasts. N Ach was slightly higher in the groups designated as high-level performing gymnasts with the scores of females in general being higher than that for males in general. Further, the lower-level performing female gymnasts had higher n Ach scores than either the lower- or high-level performing male gymnasts but lower than the high-level performing female gymnasts (see Tables 5 and 8). In this respect,

these data only appear to reflect McClelland's and his associate's (1953) contention that there is no necessary connection between n Ach and efficient performance. He qualified his contention on the basis that a poor performer could show high n Ach in some cases but this would be rarely evidenced. Since McClelland did not specify a criterion for efficient performance, it is difficult to generalize upon this finding. Nevertheless, the lower-level subjects in this study still evidenced gymnastics performance scores which were respectable. Although some individuals in this study showed low n Ach, a "true" lower-level, or perhaps, better stated, low level performing group, gymnasts on low scoring teams who individually score below 6.0 points, might reflect a different n Ach profile than those of this study. The lower-level performers in this study could not be considered as "true" poor performers; they were simply lower-level performers on high-performing teams.

Although no significance was found in n Ach between these groups, the fact that their n Ach scores were high indicate that n Ach and performance is related for these subjects. This point coincides with the work of Ogilvie (1968), Bouet (1969), and Vanek and Hosek (1970). Ogilvie found that "top athletes" have high n Ach; if Bouet's "drive for victory" can be construed as high in n Ach, his subjects on ball teams so identified, were also classified as "high level athletes," thus reflecting a relationship between performance and n Ach; and Vanek and Hosek maintained that a relationship exists between n Ach and performance among "superior athletes."

The finding of no significance in n Ach is also consistent with the finding of Berlin (1971) in a similar study. Her subjects, gymnasts of two high performing women's teams, showed high n Ach but no significance was found in this measure between the members of the two teams. The n Ach results of Berlin's and this study appear to have a bearing upon the limited amount of available research at this time which shows that n Ach is unrelated to sex. For example, a study by Simon (1971), who inquired into the relationship of n Ach to masculinity-femininity traits among females in competition for the purpose of recognition, the most significant finding, showed that n Ach was unrelated to femininity. In a similar vein, Roberts (1975), who investigated the effects of n Ach and sex on risk-taking, found that women were more conservative in risk-taking but that sex and n Ach exerted no effects upon performance scores which revealed that men and women were equally adept. In view of Robert's results and those of this study, the conservative nature of women regarding risk-taking (a factor in gymnastics) appears to be of little significance when viewed in light of the women's need to achieve.

The results of the analysis on n Ach in this study indicate that these subjects are unlike the typology profiled by Horner (1972). In no way do they appear to reflect the typology of "motivation to avoid success" advanced by Horner. These subjects are thus completely in accord with those who are high in n Ach as detailed by McClelland et al. (1953). The fact that these females have already elected to succeed is a testament that they are more eager than usual to achieve success, a

notion that is supported upon considering the fact that American women gymnasts have surpassed the men gymnasts internationally.

The n Ach results for the women in this study seem to be consistent with the notion based on McClelland's (1953) work, that n Ach is linked with social acceptability. Although it is becoming increasingly popular and seemingly acceptable for women to engage in competitive sports, it is, in the writer's judgment, too early to state categorically that participation in sports by women is viewed as socially acceptable by the majority of the American public. If social movements of the recent past are any indication, it would appear that time will have to pass in order for people to become accustomed to the ubiquitous female athlete. It does seem, however, that the American collegiate woman athlete participates in sport and aspires to achieve regardless of whether or not her activities are viewed as socially acceptable. Insofar as gymnastics is considered, women and girls in American society have a long history of participation. In addition, much of their participation has been, and still, is done in co-ed settings in schools, organizations, and in the privately-run independent clubs. In this regard, it appears that the woman gymnast is participating in a socially acceptable activity.

Motivational Tendencies

To determine whether significant differences existed between the sexes and the levels of performance of the gymnasts with respect to the three motivational tendencies under consideration, three separate 2 x 2 factorial ANOVAS were necessary.

Mastery of skill. Computation of the data for generating the analysis on the MS scores yielded the basic statistics summarized in Table 9. Raw scores for MS are shown in Appendix M.

Table 9
Basic Statistics Summarized from
Mastery of Skill Scores

	Lower-level males	Lower-level females	High-level males	High-level females
\underline{N} =	30	30	30	30
ΣX =	149.35	149.60	150.70	153.10
ΣX^2 =	746.80	748.33	761.79	783.54
\underline{M} =	4.98	4.99	5.02	5.10
\underline{SD} =	.34	.28	.41	.28

Homogeneity of variance was evidenced by an F value of 1.05 as determined between the high-level females and the lower-level males who had, respectively, the highest and lowest sample variances (27.02 and 25.75). This is shown in Table 10.

Calculation of the 2 x 2 factorial ANOVA to determine whether significant differences in mastery of skill would be found among these subjects according to sex, performance level, or both of these factors, yielded the results as reported in Table 11.

Table 10
Results of the Test for Homogeneity of Variance
in the Analysis of Mastery of Skill

Highest sample variance	27.02 (High-level females)
Lowest sample variance	25.75 (Lower-level males)
<u>F</u> value	1.05 (n.s.)

Table 11
Results of the Analysis of Variance
on Mastery of Skill

Source	<u>df</u>	<u>SS</u>	<u>MS</u>	<u>F</u>
Within	116	12.80	.11	
Between	(3)			
Factor 1 (sex)	1	.06	.06	.55 (n.s.)*
Factor 2 (level)	1	.20	.20	1.82 (n.s.)*
Interaction	1	.04	.04	.36 (n.s.)*
Total	119	13.10		

*F (1,116) = 6.88, $p < .01$; 3.93, $p < .05$.

Although the performance level factor in this analysis yielded an F value which was three and five times those for the factors of sex and interaction, respectively, it was not statistically significant. It can be concluded that these female and male gymnasts, regardless of their level of

performance, show no significant differences with regard to their motivational tendency toward mastery of skill.

Although mastery of skill is not differentiated between the sexes or performance levels, the fact that it was the second highest scoring tendency obtained from the Q sort for each group may indicate that performance quality is of much concern to these subjects. The display of a gymnast's skills usually in a solo performance and in which errors cannot be diffused as in a team-type sport may account for this concern.

Dynamic interaction. Computation of the data for the analysis on the DI scores yielded the basic statistics reported in Table 12. Raw scores for DI are shown in Appendix N.

Table 12
Basic Statistics Summarized from
Dynamic Interaction Scores

	Lower-level males	Lower-level females	High-level males	High-level females
<u>N</u> =	30	30	30	30
ΣX =	140.35	138.45	138.	136.00
ΣX^2 =	661.04	644.00	640.60	621.92
<u>M</u> =	4.68	4.62	4.60	4.53
<u>SD</u> =	.39	.42	.41	.43

Homogeneity of variance was assured by an F value of 1.06 as determined between the extreme sample variances. This occurred in the high-level females and the lower-level males. This is presented in Table 13.

Table 13
Results of the Test for Homogeneity of Variance
in the Analysis of Dynamic Interaction

Highest sample variance	22.79 (High-level females)
Lowest sample variance	21.45 (Lower-level males)
F value	1.06 (n.s.)

The 2 x 2 factorial ANOVA to determine whether significant differences in dynamic interaction prevailed as to sex, performance level, or both of these factors among these subjects, revealed the results reported in Table 14.

The results of the analysis on dynamic interaction show a patterned similarity to those for mastery of skill. Again, the highest F value (1.06) is for the performance level factor. But even though the mean scores for the males are higher (see Table 12), they are not statistically significantly higher. Similarly, as in the analysis of n Ach levels, the combination of sex and performance level shows no interaction effect. It can, therefore, be concluded that these female and male gymnasts, regardless of their levels of performance, show no significant differences with respect to their motivational tendency toward dynamic interaction.

Table 14
Results of the Analysis of Variance
on Dynamic Interaction

Source	<u>df</u>	<u>SS</u>	<u>MS</u>	<u>F</u>
Within	116	19.76	.17	
Between	(3)			
Factor 1 (sex)	1	.13	.13	.76 (n.s.)*
Factor 2 (level)	1	.18	.18	1.06 (n.s.)*
Interaction	1	.00	.00	.00
Total	119	20.07		

* $F(1,116) = 6.88, p < .01; 3.93, p < .05.$

The fact that DI accounted for the lowest score of the motivational tendencies for each group may indicate that social interaction is of little concern in an individual sport. The lack of social interaction during performance by virtue of the nature of the sport of gymnastics may also account for this.

Although a low DI score may seem to run counter to an individual's desire to contribute to the maintenance of a group (see definition of terms), it would appear that good performance as possibly influenced by the MS factor could serve to offset such a notion. The performance effort of each gymnast which contributes collectively to either a satisfactory team performance or team win might, therefore, serve to hold or help hold the group together.

Self-regard. As in the case of the two previous motivational tendencies, basic statistics were necessary to compute for the analysis on self-regard. These are presented in Table 15, while the raw scores for SR are shown in Appendix 0.

Table 15
Basic Statistics Summarized from
Self-Regard Scores

	Lower-level males	Lower-level females	High-level males	High-level females
<u>N</u> =	30	30	30	30
ΣX =	160.30	161.95	161.20	160.90
ΣX^2 =	860.43	878.86	869.63	869.77
<u>M</u> =	5.34	5.40	5.37	5.36
<u>SD</u> =	.37	.40	.34	.48

Homogeneity of variance was again established in that an F value of 1.02 was obtained between the lower-level females and lower-level males, the two groups having the most extreme sample variances. This is presented in Table 16.

As in the case of the analysis of the two previous motivational tendencies, a 2 x 2 factorial ANOVA was made to determine whether significant differences would be found in these subjects for self-regard with respect to their sex, performance level or both of these factors. The results are shown in Table 17.

Table 16
Results of the Test for Homogeneity of Variance
in the Analysis of Self-Regard

Highest sample variance	30.31 (Lower-level females)
Lowest sample variance	29.67 (Lower-level males)
<u>F</u> value	1.02 (n.s.)

Table 17
Results of the Analysis of Variance
on Self-Regard

Source	<u>df</u>	<u>SS</u>	<u>MS</u>	<u>F</u>
Within	116	18.75	.16	
Between	(3)			
Factor 1 (sex)	1	.015	.015	.13 (n.s.)*
Factor 2 (level)	1	.00	.00	
Interaction	1	.035	.035	.19 (n.s.)*
Total	119	18.80		

* $F(1,116) = 6.88, p < .01; 3.93, p < .05.$

As in the analyses of MS and DI, no real differences were to be found between the sexes, performance levels, or both of these factors combined for these subjects' motivational tendency toward self-regard. In addition, the results showed that these subjects varied the least

in SR as indicated by .06 of a point existing between the extreme means of the four groups. Since all three motivational tendencies for a subject were obtained from the same Q sort, independence of these measures does not prevail, hence, statistical significance can not be ascertained. Nevertheless, a consistent pattern occurred throughout the analysis of these subjects' Q sorts. Regardless of sex or performance level, the same rank order prevailed; namely dynamic interaction, mastery of skill, and self-regard. Moreover, the same rank order and relative strength of the motivational tendencies for these subjects are essentially the same for those of Berlin's (1971) in her reliability study of her Q sort. The above-mentioned comparisons are presented in Tables 18 and 19.

Table 18
Group Means, Difference Between Extreme Means, and
Total Means for the Motivational Tendencies

Group	Motivational Tendencies		
	DI	MS	SR
Lower-level males	4.68	4.98	5.34
High-level males	4.60	5.02	5.37
Lower-level females	4.62	4.99	5.40
High-level females	4.53	5.10	5.36
Total means	4.61	5.02	5.36
Difference between extreme means	.15	.12	.06

Table 19
 Total Means of the Three Motivational Tendencies
 in the Berlin and Present Studies
 Shown for Comparison

Motivational Tendency	Berlin	Present Study
Self-regard	5.30	5.36
Mastery of skill	5.11	5.02
Dynamic interaction	4.70	4.61

On the basis of the predominantly high self-regard scores reflected by the gymnasts in this study, it seems plausible to typify gymnasts (male and female) as ego-involved, self-sufficient, and self-confident. That the factor of self-regard looms as a vital component in one's sport participation and achievements therein is given credence by recent investigations. A study by Williams et al. (1970) into the personality traits of champion level female fencers showed them to have a strong need to be independent, self-sufficient, and autonomous, but less disposed toward affiliation with groups. Top level female fencers were also shown to have a high disposition toward dominance and to possess a high desire for leadership and achievement. An investigation by Snyder and Kivlin (1975) regarding aspects of psychological well-being and body image of female athletes revealed high positive self-attitudes among gymnasts.

It is not surprising that these gymnasts scored highest on the factor of self-regard upon this writer's reflection as a competitive gymnast and coach. Similar to the assumption expressed regarding mastery of skill is the accountability of a gymnast's performance--his or hers alone. While a poor performance can embarrass an individual, a good performance can enhance the individual's ego. It is plausible, therefore, that regard for self would be of much concern to a gymnast.

Mastery of Skill Between Male and Female Gymnasts with Scores Corrected for Differences in n Ach

The purpose of this phase of the analysis was to determine the relationship between the male and female gymnasts' motivational tendency toward mastery of skill when taking into account differences in n Ach. The statistical technique required for this was the analysis of covariance (ANCOVA).

ANCOVA provides a measure of the relationship between sets of scores. The procedure entails a testing of the significance of the differences between the means of final experimental data by taking into consideration the correlation between one variable and one or more covariates.

The object of this analysis, therefore, was to ascertain any differences between the motivational tendency toward mastery of skill for male gymnasts and female gymnasts after correcting for differences in their scores for n Ach, the covariate. This required combining the MS scores as well as the n Ach scores of the experimental groups

(high level and lower level), for males and females alike.

The employment of covariance analysis involves many assumptions that must be met. Specific to this problem are three assumptions that must be checked. First, it is assumed that male and female gymnasts have the same mean n Ach level. Secondly, it is assumed that the relationship between the motivational tendency toward mastery of skill and n Ach level is the same for both sexes. And thirdly, it is assumed that a strong relationship exists between mastery of skill and n Ach level. In performing statistical tests to check these, it was found that these data give no reason to doubt the first and second assumptions. However, the third assumption is not supported by these data. Upon regressing mastery of skill on n Ach for males and females, the pooled slope estimate is 0.037 with an estimated standard error of 0.023 (117 degrees of freedom). This led to the conclusion that the covariate, n Ach level, does not help to explain the variation in mastery of skill scores.

Performing the analysis first without the covariate (n Ach level), then with the covariate will serve to illustrate the nature of the relationship discussed above. Prior to this, however, certain statistics need to be identified along with the listing of the basic statistics from which the analysis was generated. For this problem, these statistics and their values are shown in Tables 20 and 21.

Table 20
 Basic Statistics from n Ach and Mastery of Skill Scores
 Summarized for the ANOVA and ANCOVA Models

<u>For X</u>		<u>For Y</u>		<u>For XY</u>	
\underline{N}	= 60	\underline{N}	= 60	ΣXY_1	= 1699.45
ΣX_1	= 339	ΣY_1	= 300.05	ΣXY_2	= 1834.70
ΣX_2	= 363	ΣY_2	= 302.70	$\Sigma \Sigma XY$	= 3534.15
ΣX_t	= 702	ΣY_t	= 602.75		
ΣX_1^2	= 2003	ΣY_1^2	= 1508.5825		
ΣX_2^2	= 2313	ΣY_2^2	= 1531.8700		
ΣX_t^2	= 4316	ΣY_t^2	= 3040.4525		
\underline{M}_1	= 5.65	\underline{M}_1	= 5.0008		
\underline{M}_2	= 6.05	\underline{M}_2	= 5.0450		

Note. X = n Ach;
 Y = mastery of skill;
 XY = cross products;
 Subscript 1 = males;
 Subscript 2 = females.

Table 21
Sums of Squares and Cross Products of
n Ach and Mastery of Skill Data
for the ANOVA and ANCOVA Models

<u>For X</u>	<u>For Y</u>	<u>For XY</u>
$t_{xx} = 4.8$	$t_{yy} = .0585$	$t_{xy} = .5300$
$E_{xx} = 204.5$	$E_{yy} = 12.8310$	$E_{xy} = 7.5325$
$T_{xx} = 209.3$	$T_{yy} = 12.8895$	$T_{xy} = 8.0625$

Note.

t = source of variance between sexes;

E = source of variance within sexes;

T = total source of variance;

xx = high and lower performance levels of both sexes for n Ach;

yy = high and lower performance levels of both sexes for mastery of skill;

xy = cross products.

Given the above values, in performing the analysis for question three without the covariate (n Ach), that is, via a one way ANOVA, the following results were obtained.

Table 22
Analysis of Variance for Mastery of Skill

Source	<u>df</u>	<u>SS</u>	<u>MS</u>
Between sexes	1	.0585	.0585
Within sexes	118	12.8310	.1087
Total	119	12.8895	

Similar results were obtained in performing the analysis with the covariate (n Ach), that is, via ANCOVA as indicated by the following.

Table 23
Analysis of Covariance for Mastery of Skill

Source	<u>df</u>	<u>SS</u>	<u>MS</u>
Between sexes	1	.0254	.0254
Within sexes	117	12.5535	.1073
Total	118	12.5789	

The higher n Ach mean of the female gymnasts (6.05 versus 5.65) and their slightly higher mastery of skill mean (5.0450 versus 5.0008) were not substantially higher than for males. This is borne out by the extremely low mean squares that resulted. By inspection, it is quite obvious that no significance existed. The results of the analyses,

therefore, indicated that the variation in mastery of skill scores occurs apart from any effective influence of n Ach. This is obvious in that either analysis (with and without the covariate), revealed mean squares within the groups that were low and essentially the same (.1087 versus .1073).

Although correlations between MS and n Ach were found for males and females, they were low (r for males = .16; r for females = .14). The relationship between mastery of skill and n Ach, therefore, proved to be a weak one. This was evidenced by a regression that yielded a coefficient (within group pooled slope estimate) of only .037. Moreover, the estimated standard error of .023 for this slope, being of nearly the same value as the slope itself, clearly shows the lack of effect n Ach has upon mastery of skill for these subjects. Put another way, the data analysis in which the sums of squares for mastery of skill are adjusted (corrected) for regression on n Ach via ANCOVA show that mastery of skill advances only .037 of a unit for every unit increase in n Ach (Guilford, 1965), thus describing a slope close to zero. This is shown graphically in Figure 1.

Visualizing the two unadjusted Y means being moved along lines parallel to the general slope ($\beta = .037$), a comparison could then be made between these means on the \bar{X} ordinate (after adjustment). The slope, however, has such a small incline that it obscures this comparison. Hence, the means after adjustment would be shown to be very close to each other, in the same direction, but low in magnitude, thereby revealing the weak relationship between mastery of skill and n Ach.

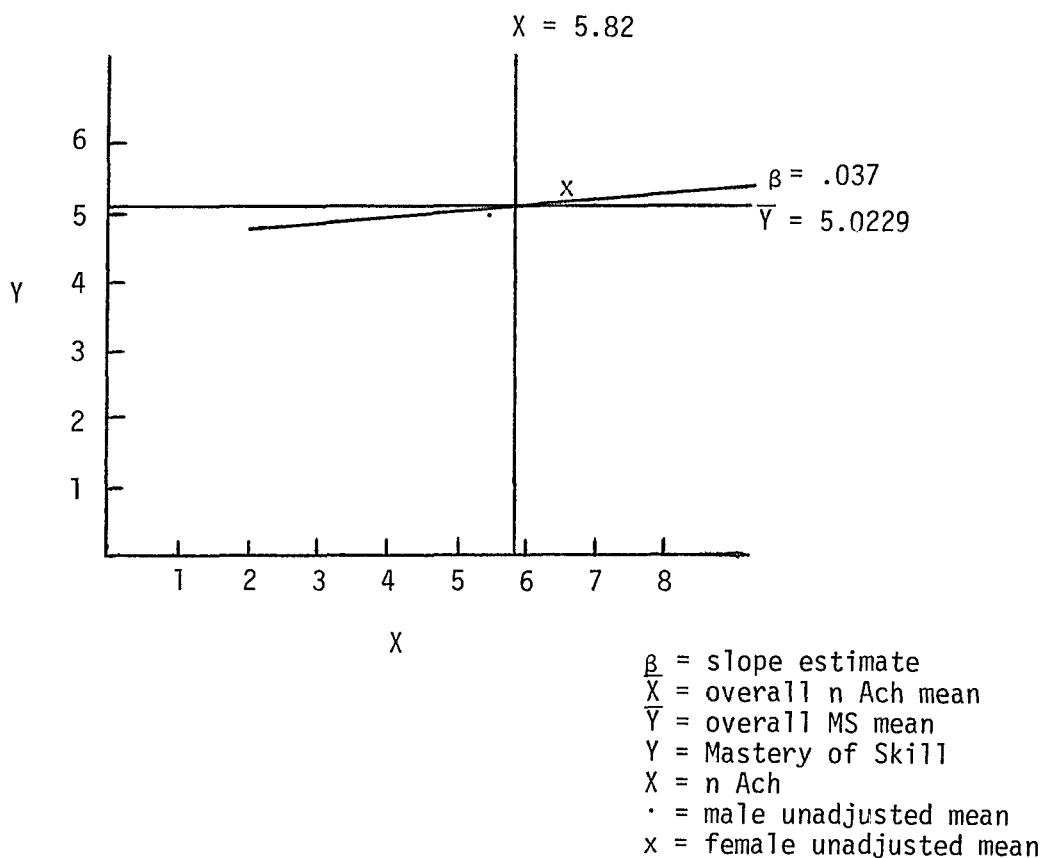


Figure 1. Relationship of Mastery of Skill to n Ach

Another point to consider in this analysis is that an F ratio for determining whether the true linear regression or slope was zero (an assumption of ANCOVA holds that regression is linear and the slope is not zero) yielded a value of 2.59 which was not statistically significant ($F_{1,117}$). It might be reasonable to conclude, therefore, that covariance analysis was not necessarily vital (Hicks, 1973) for showing that the covariate n Ach had negligible effect on mastery of skill for these subjects.

The lack of relationship between n Ach and mastery of skill might be explained by the higher scores yielded for the tendency toward self-regard than for mastery of skill. Reflected here would be the gymnasts' concern to perform well for the primary purpose of enhancing self rather than for the perfection of performance skills, and skill mastery then becomes a concomitant of the motivation toward self-regard. It would thus appear that the motivational tendency toward mastery of skill is an integral part of the motivation to enhance self (self-regard.) In this respect, the efficacy of the Berlin Q Sort on sport motivation is upheld in this study.

CHAPTER V

CONCLUSION

Summary

The objective in this investigation was to ascertain whether differences existed between male and female collegiate gymnasts representing both high and lower-level performance on high-performing teams with respect to 1) their need for achievement and 2) their motivational tendencies with regard to a) mastery of skill, b) dynamic interaction, and c) self-regard. A third inquiry was made asking whether n Ach might account for the degree to which a gymnast is predisposed in his/her motivational tendency toward mastery of skill. N Ach was assessed via the Lynn Achievement Motivation Questionnaire, while the Berlin Q Sort was used for the purpose of obtaining measures of the subjects' motivational tendencies.

One hundred and twenty men and women collegiate gymnasts from among high-level teams served as subjects for this study. Men and women alike whose mean gymnastics performance scores for a season lay to left of the median in the distribution of mean scores were classified as lower level performers. Similarly, men and women gymnasts whose mean performance scores for a season lay to the right of the median were classified as high level performers. The median score in the distribution of the male gymnasts' performance scores was 8.590 while the female gymnasts' median score was 7.845. Thus, four groups,

each comprised of 30 subjects were involved: high-level male performers, high-level female performers, lower-level male performers, and lower-level female performers.

N Ach levels. N Ach scores were analysed by the use of a 2 x 2 factorial analysis of variance. The results of the analysis showed that no differences in levels of n Ach were evident between the sexes, between the performance levels of the gymnasts within or between the sexes, or for the combined effect of sex and performance level.

Motivational tendencies MS, DI, SR. Each of the three motivational tendencies: mastery of skill (MS), dynamic interaction (DI), and self-regard (SR), was analysed by the use of a 2 x 2 factorial analysis of variance. The results of the analysis on these three motivational tendencies showed that no real differences were to be found among these subjects with respect to sex, performance level, or the combined effect of sex and performance level.

Mastery of skill when correcting for differences in n Ach scores. An analysis of covariance was undertaken to determine the relationship between the male and female gymnasts' motivational tendency toward mastery of skill after adjusting for differences in their n Ach measures. In doing so, the performance level groups (high-level and lower-level) for each sex were combined. Thus two groups, each comprised of 60 men and 60 women gymnasts with their attendant scores for n Ach and mastery of skill, were involved in covariance analysis.

The results of the covariance analysis revealed that the men and women gymnasts were similar in n Ach level and that the correlation between mastery of skill and n Ach was similar for both sexes. No relationship, however, was evident between mastery of skill and n Ach.

As revealed by the analysis of the data on n Ach and the motivational tendencies, the males and females as well as their performance levels, showed a consistent similarity. A factor clearly revealed throughout the analyses of these data show that these subjects are motivated highest in the tendency toward self-regard, secondly in mastery of skill, and with dynamic interaction showing the lowest motivational tendency. This rank order prevailed for each of the four groups.

Similarity within and between the sexes was also revealed in the covariance analysis. The level of n Ach and the correlation between n Ach and mastery of skill was very much the same for males and females even though it was shown that the variation in mastery of skill for either sex could not be attributed to n Ach. Thus, these subjects were shown to be more alike than different in all measures.

Conclusions

The following conclusions are made in accordance with the answers found to the three broad questions as specified in Chapter I.

Question One: What differences, if any, are there in the levels of achievement motivation among and between male and female gymnasts classified as high-level and lower-level performers on high-performing collegiate competitive teams and measured by the Lynn Achievement Motivation Questionnaire?

Analysis of the n Ach data showed that no significant differences existed between high-level and lower-level performing male as well as female gymnasts. Nor were significant differences in n Ach revealed between male and female gymnasts in either the high-level or lower-level performance classification. Thus similarity in level of n Ach was indicated in each of the four groups.

The results of the n Ach analysis indicated that the subjects of this study were high in n Ach. In addition, the results are consistent with previous research which showed that high n Ach levels parallel good athletic performance. The fact that no differences in n Ach existed between male and female gymnasts dispelled the notion that women are disposed to a n Ach orientation which differs from that of men, a point that is supported by the lack of differences indicated in the motivational tendencies of these subjects.

Based on these findings, it is concluded that 1) high and lower-level performers on high-performing gymnastics teams strive equally for achievement, with the difference between the two performance levels being a matter of natural ability favoring the high-level performer over the lower-level performer; and 2) female gymnasts can be expected to show the same or higher level of n Ach and performance quality as male gymnasts, thereby making it imperative that equality in all aspects of gymnastics and other sports be accorded women.

Question Two: What differences, if any, are there among and between male and female gymnasts with respect to their motivational tendencies of 1) mastery of skill, 2) dynamic interaction, and 3) self-regard as revealed from their responses to the Berlin Q Sort?

Analysis of the three motivational tendencies showed that no significant differences existed between high-level and lower-level performing male as well as female gymnasts. Nor were significant differences in any of the three motivational tendencies found between male and female gymnasts in either the high-level or lower-level performance classification. Thus, a consistency of no differences prevailed for each of the four groups in all three motivational tendencies.

The results of the analysis on the motivational tendencies revealed that each of the four groups displayed the same profile regarding sport motivation, namely that each group was lowest in their motivational tendency toward dynamic interaction, second highest in their motivational tendency toward mastery of skill, and highest in their motivational tendency toward self-regard. Moreover, the groups were more similar in their tendency toward self-regard than in the other two tendencies, a finding that reflected the import of self in competitive sports as noted in previous research. The fact that no differences in the motivational tendencies were found between the sexes also indicate that men and women enter into their sport experiences with similar feelings.

Based on these findings, it is concluded that high and lower-level performers on high-performing gymnastics teams are motivated primarily toward self-regard and with the same intensity in this measure in their sport experiences. In addition, the fact that these men and women were essentially the same in each of the three tendencies and that they exhibited the same rank order in these motivational tendencies make it

imperative that women be accorded the same opportunity for participation in competitive gymnastics and other sports as for men.

Taking the above into account, some implications for coaching are evident. One case in point would be the athlete who obtains a score in dynamic interaction that is higher than his/her score in either self-regard or mastery of skill. The need for counsel by the coach would seem to apply in this instance, particularly if this involved a highly talented performer. In this case, the coach could emphasize pride in self as a motivational technique. Further considerations would be the use of the rank order of the motivational tendencies (SR--1st, MS--2nd, and DI--3rd) as a guideline for team selection or for identifying those personnel which may need attention toward the improvement of skills. In addition, the question of a motivational topology indigenous to gymnasts in general occurs upon considering that a consistency of no differences prevailed throughout the four groups in each of the three motivational tendencies. A coach would, therefore, look for best results from those whose motivational tendencies exhibit the rank order just noted above.

Question Three: What is the relationship if any, between male and female gymnasts' motivational tendency toward mastery of skill when correcting for differences in their scores for achievement motivation?

The results of a covariance analysis showed that the covariate, n Ach, had negligible effect on mastery of skill for males and females alike. A regression coefficient of only .037 indicated the weaknesses

of any relationship between mastery of skill and n Ach. The analysis did reveal that male and female gymnasts had the same mean n Ach level and the same degree of relationship (low) between mastery of skill and n Ach. This indicates that these male and female gymnasts are more alike than different.

The fact that a weak relationship existed between mastery of skill and n Ach ruled out any effective influence of n Ach on motivation toward mastery of skill for these gymnasts. Thus, the slight variance in mastery of skill for these subjects could not be attributed to their need for achievement. It is, therefore, concluded, that another factor may be operating that accounts for one's tendency to be motivated toward mastery of skill.

The similarity which prevailed between the sexes in this analysis as in the analyses of the two previous questions, points up to the seeming lack of differences in which male and female gymnasts are oriented to their sport. Moreover, this may well apply for female and male athletes in general. Based on this conclusion, there is sufficient reason to provide for equity in all facets of sport for both sexes. This would certainly apply in the sport of gymnastics upon taking into consideration the fact that the national women's gymnastics team currently surpasses the men's team as pointed out in the review of literature.

Considerations for Further Study

The results of this study bring to focus four considerations that appear worthy of investigation. The first involves a replication of

this study with gymnasts of lower level teams. A second consideration would be to replicate this study with athletes of other individual sports. A third enterprise would be the replication of this study with team sport athletes.

A fourth consideration could be given to an investigation into the notion of sport typologies. For example, the results of a study by Johnsgard and Ogilvie (1968) showed the emergence of several sport types. The particular topic of concern in this inquiry would be comparisons of the rank order of motivational tendencies revealed in a given sport with personality traits assessed via such inventories as the Edwards Personal Preference Schedule, the Cattell 16 PF, and the Athletic Motivation Inventory. It would be of interest to find out which personality factors are characteristic of gymnastics. For example, Kroll (1967) reported that an aesthetic orientation within the gymnast's personality may account for the person to be attracted to the sport. Kagan and Moss (1962) considered the existence of a possible link between the need for recognition and n Ach on the basis of finding a high positive correlation between the two. They further noted that persons who have strong needs for mastery and competence tend to be involved in achievement-oriented activity. Lenk (1971) suggested that since achievement in sport is a personal matter realized through self involvement, sport is, therefore, representative of personality development.

If there is any credence to the notion that certain personality factors predispose one to a particular type or types of sports, it

would be an aid in providing psychological rationales for sport per se and for one's choice of activity and degree of involvement in that activity. In turn, this would provide for some principles upon which coaching techniques could be applied.

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APPENDIX A

Letter to coaches requesting participation in the research problem of this study.

Dear

I am making an appeal to you for help in my doctoral research. I have chosen a topic with the view in mind of contributing to gymnastics. I must, however, depend upon the willingness of yourself as well as other coaches of nationally ranked teams to participate. The success of the project depends entirely on this factor. Will you help me?

The enclosed cover sheets, intended for posting on the team bulletin board as a reminder, briefly conveys the nature of the research. You might wish to read this cover sheet before continuing this letter.

Since your team had the high ranking it made last season, the inclusion of your gymnasts would be representative of the subjects (national calibre) my study requires. The fact that some schools are a distance that makes travel from here to there very impractical, compels me to ask those coaches or one of their administrative assistants to administer the two inventories. I am financially able to travel only in the northeast where I personally can do the administration of the inventories. The instructions and the test procedures are very clear and quite simple.

These instructions along with all test materials will be sent to such coaches at my expense for the postage. I will also bear the cost for the postage upon returning all materials.

Aside from the data collected via the two inventories, I will also need average performance scores computed over the 1974-75 season. All you need to do is send me your dual meet results; I do the computations. Postage for this will also be borne by me.

Thus far, I have commitments from several of your colleagues; can I also count on you? Needless to say, a positive response from you will be very much appreciated.

Please let me hear from you as soon as you can.

Very truly yours,

Joseph F. Fodero,
Assistant Professor,
Gymnastics Coach

APPENDIX B

Cover Sheet Sent To Coaches With Letter Requesting Participation in the Study.

** R E S E A R C H A B O U T G Y M N A S T I C S **

Sport Motivation Research by Joe Fodero, Gymnast, Coach, Teacher - State University College, Oneonta, New York. Doctoral Candidate - University North Carolina, Greensboro.

PURPOSE:

1. To Assess The Sport Motivation Levels of NATIONAL CALIBRE Men and Women Collegiate Gymnasts.
2. To Determine The Relative Strengths of Motivational Tendencies of Potential Champions:
 - a) Performance
 - b) Self-Regard
 - c) Dynamic (Social) Interaction
3. To Determine Whether SEX DIFFERENCES EXIST In The Motivational Tendencies Among HIGHLY SKILLED Gymnasts.

VALUE:

1. To Help The Gymnastics Coaching Profession Better Understand Potential Champion Performers' Motivational Levels and Tendencies.
2. To Enable The Coach To Guide His/Her Gymnasts Toward More Successful Performance By Utilizing Knowledge About The Athlete's Personal Motivational Tendencies.

TEST ITEMS:

1. A 60-Item Q Sort: Approximately 45 Minutes To Sort 60 Self-Referrent Statements Into 11 Stacks.
2. An 8-Item Questionnaire: Approximately 2 Minutes.

NEEDED:

Serious-Minded Gymnasts Who Want To Make A Contribution To The Body of Knowledge In and For Gymnastics. Can This Former Gymnast Count On YOU?

TEST SCHEDULE

College/University Date(s) Time(s) Bldg./Room

APPENDIX C

Check List of Items in the Packet Sent to Coaches

P A C K I N G L I S T - P L E A S E C H E C K

Included in this package are all the materials needed, both to administer the two inventories, and to ship via return mail, all test materials and results.

Items include:

1. Twelve sheets of the 8-item questionnaire.
2. Twelve Q decks (sets of the 60-item Q sort, one statement per 3 x 5 card).
3. One sheet labeled Procedure for Administering the 8-Item Questionnaire and the Q Sort.
4. Twelve sheets with a diagram of boxes upon each.
5. Thirteen sheets labeled, Directions for Q Sorting.
6. Twelve pencils.
7. Wrapping paper, packaging tape, and return postage.
8. Twelve self-addressed, stamped envelopes for sending dual meet results.

PLEASE RETURN ALL MATERIALS AS SOON AS POSSIBLE UPON COMPLETING THE ADMINISTERING OF THE TWO INVENTORIES. PLEASE SEND YOUR DUAL MEET RESULTS AFTER EACH DUAL MEET. THESE ARE IMPORTANT AS THE PERFORMANCE SCORES ARE NEEDED TO COMPLETE THE ANALYSIS.

APPENDIX D

PROCEDURE FOR ADMINISTERING THE
8-ITEM QUESTIONNAIRE AND THE Q SORTTHE QUESTIONNAIRE

A portion of the 12-item Lynn Achievement Motivation Questionnaire (the single sheet with the 8-item YES-NO Responses) is administered FIRST. Distribute one questionnaire and one pencil to each gymnast. Directions on the questionnaire itself are self-explanatory.

Be certain that each gymnast has his/her name or initials PRINTED on the top right of the questionnaire along with the school name and sex before collecting them. These names/initials must match what they will use on the Q sort as well as that which is used on the score sheets of the team's dual meet results.

THE Q SORT

Chairs and long tables are preferred for the sorting of 60 statements (one per 3x5 card) into 11 stacks. Broad arm-deck chairs will do if tables are unavailable, or for that matter, so will the floor, although this would not be as comfortable.

After collecting ALL the 8-item questionnaires, distribute to each gymnast: 1) one Q deck (the 60 statements on 3x5 cards), 2) one diagram of boxes, and 3) one sheet labeled, Directions for Q Sorting. The gymnasts will have pencils to record their sorts in the diagrams by virtue of doing the questionnaire first. Then call the attention of the gymnasts and ask them to follow you silently, your reading aloud the

"Directions for Q Sorting." After doing so, ask if all understand what to do or whether there are any questions. When assured all is clearly understood, tell the gymnasts to begin.

Again, be certain that each gymnast has his/her name/initials (matching that used on the questionnaire and the team's dual meet results) PRINTED along with school name and sex on the top right of the sheet with the diagram of boxes before collecting them.

APPENDIX E

Lynn Achievement Motivation Questionnaire

NAME/INITIALS: _____

COLLEGE/UNIVERSITY: _____

SEX: _____

Answer All Questions, No Matter How Difficult.
 Mark An "X" In The "Yes" or "No" Space That
 Most Appropriately Represents Your Response.

RESPONSE

- | | | |
|--|---------|--------|
| 1. Do you find it easy to relax completely when you are on vacation? | YES ___ | NO ___ |
| 2. Do you feel annoyed when people are not punctual for appointments? | YES ___ | NO ___ |
| 3. Do you dislike seeing things wasted? | YES ___ | NO ___ |
| 4. Do you like getting drunk? | YES ___ | NO ___ |
| 5. Do you find it easy to forget about your work outside of normal working hours? | YES ___ | NO ___ |
| 6. Would you prefer to work with a congenial but incompetent partner, rather than with a difficult but highly competent one? | YES ___ | NO ___ |
| 7. Does inefficiency make you angry? | YES ___ | NO ___ |
| 8. Have you always worked hard in order to be among the best in your own class/activity? | YES ___ | NO ___ |

APPENDIX F

Berlin Q Sort Statements *

1. Sometimes I don't think I'm really good enough to reach my goals.
2. In sport, I am able to act as I feel.
3. My belief in myself influences me to do many of the things I choose to do.
4. I like to be selected as "the leader."
5. It is hardly worthwhile, nowadays, to try to be "socially accepted."
6. I take pride in being an athlete.
7. I have been able to cultivate many friendships as a part of my sport involvement.
8. My self-reliance has been enhanced by my sport experiences.
9. Sport provides a way for me to continue some of my early interests.
10. I like the discipline of training.
11. Once a contest gets under way, I'm too involved to be aware of my nervousness.
12. It is important to work for perfection.
13. It is difficult for me to accept failure.
14. Sport makes it possible for me to realize my ambitions.
15. I trust myself to avoid serious injury.
16. Although practice is time-consuming, it gives me a feeling of accomplishing something.
17. It is hard to be aggressive against a likeable opponent, e.g., one who is kind and acts friendly.
18. I am determined to be a success.
19. I cannot share my loneliness as an athlete with others who are not athletes.

20. My desire to perform is interfered with due to the build-up of pressure just prior to competition.
21. I organize my life effectively to allow for my sport participation.
22. I rarely feel unsure of myself in sport as I do in other situations.
23. I make strong demands on myself and take pride in doing so.
24. In the closing moments of a close contest, the importance of scoring high becomes another element of concern.
25. Rationalization is occasionally necessary in sport.
26. I can tolerate the loneliness that results from spending a lot of time in athletic training.
27. It is rough to keep in shape out of season.
28. I recognize when I "deserve" to lose.
29. "Chance things" over which I have no control, come to my mind just before a big event.
30. I like proving that I am skilled by competing in sports.
31. I have the capacity to recover easily from failures that occur in my performance.
32. It is difficult for an athlete to continue friendships.
33. Nobody can give 100% all of the time.
34. Playing and/or practicing provides a "release" that makes me feel good.
35. It is important that I am liked by the opposite sex.
36. I strive to be "the best."
37. I have confidence about my insights into certain sport situations.
38. I know what is best and I can give it in the excitement of competition.
39. When I feel that I at least performed well, I don't mind losing.
40. I don't drive myself in a contest unless I have to because I dislike doing it.

41. It takes more than sports participation to "escape" from personal pressures.
42. I keep my ambitions and abilities in good relationship.
43. Participation in sport keeps open a world of social experiences to me, e.g., travel, meeting new people, etc. . . .
44. I am usually able to find ways to do the things I like to do.
45. I don't mind extra workouts in order to gain more precise control of my skills.
46. My most important feelings cannot be readily translated into action.
47. To relieve my anxieties is hard work.
48. I feel proud when I engage in sport.
49. I am bothered all season long about the idea of losing or not doing well.
50. When I have to be a so-called "good loser," I disguise my innermost feelings.
51. In sport, I accept being told what to do by others.
52. I work steadily at satisfying my own performance standards.
53. I get "worked up" easily in a close contest.
54. I have particularly "close" feelings with my teammates.
55. Being an athlete causes me, at times, to feel like a social outcast.
56. I am a naturally nervous person.
57. There are special kinds of excitement and thrills that go along with participating in competitive sport.
58. I consider myself to be an emotionally controlled competitor.
59. Once I make up my mind to do something, I really work at it.
60. In order to be a winner, I know that I have to keep putting out more and more all the time.

* With statement numbers 19, 20, 24, 26, 29, 32, 40, 41, 49, and 55, revised by the writer.

APPENDIX G

Original Berlin Q Sort Statements Revised by the Writer

19. The loneliness of being an athlete cannot be shared with others.
20. The build-up of pressure just prior to competition interferes with my desire to perform.
24. In the closing moments of a game, time often becomes another element to be conquered.
26. There are worse things in life than being lonely.
29. Just before a big event, I think of the "chance things" that might happen that I cannot control.
32. A difficult thing for an athlete to do is to maintain friends.
40. I can drive myself when I have to in a contest although I do not like doing it.
41. Sport does not provide an "escape" from personal pressures.
49. The idea of losing "hangs" over me all season long.
55. Sometimes I think that as an athlete I am a social outcast.

APPENDIX H

DIRECTIONS FOR Q SORTING

THE TASK

You have: 1) a set of 60 cards, 2) a diagram of "boxes," and 3) a pencil. On each card there is a numbered statement explaining the way a person may think, act, or feel. Your task is to sort these statements according to the way each one describes YOU--as YOU perceive YOURSELF. You are, therefore, to arrange the 60 statements, placing those you consider to be MOST LIKE YOU at the LEFT END of the diagram; those that are LEAST LIKE YOU at the RIGHT END; and the REMAINDER falling somewhere BETWEEN. The result will be 11 stacks of cards.

There is no time limit. You are encouraged to take as much time as you need to make a thoughtful response. There are NO RIGHT OR WRONG answers. When finished, the sort will represent YOUR perceptions--obviously based on your own experiences.

SORTING

There is no special or required way of sorting. One suggested way is to first read each card and decide whether the statement describes you or not. Place LIKE ME cards on the LEFT; NOT LIKE ME cards on the RIGHT; UNDECIDED cards in the MIDDLE. Then find the ONE card in the LEFT stack that MOST describes you and set it aside. Do the same with the SECOND MOST LIKE YOU statement and place it with the first. Then, switch over to the LEAST LIKE YOU statements and locate the TWO cards that will be represented in column K on the diagram. Go through the

UNDECIDEDS and place them left or right after a "second thought." Then identify three statements each for column B and column J. Continue this process, working from each end until you have sorted all the cards.

RECORDING

The sort diagram contains 60 boxes organized into 11 columns which correspond to the 60 statements placed into 11 stacks. WHEN YOU ARE CONFIDENT ABOUT YOUR SORTING, RECORD THE STATEMENT NUMBERS IN THE APPROPRIATE BOXES OF THE DIAGRAM.

In the extreme left column A, record the numbers of the two statements that are MOST LIKE YOU: in column B, the three statements that are, in your judgment, next most like you; in column C, next most like you, and continuing likewise to column K. Do not use the same number twice. When you have completed the recording, there will be a number in each box of the diagram. (Numbers do not need to be listed in ascending order in a given column).

Be certain that your name or initials (whichever you elect to use) is on the diagram at the top right along with your school and sex. Your name or initials must match what you used on the previously answered YES - NO list of 8 questions as well as that which is used on the score sheets of your team's dual meet results.

PLEASE RETURN ALL CARDS, DIAGRAMS, PENCILS, THANK YOU!

APPENDIX J

NUMERICAL CONVERSION OF 60-ITEM SORTS

MALE _____ HIGH _____		School _____	S's Initials _____	Code # _____		
FEMALE _____ LOW _____						
1. _____ M		21. _____ M		41. _____ D		
2. _____ D		22. _____ R		42. _____ R		
3. _____ R		23. _____ R		43. _____ D		
4. _____ D		24. _____ M		44. _____ M		
5. _____ D		25. _____ R		45. _____ M		
6. _____ R		26. _____ D		46. _____ D		
7. _____ M		27. _____ M		47. _____ M		
8. _____ R		28. _____ R		48. _____ R		
9. _____ D		29. _____ M		49. _____ M		
10. _____ M		30. _____ M		50. _____ D		
11. _____ M		31. _____ R		51. _____ D		
12. _____ M		32. _____ D		52. _____ M		
13. _____ R		33. _____ M		53. _____ D		
14. _____ R		34. _____ D		54. _____ D		
15. _____ R		35. _____ D		55. _____ D		
16. _____ D		36. _____ M		56. _____ R		
17. _____ D		37. _____ R		57. _____ D		
18. _____ R		38. _____ R		58. _____ R		
19. _____ D		39. _____ R		59. _____ M		
20. _____ R		40. _____ M		60. _____ M		
	<u>MS</u>		<u>DI</u>			<u>SR</u>
TOTAL _____		TOTAL _____		TOTAL _____		
MEAN _____		MEAN _____		MEAN _____		

APPENDIX K

School _____

TALLY SHEET FOR RECORDING AND CALCULATING EACH
SUBJECT'S SEASONAL MEAN PERFORMANCE SCORE

_____|_____
S's Initials Code #

<u>MEET #1</u>	<u>MEET #2</u>	<u>MEET #3</u>	<u>MEET #4</u>	<u>MEET #5</u>	<u>MEET #6</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
TOT. _____	TOT. _____	TOT. _____	TOT. _____	TOT. _____	TOT. _____
<u>MEET #7</u>	<u>MEET #8</u>	<u>MEET #9</u>	<u>MEET #10</u>	<u>MEET #11</u>	<u>MEET #12</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
TOT. _____	TOT. _____	TOT. _____	TOT. _____	TOT. _____	TOT. _____
Total of Scores _____	No. of Scores _____		Mean Score for Season _____		

APPENDIX L

Raw Scores for n Ach

Subjects	Lower Level Males	High Level Males	Lower Level Females	High Level Females
1.	5	4	7	8
2.	6	6	7	5
3.	4	6	3	7
4.	6	5	6	6
5.	4	7	5	7
6.	5	6	8	7
7.	7	5	5	6
8.	5	6	6	5
9.	5	7	6	8
10.	6	2	5	4
11.	5	6	5	8
12.	7	7	8	7
13.	4	6	6	7
14.	3	8	5	8
15.	4	5	6	4
16.	6	6	6	5
17.	4	6	6	3
18.	6	6	5	6
19.	5	5	7	8
20.	7	7	8	4
21.	8	5	7	4
22.	5	5	6	4
23.	4	5	5	7
24.	7	5	6	7
25.	6	7	6	8
26.	7	8	6	8
27.	7	5	6	6
28.	6	6	2	6
29.	7	5	7	6
30.	5	6	7	6

Note. Since there were four groups there were four different subjects numbered 1, 2, and so on through 30. That is subject 1 for lower-level males, subject 1 for high-level males, etc.

APPENDIX M

Raw Scores for Mastery of Skill

Subjects	Lower Level Males	High Level Males	Lower Level Females	High Level Females
1.	5.25	5.20	4.80	5.60
2.	4.55	5.60	5.15	5.40
3.	4.35	4.85	4.65	5.10
4.	5.30	5.10	5.00	5.35
5.	4.25	5.10	4.85	5.00
6.	5.05	5.05	5.10	4.55
7.	5.20	4.55	5.65	4.65
8.	4.25	5.20	4.40	5.05
9.	5.15	4.30	5.15	4.80
10.	5.45	5.00	5.10	5.70
11.	5.10	5.25	4.65	5.40
12.	5.05	4.90	5.20	4.80
13.	4.95	4.80	5.15	5.15
14.	4.65	4.85	4.75	4.95
15.	5.10	4.85	4.70	4.85
16.	4.75	5.30	5.40	4.90
17.	4.85	5.70	5.00	5.10
18.	5.00	5.55	4.75	5.35
19.	5.15	4.50	5.25	5.05
20.	4.90	4.85	5.15	5.05
21.	5.30	4.90	5.00	5.20
22.	4.80	5.55	5.05	5.25
23.	5.20	4.85	4.70	5.40
24.	5.45	5.55	5.45	5.25
25.	5.55	5.40	5.00	5.25
26.	5.15	5.35	4.70	5.25
27.	4.70	5.00	5.40	4.65
28.	5.05	4.50	4.75	5.00
29.	4.75	5.15	4.85	4.85
30.	5.10	3.95	4.85	5.20

Note. Since there were four groups there were four different subjects numbered 1, 2, and so on through 30. That is subject 1 for lower-level males, subject 1 for high-level males, etc.

APPENDIX N

Raw Scores for Dynamic Interaction

Subjects	Lower Level Males	High Level Males	Lower Level Females	High Level Females
1.	4.15	4.40	4.20	4.70
2.	4.20	4.05	4.20	4.80
3.	5.50	4.25	4.95	5.45
4.	4.80	4.50	4.60	4.40
5.	5.35	4.70	4.75	4.20
6.	4.75	4.45	4.10	5.10
7.	5.25	5.10	4.10	5.20
8.	5.00	4.30	4.55	4.65
9.	4.50	5.10	4.70	4.65
10.	4.00	4.40	5.00	4.45
11.	4.20	4.65	4.70	4.95
12.	4.65	4.95	4.20	4.55
13.	4.85	5.25	4.70	5.00
14.	4.55	4.30	4.90	4.35
15.	5.10	4.40	5.75	4.80
16.	4.70	4.75	5.05	4.30
17.	5.05	4.40	4.25	4.05
18.	4.55	4.30	4.85	4.65
19.	4.15	4.50	4.15	3.95
20.	4.60	4.55	4.70	4.25
21.	4.00	4.70	5.10	4.30
22.	4.85	4.00	3.80	4.00
23.	4.50	4.85	4.55	4.20
24.	4.35	3.95	4.65	4.70
25.	4.90	4.60	4.45	4.50
26.	4.50	4.45	5.25	5.00
27.	4.95	5.60	4.05	4.85
28.	4.50	4.60	4.60	3.35
29.	4.90	4.45	4.85	4.25
30.	5.00	5.60	4.75	4.40

Note. Since there were four groups there were four different subjects numbered 1, 2, and so on through 30. That is subject 1 for lower-level males, subject 1 for high-level males, etc.

APPENDIX O

Raw Scores for Self-regard

Subjects	Lower Level Males	High Level Males	Lower Level Females	High Level Females
1.	5.60	5.40	6.00	4.70
2.	6.25	5.35	5.65	4.80
3.	5.15	5.90	5.40	4.45
4.	4.90	5.40	5.40	5.25
5.	5.40	5.20	5.40	5.80
6.	5.20	5.50	5.80	5.35
7.	4.55	5.35	5.25	5.15
8.	5.75	5.50	6.05	5.30
9.	5.35	5.60	5.15	5.55
10.	5.55	5.60	4.90	4.85
11.	5.70	5.10	5.65	4.65
12.	5.30	5.15	5.60	5.65
13.	5.20	4.95	5.15	4.85
14.	5.80	5.85	5.35	5.70
15.	4.80	5.75	4.55	5.35
16.	5.55	4.95	4.55	5.80
17.	5.10	4.90	5.75	5.85
18.	5.45	5.15	5.40	5.00
19.	5.70	6.00	5.60	6.00
20.	5.50	5.60	5.15	5.70
21.	5.70	5.40	4.90	5.50
22.	5.35	5.45	6.15	5.75
23.	5.30	5.30	5.75	5.40
24.	5.20	5.50	4.90	5.05
25.	4.55	5.00	5.55	5.25
26.	5.35	5.20	5.05	4.75
27.	5.35	4.40	5.55	5.50
28.	5.45	5.90	5.65	6.65
29.	5.35	5.40	5.30	5.90
30.	4.90	5.45	5.40	5.40

Note. Since there were four groups there were four different subjects numbered 1, 2, and so on through 30. That is subject 1 for lower-level males, subject 1 for high-level males, etc.