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The purpose of this study was to test a tentative theory of the motivation of women collegiate athletes as formulated by Berlin. The responses of 224 women athletes to a forced-choice, structured Q-sort were collected. Twelve colleges/universities and seven different sports were represented by the female competitors. Sort responses were factor analyzed by means of a principal component analysis. The initial factor matrix was rotated using the Varimax rotation criterion. Fifteen rotated factors, accounting for 49.9% of the total variance, were identified as essential components in the structure of collegiate women's motives to engage in competitive sport. These factors were designated: (a) commitment to goals, (b) coping with failure, (c) skill-related adjustment, (d) responsiveness to pressure, (e) self-confidence, (f) sociability, (g) release, (h) ego-gratification, (i) belongingness, (j) anxiousness, (k) adventure, (l) self-interest, (m) effectiveness, (n) social accommodation, and (o) conflict adaptation. Results supported the horizontal structure of the model as conceptualized by Berlin, but did not validate the vertical structure. Implications of these findings for the restructuring of the model were discussed, and a revised model was presented.

A FACTOR ANALYSIS OF THE MOTIVATION OF
WOMEN COLLEGIATE ATHLETES

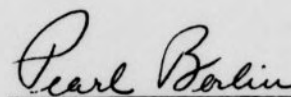
by

Gladys Smith

A Thesis Submitted to
the Faculty of the Graduate School at
The University of North Carolina at Greensboro
in Partial Fulfillment
of the Requirements for the Degree
Master of Science in Physical Education

Greensboro
1975

Approved by



Thesis Advisor

APPROVAL PAGE

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

However, during the development and completion of this study.

The writer is also indebted to Mrs. Eugene L. Galt, and

Mrs. J. H. Thompson for their interest, encouragement, and

aid in the completion of this thesis.

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CHAPTER I

INTRODUCTION

Probably no segment of competitive sport has experienced such dramatic change in recent years as women's athletics. The woman athlete, although not yet attaining universal acceptance or social respectability, is an undeniable element of the sport scene in nearly every sport and at all levels of competition. Woman's role in sport is one that has recently won legal support and one in which the public has become increasingly interested and concerned. This is not to imply that there is anything new about women competing in sport; the first intercollegiate basketball game was played in 1896 and the first intercollegiate hockey game, near the turn of the century (Gerber, Felshin, Berlin, & Wyrick, 1974). However, there is nothing in the history of women's sport in the U.S. to compare with the rapid growth and increased popularity that women's athletics is now experiencing. More and more girls and women are striving for excellence in sport competition. Newspapers, magazines, and television report their accomplishments to an ever-increasing number of women's sport fans--both male and female. Women's athletics has become "an important contemporary phenomenon in American society (Poindexter and Mushier, 1973, p. 1)."

One of the most interesting and essential questions to be answered about this social phenomenon, women's athletics, is "Why do women participate in competitive sport?" Sport motivation has been established as a major concern

among sport psychologists in recent years, but most studies focus on the male competitor. The present status of women's athletics suggests that it is appropriate to investigate the motivations of women athletes.

To simply enumerate the purported reasons why women participate in athletics gives no in-depth understanding of sport motivation. Only by organizing the reasons into a valid, meaningful structure can knowledge of these behavioral influences be gained. Such an approach was used by Berlin (1971, 1972b, 1973) in a series of exploratory studies of female athletes' motives. Her investigations have given impetus and direction to the study of women's sport motivations; the present inquiry can be considered an outgrowth of Berlin's efforts to delineate a structure of the motivation of women collegiate athletes.

Background Research

Berlin's (1971, 1972b, 1973; Gerber et al., 1974) investigation of the motivations of women collegiate athletes is unique in the research literature concerning women's sport motivation because of the research strategy employed: model-building. Her inquiries represent an attempt to define the motivational dispositions of women athletes in terms of a consistent, integrated structure.

In the initial study, Berlin (1971) formulated a tentative theory of the motivation of women collegiate athletes based on accepted ideas from personality theory and sport literature. Achievement motivation, as conceptualized by McClelland (1961; McClelland, Atkinson, Clark & Lowell, 1953) and further developed by Atkinson (1958), Atkinson and Feather (1966), Heckhausen (1967), and Maehr (1973), was designated as the broad frame of reference for the theory.

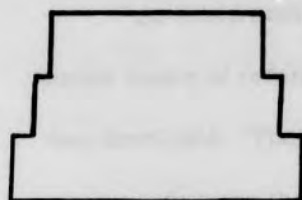
Four pervasive motive categories purportedly describing competitive sport were identified: (a) contribution to self-regard, (b) the enabling of self-expression, (c) opportunities for social interaction, and (d) the challenge of mastery. Positive affects and negative affects represented the behavioral dispositions that are associated with sport as an achievement-oriented experience. Two descriptive modes of behavior were specified: (a) general life experiences and (b) specific sport-oriented situations. A 16-cell hypothetical model describing college women's motives to engage in competitive sport and embodying all of the above components was formulated.

The next step in the process of model-testing was the development of an instrument to test the theory. Deciding in favor of a direct measure rather than a projective one, Berlin (1971) used a variation of Stephenson's (1953) Q-technique to determine the responses of women athletes to the ideas embodied in the theory. An 80-item forced-choice Q-sort was structured; each cell of the model was represented by five statements in the sort. Original statements in the sort were obtained from two sources: (a) direct responses by women athletes to questions about why they participated in sport, and (b) literature which speculates as to the reasons for women's involvement in sport (Berlin, 1972, p. 1).

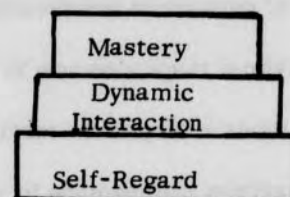
The sort was administered to 212 women collegiate athletes representing seven colleges/universities and more than a dozen sports. Following the procedures recommended by Kerlinger (1964), subjects sorted the statements along an 11-point self-reference continuum ranging from "Most Like Me" to "Least Like Me." Numerical values were assigned to the statements according to

placement along the continuum. Sort values were tested for significant differences and factor analyzed.

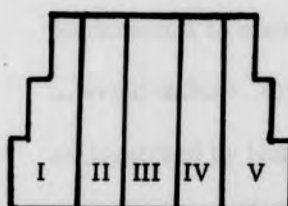
The results of this analysis had several implications for the restructuring of the hypothetical model. No significant difference existed between the motive categories, self-expression and social interactions; thus, the number of basic motive categories was reduced to three. The data suggested that subjects did not differentiate between motives that purportedly influenced involvement in sport and those that directed general life behavior. Berlin concluded that the designation of descriptive modes could be eliminated from the model. The clustering of positive affect statements at the "Most Like Me" end of the continuum and the clustering of negative affect statements at the "Least Like Me" end was predicted. However, their placement revealed an interesting and important pattern: a theme of personal responsibility in relation to the athlete's performance was reflected. This finding, according to Berlin, made the consideration of internal versus external control essential in the restructuring of the model (1971, pp. 15-16). The factor analysis identified five factors within the theoretical structure of women athletes' motives: (a) the experience of stress, (b) the maneuvering for accomplishment, (c) the gratification of role interests, (d) the consequences of affiliation, and (e) the satisfaction of adjustment and recognition (Berlin, 1971, p. 14). These findings were the basis for revision and refinement of the model. The hypothetical model, as it currently exists, is represented in Figure 1. The model components are discussed below.



A. Achievement Motivation
Frame-of-Reference

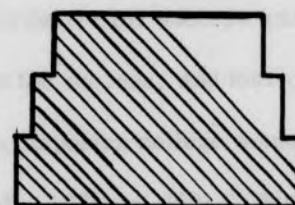


B. Basic Motive Categories



C. Personal Derivatives

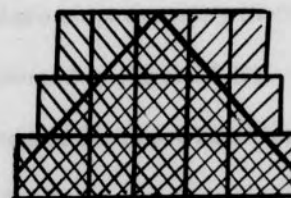
- I The experience of stress
- II The maneuvering for accomplishment
- III Gratification of role interests
- IV Consequences of affiliation
- V Satisfaction of adjustment/
recognition



D. Source of Affect:
Personal--The Individual



E. Source of Affect: Situational--
The Sport Experience



F. Composite Model

(Berlin, 1973, p. 7)

Figure 1

A Model of Collegiate Women's Sport Motivation

As noted above, McClelland's theory of achievement motivation is the broad frame of reference around which the model of women's sport motivation was developed. The model involves several important assumptions about women's sport motivations that are derived from the theory of achievement motivations: "(a) motives to participate in sport are learned and grow out of affective experiences, (b) standards of excellence and competition with these standards are fundamental to sport achievement motives, and (c) desire for success and desire to avoid failure, expectancy of success, incentive for success, and fear of failure as identified by Horner (1970) are all operative in disposing college women to pursue competitive sport experience (Gerber et al., 1974, p. 350)." Berlin's (1972a) finding that the achievement motive is a stable disposition in women collegiate gymnasts further supports the adaptation of achievement motivation to the sport context. Figure 1 (A) represents the broad need for Achievement referant.

The horizontal structures of the model are basic motive categories which Berlin derived from an extensive review of literature on personality theory and sport psychology (Berlin, 1971). They are represented in Figure 1 (B). These three motives, which are considered to be functions of the sport experience are: (a) contribution to self-regard, (b) opportunities for dynamic interaction, and (c) the challenge of mastery (Berlin, 1973, p. 23). The hierarchy of the structure is such that the motive, contribution to self-regard, is the foundational motive upon which the motives, dynamic interactions and mastery, respectively, are imposed. The self-regard motive was derived from personality theories "acknowledging the

primacy of the person as being responsible for her own destiny (Gerber et al., 1974, p. 350)." The top category, challenge for mastery, represents the concept of competence in skill- and performance-related situations. The middle category, opportunities for dynamic interactions, designates the motives which serve a coordinating function between the self-regard and mastery motives (Gerber et al., 1974, pp. 350-351).

The vertical columns of the model, represented in Figure 1 (C), are personal derivatives from sport involvement. These derivatives were identified by means of a factor analysis of the responses of women collegiate athletes to the 80-item Q-sort. The motivating effects of involvement in competitive sport derived from this process are: (a) the experience of stress, (b) maneuvering for accomplishment, (c) the gratification of role interests, (d) the consequences of affiliation, and (e) the satisfaction of adjustment and recognition.

A source of affect designation replaced the descriptive modes and behavioral dispositions of the initial model. This innovation is an attempt to take into account, within the model, the skill-chance dichotomy that exists in sport. Figures 1 (D) and 1 (E) define the overlay of the personal source of affect and the situational source of affect upon the model. Berlin (Gerber et al., 1974) states that this has been a difficult treatment to accommodate into the model. It represents the latest development of the structure to date.

The composite model, with the three basic motive categories, the five personal derivatives, and the two sources of affect, is represented in Figure 1 (F). The structural changes in the model necessitated a revision of the Q-sort.

Statements in the 80-item sort were systematically modified or deleted in an attempt to derive a sort that embodied the components of the restructured model. The revised instrument is a 60-item forced-choice Q-sort; it is structured in such a way that each of the 15 cells contributing to the theoretical structure are represented by four statements in the sort. The 60-item Q-sort and the theory of collegiate women's sport motivations built into the sort are the focus of the present inquiry.

Statement of the Problem

The purpose of this study is to test a tentative theory of the achievement motivation of women collegiate athletes as developed by Berlin (1973). Factor analysis of the responses to a forced-choice, structured Q-sort comprises the research approach. More specifically, the study seeks to answer the following questions:

1. How many factors are identifiable from the Q-statements representing the theory under investigation?
2. What descriptive names can be assigned to these motivational factors?
3. What recommendations are there for further refining the model of women's sport motivations?

Significance of the Study

This research is considered to be significant for several reasons. The newly enjoyed status of the woman athlete to today's sport calls attention to the fact that little is known about the female who engages in competitive sport. This

study seeks to add to the little existing knowledge. A study of women's sport motivation reveals information about the nature of the sport experience as well as facts pertaining to the nature of the female competitor. Physical educators have the responsibility of addressing themselves to such fundamental issues. As women's sport undergoes tremendous change and growth, many physical educators desire to influence the directions taken. Knowledge of the motives of women athletes may contribute to this goal.

Going beyond the mere "Why?" of women's sport participation, this study attempts to formulate a viable model of females' sport motives. The model-building approach is cited by Stodgill (1970) as a process that has great potential for gaining insight and knowledge in the behavioral sciences. Finally, the model-building process and factor analysis used in this study are sophisticated research techniques that attempt to accommodate the complex nature of the motivation construct. Heretofore, there has been no similar inquiry about women's sport motivation.

Definitions

For the purpose of interpretations in this study, the following meanings are ascribed:

1. Achievement Motivation--"The striving to increase, or keep as high as possible, one's own capability in all activities in which a standard of excellence is thought to apply and where the execution of such activities can, therefore, either succeed or fail (Heckhausen, 1967, p. 5)."

2. Q-sort--The procedure of sorting a number of self-reference statements into a series of piles along a continuum of self-description that ranges from "most like me" to "least like me" with varying degrees of approval and disapproval between the extremes.
3. Trait-universe--All of the characteristics of a trait.
4. Woman Collegiate Athlete--A female competitor who participated as a squad member of a bonafide college team that engaged in a full season of scheduled competition under the direction of a designated coach.

Scope of the Study

This study involves the Q-sort responses of 224 women collegiate athletes collected during the 1971-72 and 1972-73 academic years. Twelve college/universities and seven different sports are represented by the women athletes.

Assumptions Underlying the Study

Three assumptions underlie this research. First, the factors underlying an individual's achievement motivation can be measured through the ordering of self-reference statements. Secondly, the self-reference statements of the Q-sort constitute a valid structure of achievement motivation. Thirdly, each individual has a unique sort which can be analyzed precisely and objectively because of the large number of choices represented in the trait-universe of achievement motivation (Kerlinger, 1956, p. 289).

CHAPTER II

REVIEW OF RELATED LITERATURE

This investigation of the motivation of women collegiate athletes draws from several areas of research literature. This review is organized in three major categories: (a) achievement motivation, (b) Q-technique, and (c) women's sport motivation.

Achievement Motivation

Four aspects of achievement motivation are considered in this review: (a) the nature of achievement motivation, (b) the methods of measuring achievement motivation, (c) achievement motivation in women, and (d) achievement motivation and sport.

The Nature of Achievement Motivation

Psychologists observe behavior in order to explain and interpret its causal factor. They are interested in why human beings elect to engage in some activities and not others; why they tend toward one behavior rather than another; why behavior takes certain directions; and what is responsible for the intensity with which it is pursued. Psychologists organize their findings into theoretical explanations; numerous explanations about the motivation of behavior exist. One such theory is the theory of achievement motivation. It applies to a very specific area of human endeavor--activities in which the individual believes

his/her performance will be evaluated in terms of a "standard of excellence" (Atkinson & Feather, 1966, p. 5). Achievement motivation, then, is the tendency to undertake some activity in competition with a standard of excellence. Heckhausen (1967) elaborates on the definition: achievement motivation is the

. . . striving to increase, or keep as high as possible, one's own capability in all activities 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).

The theoretical explanation of achievement motivation is one of a class of motivational theories which attributes the strength of the tendency to act as an interaction of situational and personality variables (Atkinson & Feather, 1966, p. 328). The achievement motive is the personality variable which, when aroused, results in achievement motivation. An understanding of this variable is essential to an understanding of the nature of achievement motivation.

Murray (1938) first identifies the achievement motive, "need for achievement" (nAch), as one of the psychogenic or secondary needs in his conceptualization of human personality as a "hierarchy of needs." The nAch is the need that precipitates behaviors which express desires for accomplishments and prestige, to overcome obstacles, to exercise power, to strive to do something difficult as well and quickly as possible (p. 80).

McClelland (McClelland et al., 1953) rejects the notion that motives are deficit tensional states which energize the organism until equilibrium is restored. He considers some motives as eliciting the organism to positive behaviors, i.e., energizing the individual to approach and maintain pleasure. According to McClelland, the achievement motive is one such motive; it develops from

affective experiences connected with situations involving a standard of excellence. As the individual experiences situations that are judged according to some standards of excellence, he/she begins to develop some feelings and expectancies about this type of situation. If the competition is successful, positive feelings--pride and accomplishment--are developed; if unsuccessful, negative feelings--shame and embarrassment--develop. McClelland (McClelland et al., 1953) believes that all persons possess the motive to some degree because of universal experiences such as learning to walk, talk, read, write, and so forth, from which some intrinsic pleasure develops from mastery of the task (p. 78). However, cultures or families which stress competition with standards, by insisting, for example, that a child be able to perform tasks independently and well, produce individuals with greater achievement motivation (McClelland et al., 1953, p. 275). Thus, the achievement motive, which is perceived as a stable, but latent, characteristic of personality, has its origin in early childhood, and individual differences exist in the strength of this motive (Atkinson & Feather, 1966, p. 12).

Veroff (1969) designates three stages in the development of achievement motivation: (a) autonomous competence, (b) social comparison about achievement, and (c) autonomous motivation integrated with social comparison strivings. Each stage must be mastered before the next stage can be achieved according to Veroff.

Autonomous achievement develops as the young child explores and copes with his/her environment.

A child learning to walk, discovering himself, or merely effectively manipulating objects experiences autonomous achievement pleasures constantly. Autonomous achievement goals generate from these repeated experiences of pleasure in the child's new found capacity to do what he has been previously unable to do (Veroff, 1969, p. 49).

Autonomous achievement motivation involves competition with one's own "internalized" standards.

When the pressure and desire for social comparison exist, the second stage of development evolves. Social comparison conveys information and norms to the individual, thus allowing the learning about self in relation to society. If the individual is reassured about his/her own standards and autonomy, and competence is confirmed by society's standards, the two achievement motivations are integrated. This accommodation of one's own standards with society's standards, where each is used in the appropriate situation, represents the mature stage of achievement motivation (pp. 47-51).

McClelland and Veroff contend that achievement-oriented experiences are vital to the development of achievement motivation. Such experiences provide the individual with information to assess the situational variables involved in the achievement-oriented behaviors: the probability of success and the incentive value of success. From similar experiences in the past, the individual is able to estimate his/her chance of success and place a value on that success in a given situation. Atkinson (Atkinson & Feather, 1966) develops a theory of achievement motivation based on the interaction of these situational and personality variables.

Atkinson's theory assumes the strength of a particular tendency to act is the multiplicative function of motive, probability of a certain outcome, and value

of that outcome to the individual. Thus, the tendency to achieve success is the product of the strength of the achievement motive, the probability of success, and the incentive value of success.

Early achievement motivation theoreticians acknowledge that any potential achievement situation involves the threat of failure as well as the possibility of success. Therefore, two opposing motives are aroused: the motive to achieve success and the motive to avoid failure. The motive to avoid failure is conceived along the same lines as the achievement motive and has the same stable, latent characteristic. Atkinson incorporates this concept into his theory and constructs a formula for the tendency to avoid failure. Analogous to the success tendency, the tendency to avoid failure is represented as a multiplicative function of the motive to avoid failure, the probability of failure, and the incentive value of failure.

Achievement motivation is conceptualized by Atkinson as the result of these two opposing tendencies. In the individual whose motive to achieve success is greater than the motive to avoid failure, the resulting achievement motivation will be positive. He/she will be attracted to potential achievement situations. The individual whose motive to avoid failure is greater than the motive to achieve success will avoid potential achievement situations if possible because of the threat of failure. Atkinson's mathematical model of achievement motivation permits the prediction of an individual's behavior under various achievement conditions, and it has been the source of much research.

Maehr (1973), after reviewing achievement motivation literature, concludes that a fundamental weakness exists in these studies: achievement motivation as defined has a limited cultural context. Inherent in the work of McClelland and his colleagues is the assumption that the Western conceptualization of achievement is normative. Maehr contends that achievement motivation is universal and that it does not exist to different degrees in various cultures. However, he states, that in different cultures it may be elicited by cues and directed to ends different from those operating and accepted in middle-class American culture. He outlines a research strategy that would redirect the theory of achievement motivation and establish a framework for cross-cultural study. Basic to this strategy is the identification of both personality and the situation as critical variables. Maehr urges the study of achievement-related behaviors within the cultures and setting in which they occur. Situational factors to be considered are: (a) social norms and values, (b) locus of control, (c) interpersonal variables, and (d) task dimensions. Future research on achievement motivation, according to Maehr, must "look at person and situation at those times and in those places where achievement motivation--as a more cross-culturally general phenomenon--occurs (p. 25)."

Measurement of Achievement Motivation

One of McClelland's greatest contributions to the study of achievement motivation is the development of a measuring instrument and a systematic scoring procedure. Since McClelland's initial work, many instruments have been designed, but Maehr and Sjogren (1971) refer to the problem of measurement as

very critical to achievement motivation research. In this review, various tests are described. These are classified as projective and objective techniques.

The interrelationships of the measures are also discussed.

Projective Measures. --McClelland accepts the Freudian hypothesis that the most valid and effective assessment of motives is through the analytic treatment of projective fantasies (Atkinson & Feather, 1966; McClelland et al., 1953; Sherwood, 1966). As a measure of the individual difference in the strength of achievement motivation, McClelland adapts the Thematic Apperception Test (TAT), invented by Murray (1938), for eliciting fantasy stories in response to pictures. A set of pictures, usually four to six, chosen to be mildly suggestive of achievement themes is used. After seeing a picture for approximately 20 seconds, the subject is instructed to write a story about the picture, answering the following questions:

1. What is happening? Who are the persons?
2. What has lead up to the 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?

The contents of the stories are analyzed for achievement imagery and scored using an elaborate, but relatively objective, scoring system (McClelland et al., 1953).

The following is an explanation of the process used by McClelland in developing a scoring system for the TAT. Subjects were given a performance task to complete prior to the administration of the TAT. Two motive-arousal conditions were used in introducing the tasks. In the neutral condition,

instructions placed no emphasis on performing well. In the achievement-oriented condition, every attempt was made to arouse the desire to do well on the tasks. Analysis of the stories showed that the stories written under the two arousal conditions differed in a number of characteristics. The characteristics that appeared most frequently under the achievement-arousal condition were regarded as positive indications of heightened achievement motivation. These differences were categorized, and the scoring system of the achievement imagery in fantasy stories evolved.

With this scoring system, stories analyzed as containing achievement goals by involving competition with a standard of excellence, a unique accomplishment, or long-term involvement are further scored by achievement imagery. An overall nAchievement score is obtained for a subject by algebraically summing the achievement imagery evidenced in the subject's stories. McClelland (McClelland et al., 1953) explains the relationship between the nAch scores and achievement motivation:

Thus individual differences in frequency of imaginative responses aroused by pictures themselves is a justifiable basis for inferring that subjects would be differentially motivated when actually in real-life situations to those portrayed (p. 88).

The correlations between TAT nAchievement scores and a number of achievement behavior indices, i.e., output on performance tests, rate of learning, grades, and so forth, suggest the validity of the score as a measure of achievement motivation (Birney, 1968; Clark & McClelland, 1956; deCharms, Morrison, Reitman, & McClelland, 1955; McClelland et al., 1953). However, this is only true for males. McClelland (McClelland et al., 1953) finds no

evidence of the validity of the scoring system for females (p. 173). High inter-scorer and rescorer reliabilities are reported consistently (Birney, 1968; Himelstein & Kimbrough, 1960; Klinger, 1966; McClelland et al., 1953), but test-retest reliabilities are low or nonsignificant (Birney, 1959, 1968; Kagan & Moss, 1959; Klinger, 1966; Krumboltz & Farquhar, 1957). Despite these findings of instability and inconsistent validity, the TAT is the most frequently used measure of achievement motivation for men and women.

French (1955) reports the development of a "Test of Insight" as a measure of achievement motivation. The test consists of single sentence items describing various behaviors of a fictitious individual. A subject writes a story explaining the behavior, and the story is analyzed for achievement-imagery. An adaptation of McClelland's achievement imagery scoring system is used to derive an achievement motivation score. The assumption underlying the instrument is that an individual with high achievement motivation will project this motivation into his/her explanation of the behavior that is presented. Male and female forms are constructed by using either male or female characters in the items.

Objective Measures. --The most commonly used objective measure of the need for achievement is the achievement scale in the Edwards Personal Preference Schedule (EPPS). The EPPS is a forced-choice, standardized inventory which furnishes scores for 15 personality variables: achievement, autonomy, deference, dominance, endurance, succorance, change, nurturance, order, abasement, exhibition, affiliation, intraception, heterosexuality, and aggression.

The achievement scale consists of 28 items in which achievement statements are paired against statements specific to other variables. The subject is asked to choose the statement from each pair that is more descriptive of him/her. The number of times the subject selects the achievement statement represents his/her achievement motivation score. Test-retest reliability for the EPPS achievement scale is only modest, and no validity is suggested other than the face validity of the items (Edwards, 1970, pp. 60-61).

Testing the assumption that projective measures are more valid measures of achievement motivation than objective measures, deCharms, Morrison, Reitman, and McClelland (1955) compare achievement scores obtained from a questionnaire measure with those obtained from the TAT. It is McClelland's contention that achievement motive can be verbalized only imperfectly; therefore, a direct measure does not assess the same need for achievement as a projective measure. Subsequently, the questionnaire score is labeled vAchievement to differentiate it from nAchievement. Subjects respond to items on the questionnaire, including nine achievement items, by indicating on a graphic scale the extent of their agreement with the statement. The vAchievement score is the sum of the subject's responses to the nine items. There is a low, barely significant, correlation between the two measures. The investigators report also that the two measures relate differently to such behavior patterns as conformity, effect of authority, and performance tasks. Sherwood (1966) later finds a nonsignificant difference between the measures as predictors of achievement-oriented behavior and higher correlation between the measures than

reported by deCharms and others.

Hurley (1955) introduces the Iowa Picture Interpretation Test (IPIT) as an objective measure of achievement motivation which integrates the "depth" of projective techniques with the advantages of objective techniques (p. 372). Ten TAT pictures are selected, and a set of four multiple-choice responses formulated for each picture. One story in each set represents one of the following personality variables: achievement imagery, blandness, insecurity, and hostility. In the test administration, a picture is exposed for 50 seconds. The subject then ranks the alternative choices, one to four, according to personal preference. Achievement imagery scores are obtained by summing the ranks assigned to the ten achievement stories. Test-retest coefficients of reliability are low, particularly for an objective test. Validity is suggested by the relationships among the personality variables included in the test that are consistent with psychological theory.

Johnston (1957) attempts to improve the predictive capability and reliability of the IPIT with the development of alternative forms. In one form, designated Form RK, 14 pictures are added to the original IPIT, and the same ranking procedure is used. The second form, Form RT, uses the same 24 pictures, but subjects rate the four choices on a scale with regard to how well the stories describe the action in the picture. Achievement motivation scores are obtained by summing the rankings of the achievement imagery statements on Form RK and the ratings on Form RT. Reliability is higher for both the alternative forms than the original, but not significantly higher. Johnston finds the

scores on the RK scale are better predictors of performance than either scores on the RT scale or the original. He concludes that Form RK is a more useful measure of achievement motivation in terms of predictive capability and reliability than the other two measures tested.

Holmes' and Tyler's (1968) study involves the use of two direct measures of achievement motivation. A "self-rating" score is obtained by having the subject rate himself/herself on a 16-point achievement motivation scale. A "self-peer ranking" results from the subject rating himself/herself as having a higher or lower need to achieve than ten peers selected as individuals well-known to the subject. The self-peer rank score is the number of individuals rated lower in achievement motivation than the subject. There is no relationship between the scores obtained on the direct measures and scores on the TAT. However, the self-peer rating is the one measure significantly correlated to the criterion measure of "long-term" achievement. In contrast to deCharms and others (1953), Holmes and Tyler report that subjects are able to directly express their achievement motivation, and these self-reports are significantly more accurate in predicting long-term achievement than a projective measure.

Costello (1967) factor analyzes the yes-no questionnaire responses of men and women of different ages and occupations in his study of achievement motivation. The items he developed are based on achievement items in the EPPS. The factors of achievement motivation are identified, and Costello labels them the "need to do well when performing a task" and the "need to be a success." A scale to measure each factor is derived from the analysis. Each scale is

comprised of the items with the highest loadings on the factor measured plus lowest loadings on the other factor. Scale I, measuring the need to do well, consists of ten items. Scale II, measuring the need to be a success, is comprised of 14 items. Costello reports adequate reliability for both scales. However, further validity studies are necessary to determine the nature of the traits being measured.

Mehrabian (1969) utilizes separate male and female questionnaires consisting of verbal items designed to discriminate individuals high in achievement motivation from those low in achievement motivation. Subjects respond to the items on a seven point scale, indicating the degree of their agreement with the statements. The scales demonstrate reasonable reliability, however correlations between the scales and the TAT are not significant. Mehrabian concludes that the relationship between the questionnaire scores and performance, consistent with findings in other studies of achievement motivation, supports the validity of the questionnaire measures.

Lynn (1969) derives a questionnaire measure of achievement motivation by factor analysis. A single factor, appearing to be achievement motivation, emerges from the analysis of the responses of subjects to 63 items designed to reflect characteristics of achievement motivation. The eight questions with highest loadings on the factor comprise the questionnaire. A score is obtained by adding the number of yes responses on questions that reflect achievement motivation to the number of no responses on those questions that do not. The scale is primarily designed for use with persons in executive, managerial, and

professional occupations. The high scores which resulted from the administration of the scale to groups of successful people is consistent with achievement motivation theory, thus supporting the validity of Lynn's questionnaire.

Plummer (1969) measures the achievement motivation of selected groups of athletes by means of a forced-choice Q-sort. Sixty items, each having a predetermined quantitative value of achievement content, are placed along a self-description continuum ranging from "most like me" to "least like me." The quantitative values of the nine items assigned to the extreme "most like me" positions are summed, as are the values of the nine items selected for the extreme "least like me" positions. The achievement motivation score is computed by subtracting the "least like me" score from the "most like me" score. No evidence of reliability is reported for this instrument.

Hermans (1970) constructs a questionnaire of multiple-choice items to measure achievement motivation. Descriptions of the achievement-motivated individual are used in writing the items that constitute the item-pool. These descriptions are based on ten aspects of achievement motivation that are identified in the literature. An item-cluster analysis yields a 29-item questionnaire that embodies all but one aspect. No correlation exists between scores on the questionnaire and TAT scores. The objective scores are related to performance on an achievement-oriented task while scores on the TAT are not. Hermans concludes that the questionnaire has sufficient substantive validity, internal consistency, and discriminant validity to be used as a measure of achievement motivation.

Interrelationships of the Measures

The lack of reliability and the difficulty of administration and scoring of the TAT are cited as two reasons for the desirability of an objective measure of this personality variable (Maehr & Sjogren, 1971, p. 148). The existence of several objective measures that can be substituted for projective measures has been substantiated in this review, but the reported relationships between these measures are not impressive.

Several studies report no significant relationships between TAT scores and scores on the EPPS Achievement Scale (Bendig, 1957; Himelstein, Eschenbach, & Carp, 1958; Marlowe, 1959; Melikian, 1958; Shaw, 1961). One study yields no relationship between the French Test of Insight and the EPPS (Himelstein et al., 1958); while another study reports a significant relationship between the two for males (Shaw, 1961). Hermans (1970) and Melikian (1958) find no relationship between questionnaire scores and TAT scores. A small correlation between a questionnaire measure and the TAT is reported by deCharms and others (1958) and Sherwood (1966). A self-ranking measure developed by Holmes and Tyler (1968) has no relationship to the TAT.

Interpretations of the lack of relationship between objective measures and projective measures are as varied as the instruments. One suggestion is that different expectancies are aroused in different situations. In the fantasy situation, the cues may lead the subject to expect satisfaction for creative and imaginative behavior. The self-report situation may lead to the expectancy of satisfaction for being self-revealing (Marlowe, 1959). Melikian (1958) postulates

that the objective measures and projective measures "tap" different levels of achievement motivation--a "manifest" level and a "latent" level, respectively. The hypothesis that the tests could be measuring different types of achievement motivation is suggested by Bendig (1959), while Himelstein and others (1958) discuss the possibility that the instruments could measure traits that have no relationship except a common name assigned to them.

After reviewing the relationship between projective and objective measures, McClelland (McClelland et al., 1953) concludes that the evidence "points to low or insignificant relationships between fantasy measures of motivation and measures based on choice or self-description (p. 25)." His assumption is that the projective measure is the valid and reliable one. However, a significant correlation between projective measures, the TAT and Test of Insight, does not exist (Himelstein et al., 1958). Klinger (1966) and Maehr and Sjogren (1971) also take exception to McClelland's assumption.

Maehr and Sjogren (1971) question the appropriateness of designing objective instruments on an a priori or theoretical basis and then determining the validity by correlation with projective measures and behaviors designated as achievement-oriented. They suggest:

. . . a more appropriate tactic might be to build a scale empirically by selecting items that differentiate between people who perform a task with high achievement motivation and those who perform with low achievement motivation (p. 149).

Some of the more recent measures such as Mehrabian's (1968), Lynn's (1969), and Herman's (1970) show promise along these lines.

Achievement Motivation of Women

One of the problems that appears early and consistently in the literature about achievement motivation is the question of sex differences. An impressive body of research shows that achievement motivation scores of men increase under experimental conditions which stress intelligence and leadership ability and that there is a relationship between these scores and achievement-related behavior (Atkinson & Feather, 1966; Lesser, 1973; Lesser, Krawitz, & Packard, 1963). The few studies reporting achievement motivation for women are not consistent with these findings for men, nor are they internally consistent (Horner, 1973; Klinger, 1966; Lesser, 1973). Some studies attempt to explain the sex difference that apparently exists in achievement motivation.

One of the earliest inquiries is Field's investigation of the achievement motivation of college women that is cited by McClelland in The Achievement Motive. The achievement scores obtained from TAT protocols did not increase under experimental arousal conditions created by reference to intelligence and leadership. Scores did increase, however, under conditions that aroused concern about social acceptance. These results support the hypothesis that achievement motivation in women is related to social acceptability.

Veroff, Wilcox, and Atkinson (1953), in testing high school and college females, introduce another variable by the use of TAT pictures in which women are central figures. In both groups, nAch scores are significantly lower for stories written in response to pictures with women characters than pictures with men. The relationship between achievement motivation scores and performance

on an anagram task is virtually the same as that reported for men. Thus, the hypothesis that the TAT is a valid measure of achievement motivation of women is supported. An explanation offered for the fact that women express achievement motivation predominantly in stories about the opposite sex is the cultural definitions of male and female roles. This conclusion is based on the investigators' assumption that striving for and attaining success is not the accepted role of the female in society.

DeCharms and others (1955) report that the TAT achievement scores of college women derived from pictures of career women are not related to performance. They conclude that the picture cues must be of men or women in non-achievement situations if the scores are to be valid predictors of performance.

Lesser, Krawitz, and Packard (1963) test the notion that the failure to increase achievement motivation in women by achievement-oriented cues is due to a lack of concern by subjects for intellectual standards and achievement through intellectual ability. Subjects are selected from a school for the intellectually gifted; it is assumed that they have an intellectual orientation. The hypothesis that experimental conditions stressing intelligence will produce an increase in TAT scores is not supported. The higher scores produced from pictures depicting males than those depicting females is consistent with the findings of other studies. However, a group classified as "achievers" on the basis of grades score higher on pictures of females than pictures of males. The result is interpreted as showing that achieving girls perceive intellectual achievement as a relevant part of the female role. The underachievers perceive

intellectual achievement as more relevant to the male role than the female role.

French and Lesser (1964) investigate the effect of women's value orientation on achievement motivation. Two propositions are tested: (a) motivation scores increase only when arousal goals are related to a valued goal, and (b) a positive motivation-performance relationship exists only when the arousal cues are related to valued goals. Three groups of college women with different value orientations are tested with male and female forms of the French Test of Insight: (a) those who value intellectual attainment, (b) those who value women's role attainment, and (c) those who value both. Intellectual arousal and women's role arousal comprise the experimental conditions for the testing. Both hypotheses are strongly confirmed. The data also show that regardless of value orientation, higher scores are obtained when subjects respond to male figures under intellectual arousal and female figures under women's role arousal. The study is significant in that it encompasses the conflict between intellectual goals and women's role goals that exists as the female role is being redefined in society.

Burton (1971) investigates the interaction of selected personality variables and skill attainment in college women enrolled in either beginning riflery or bowling classes. Costello's (1967) scales are used to measure two dispositions of achievement motivation: (a) the need to succeed through one's own efforts, and (b) the need to succeed through the emulation of the successful rather than hard work. Anxiety scores on the State-Trait Anxiety Inventory are also obtained. Analysis of the data shows no relationship between the two dispositions of achievement motivation. No relationship exists between the two needs to succeed and the

actual skill attained, except for a significant inverse correlation between the need to achieve through one's own efforts and bowling skill. The relationships between the achievement motivation and anxiety variables suggest that individuals high in anxiety tend to seek success through the emulation of the successful rather than through hard work. Inasmuch as the ideas generated by Burton's work have not been further tested, the value of the research appears to be more heuristic than informative.

Horner (1973) proposes the existence of a "motive to avoid success" that is a stable disposition of an individual's personality. This motive, according to Horner, is acquired early in life in conjunction with sex standards. The motive can be viewed in two ways: (a) the predisposition to feel anxious when successful because of the conflict between behavior and sex role standards, and (b) the predisposition to feel anxious about social rejection following successful competitive experiences. When aroused, this motive results in a motivational tendency to avoid success which inhibits the desire to do well. Consequently, performance is adversely affected by the arousal of this motive.

Horner devises a projective instrument to measure the motive to avoid success. Undergraduate students write stories based on the following cue, with women writing about "Anne," and the men writing about "John": "After first-term finals, Anne/John finds herself/himself at the top of her/his medical school class (p. 225)." Analysis of the success-avoidance imagery in the stories confirms the hypothesis that the motive to avoid success is more characteristic of women than men. Further, Horner cites three important trends suggested by

the data: (a) women, especially those high in the motive to avoid success, will explore their intellectual potential to the fullest only when in noncompetitive situations and least of all when competing against men, (b) the motive to avoid success is more salient for the highly capable, highly achievement motivated, successfully competitive women than her counterpart, and (c) women high in the motive to avoid success probably inhibit expression of achievement motivation on the TAT (p. 229). Horner concludes that the motive to avoid success exists as a psychological barrier to women's intellectual and professional achievement in our society.

Recently Lockheed-Katz (1974) has attempted to gain further understanding of Horner's motive to avoid success. According to Lockheed-Katz, the phenomenon is a social, not a psychological one. She contends that in Horner's study the subjects respond negatively to "Anne's" deviant behavior, not her success. The hypothesis that the social appropriateness of behavior determines the response to subsequent success is tested in her study. Specifically, if a female's behavior is perceived as socially acceptable, reaction to her success is favorable; if her behavior is viewed as deviant, reaction to success will be unfavorable. To test the hypothesis, Lockheed-Katz modifies Horner's story cue with statements that define the social appropriateness of "Anne's" behavior: (a) "All Anne's classmates in medical school are men," and (b) "Half of Anne's classmates in medical school are women (p. 7)." Stories written by men and women undergraduates about "Anne" are analyzed for success-avoidant imagery. As predicted, significantly more respondents express a motive to avoid success when Anne is the

only woman in medical school than when she has female classmates. The men respond negatively to success as a result of deviant behavior and favorably when the behavior is socially acceptable. However, there is no significant difference between female's use of success-avoidant imagery when responding to the two different cues. Lockheed-Katz concludes that the attitudes of women toward successful women are more favorable than that of men. She suggests that achieving women in the past may have expressed a motive to avoid success because of the hostile reactions of men to such achievement. Further, she contends that present day women do not reveal such a motive because of the new definitions of social behavior for women. This study concurs with others that relate the achievement motivation of women to social roles, but it is important to note that it is the first study to assess the effect changing social patterns have had on the achievement motivation of women.

Achievement Motivation and Sport

The very nature of achievement motivation suggests some type of relationship with sport. Atkinson and Feather (1966), defining the realm of behavior to which achievement motivation applies, say:

The theory of achievement motivation is a miniature system applied to a specific context, the domain of achievement-oriented activities, which is characterized by the fact that the individual is responsible for the outcome (success or failure), he anticipates unambiguous knowledge of results, and there is some degree of uncertainty or risk (p. 5).

In sport the competitor enters a game knowing that he/she, individually or as a member of the team, will be responsible for the outcome of the game. The final

score of a game leaves no doubt as to the outcome; it is a most unambiguous knowledge of results. No athlete participates in a game without the knowledge that there is a risk of losing involved as well as the possibility of winning. Sport, then, contains the elements of an achievement-oriented situation as described by Atkinson and Feather. It logically follows, then, that achievement motivation may be regarded as a relevant construct in the psychological make-up of those who engage in sport.

McClelland (1961) gives some subjective support to this hypothesis in his book, The Achieving Society. Searching for a mythological personality that is characterized by high achievement motivation, McClelland selects the Greek god, Hermes. One of Hermes' roles is that of the athlete, and he is the patron of gymnasia and athletic contests. McClelland postulates on the relationship between sport and achievement motivation:

If he (Hermes) is the embodiment of the spirit of high nAchievement and entrepreneurship, as we have argued, then we might expect those with high nAch to be more interested in competitive athletics both as spectators and participants. This association is not unreasonable: by definition people with a high level of nAch show more 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 where they will have a chance to achieve (or watch others achieve) standards of excellence (p. 322)?

McClelland's finding of cases where levels of high achievement motivation appeared historically with increased interest in competitive sport, for example, classical Greece and the Olympics, hint strongly at a relationship between the two. However, he cites two studies in which the statistical analyses yield conflicting results. In the first study, an attempt is made to measure a

nation's interest in competitive sport and to compare that to nAchievement measures for the nation. The team scores for the Summer Olympic Games in 1928, 1932, 1952, and 1956 are used as an index of the extent to which the people in a country are interested in athletics. No significant relationship exists between the nAch scores and the points won in Olympic competition (McClelland, 1961, p. 323). However, it should be noted that the authority on the subject, McClelland, raises several objections to the assumptions made and measures used in the study. The results, then, are considered by some to be tenuous.

In the second study, the investigator classifies the games played by selective preliterate tribes as competitive or noncompetitive, group or individual. The game ratings are compared to folk tale measures of nAchievement. Results show that significantly more of the tribes high in achievement motivation play more individualistic, competitive games as contrasted with group, noncompetitive games. The reverse is true for tribes low in achievement motivation. The study supports the hypothesis that it is the competitive nature of games which is characteristic of cultures high in achievement motivation (McClelland, 1961, pp. 323-324).

Vanek and Hosek (1970), sport psychologists, postulate that the need for achievement is a basic drive in sport motivation which they conceptualize as a "drive motivation cluster." In order to investigate the role of nAchievement in sport motivation, the researchers modify the TAT in two ways: (a) a set of pictures with high affinity to the sport situation is used, and (b) the scoring system is modified. Correlations of the measures of need for achievement in

sportsmen with behaviorial variables yield what Vanek and Hosek term "promising" results (p. 90). This research does not report sufficient specific or statistical information, but it seems important that the investigators recognize the appropriateness of achievement motivation to the study of sport motivation.

Gorsuch (1968) tests the hypothesis that athletes have higher achievement motivation than nonathletes. His study investigates the achievement motive as a component in the psychological make-up of athletes and may be interpreted as a test of the construct validity of the TAT. Subjects are a group of male collegiate varsity athletes, representing ten sports, and a group of nonathletes. Achievement motivation scores are obtained using the TAT and a modified version of the test which includes two additional pictures with athletic themes. Test protocols are scored by psychometricians. Analysis of the achievement scores reveal no significant differences between athletes and nonathletes, between team and individual sport participants, or between the ten sport subcategories. Comparisons of nAch scores with published means and ranges for general college males show both the athletes and nonathletes to be significantly lower in achievement motivation. On the basis of these results, the hypothesis is rejected, and Gorsuch questions the validity of the TAT as a measure of achievement motivation.

Willis (1968) explores the relationship between the theory of achievement motivation and competitive spirit in collegiate varsity wrestlers. He predicts that achievement motivation will affect performance and be reflected in the athlete's won-loss record. It is also hypothesized that achievement motivation is an index of competitive spirit. Scores of the TAT and the Maudsley Personality

Inventory (MPI) are obtained and represent the motive to succeed and the motive to avoid failure. A resultant motivation score is computed by subtracting the score on the MPI from the TAT score. Self-ratings and ratings by peers and coaches are used to assess competitive spirit. Successful performance is measured on the basis of the athlete's won-loss record in dual meets. Results show that the achievement motivation score does not reliably predict success in wrestling, but there is a tendency for high success scores to be related to higher achievement scores on the TAT. There is a modest relationship between achievement motivation and competitive spirit, but the nAch score cannot be considered a valid measure of competitive spirit. Although the study gives minimal support to the existence of a relationship between achievement motivation and successful performance in wrestling--in accordance with Atkinson's theory of motivation--several inadequacies of the theory in the sport situation are suggested.

Plummer (1969) studies the achievement motivation of two groups of collegiate varsity athletes representing a team sport and an individual sport. The investigator devises a measure of achievement motivation based on Q-methodology. A Q-sort is administered to male gymnasts and baseball players. It is hypothesized that gymnasts have higher achievement motivation scores than baseball players and that there is a difference in the way in which the two groups value the items in the sort. Both hypotheses are rejected.

The purposes of Yeary's (1971) study are: (a) to investigate the achievement motivation of women athletes in selected sports, and (b) to assess the

difference in performance of two groups of women athletes differing in underlying motivational dispositions. In the first phase of the study women collegiate athletes, representing five sports--basketball, field hockey, gymnastics, swimming, and tennis--serve as subjects. Four psychological tests are administered: (a) Mehrabian's Achievement Scale for Females (ASF), (b) Achievement Anxiety Scale (AAS), (c) Maudsley Personality Inventory (MPI), and (d) Taylor's Manifest Anxiety Scale (MAS). In the second phase, a subgroup of athletes are classified as high achievers or low achievers on the basis of ASF and MAS scores. Members of the subgroup are also categorized according to arm strength and performance on an isometric holding task. Persistence, on the latter physical task, is intended to represent one aspect of achievement motivation. Results yield no significant difference in achievement motivation among the sport groups. No significantly different performance between high and low achievers is observed on the isometric endurance test. However, the low strength group performs significantly better than the high strength group. The ASF demonstrates erratic and unexpected correlations with other criterion measures. Failure of the ASF to demonstrate consistent results with reports of measurement effectiveness in the literature partially explains the failure to verify the hypothesized differences. Although the study yields confusing results, it is important because it demonstrates the lack of validity of the Mehrabian scale and leaves room for still other instrumentation. Furthermore, it involves women athletes, thus contributing to a very limited amount of data about female sport competitors.

Q-Technique

This review is organized in two major categories: (a) basic consideration of Q-technique, and (b) a review of studies in physical education utilizing Q-technique.

Basic Considerations

Q-technique is a sophisticated ranking method included in a set of psychometric and statistical procedures developed by Stephenson (1953) and designated Q-methodology. Characteristically, the Q-technique requires the subject to sort a number of self-reference statements into a specified number of subsets along a continuum of self-description ranging from "most like me" to "least like me." The analysis most commonly used in Q-studies is the correlation of the Q-sort responses of different persons or the sorts of the same individual sorted under different conditions. More complex correlational techniques or analysis of variance can be applied to the data obtained from Q-sorts. The Q-sort has been used primarily in two types of research: (a) the study of verbalized attitudes, self-descriptions, preferences, and other variables in social and clinical psychology, and (b) the testing of behavioral or social theories. A different type of Q-sort is required for each of the two research purposes.

A particular sort is designated as "unstructured" or "structured" depending on the method used to compile the set of statements in the sort. In an unstructured sort, a large number of statements, presumably measuring a certain broad variable, are collected from various sources--personality tests, research literature, clinical files--or they are constructed by the investigator

(Kerlinger, 1964; Nunnally, 1967). The attempt is made to have a "random" sample, not in the usual sense of the word, but in terms of the statements' representativeness of the theoretically infinite population of the phenomenon under investigation (Kerlinger, 1964, p. 586). Unstructured Q-sorts are used extensively in personality research and clinical psychology. Typical sort instructions direct the individual to arrange the statements according to a self-perception criterion and the perception of an ideal self. Inferences about the individual's personality and/or adjustment are drawn from the discrepancies between the two sorts (Wittenborn, 1961).

Theoretical propositions, therefore, not the individual doing the sorting, are tested by means of a structured sort. The structured sample is one in which statements are selected or constructed for inclusion according to some experimental design, i.e., the theory is "built" into the sort (Nunnally, 1967). Subjects are selected who, the investigator feels, possess the values or motives represented in the theory. Analysis of the sort responses results in a statistical demonstration of the validity of the theory if two conditions exist: (a) the theory is valid, and (b) the Q-statements adequately represent the theory (Kerlinger, 1964, p. 588). Wittenborn (1961) surveys Q-studies and reports that few employ the Q-technique for testing theories, but Kerlinger (1964) asserts that the role of the Q-sort in this research strategy is one of the most important contributions of Stephenson's Q-methodology.

Q-technique is termed a "flexible and useful tool in the armamentarium of the psychological and educational investigator (Kerlinger, 1964, p. 592)."

However, several strictures are made of the procedure. The most significant of these is the question of the appropriateness of the forced sort. In a forced sort, the subject is required to distribute items in a predetermined, fixed distribution; a specified number of statements must be placed in each subset. Two criticisms are leveled at the forced sort procedure: (a) it requires subjects to conform to an unnatural and unreasonable demand, and (b) important statistical information, such as means and standard deviations, is lost when individual differences in the shape of the distribution is suppressed (Cronbach, 1953, p. 379).

Several studies investigate the soundness of the forced distribution requirement. Livson and Nichols (1956) report that the forced sort yields more reliable information than the unforced sort--one in which the distribution is not specified, but left to the individual. They conclude that in most studies the forced sort should be used. Block (1956) maintains that the item sorting under the forced distribution condition appears to be more stable and discriminating than item sorting under the unforced sort condition. He concurs with Livson and Nichols on the preferability of the forced sort. Jones (1956), on the other hand, finds significant differences between subjects' unforced sort distributions and the normal distribution imposed in Q. He concludes that the forced distribution results in a significant loss of information which could be prevented with the use of the unforced sort.

Kerlinger (1964) argues in favor of the forced sort. The fact that an individual may feel constrained in the sorting process, according to Kerlinger, is not a sufficient reason to invalidate the method. He contends that all

psychometric procedures are constraints on the subjects in that they force individuals to make discriminations which they might otherwise not make (p. 595). He cites the loss of elevation and scatter information as a more serious criticism, but cautions against discarding the method because of this apparent shortcoming. He asserts that the loss of important information can be avoided if the Q-technique is employed only in appropriate experimental situations. According to Kerlinger, the Q-sort is a useful tool in situations where relationships among variables within individuals or groups, and not individual differences, are of concern.

Nunnally (1967) and Kerlinger (1964) favor the use of the forced sort, and more specifically, an approximately normal distribution. Nunnally justifies the use of this particular distribution with the following reasons: (a) many things in nature are distributed this way, and (b) the distribution fits in well with statistical assumptions and methods (p. 547).

Recently, Brown (1971) reconsiders the issue of the forced-free distributions. He concludes that the statistical information is contained in the item ordering and that essentially the same results are obtained despite the distribution used.

Another major criticism of the sort procedure is Edward's (1955, 1957) contention that the Q-sort is susceptible to the influence of social desirability. Citing evidence which shows that social desirability is an important variable in self-description personality tests, he hypothesizes that it is also an influential variable in Q-sorting. According to this assumption, subjects will tend to

regard those items with high social desirability as most descriptive of themselves and those items with low social desirability as least descriptive of themselves. Edwards (1955) tests this hypothesis by administering a Q-sort composed of personality items to a group of college students. The high correlation between the social desirability scale values of the items and the sort ratings assigned to them confirms the hypothesis.

Edwards and Horst (1953) summarize the influence social desirability has, statistically, on Q-sorts: the tendency for subjects to describe themselves in terms of socially desirable characteristics generally results in higher inter-correlations between subjects than actually exist (p. 622). Edwards (1957) suggests two methods to control the social desirability variable in Q-sorts: (a) include in the sort only statements that have the same social desirability scale values, or (b) construct a sort in which the social desirability values are balanced with respect to the variable under consideration (p. 80). Thus, minimizing the influence of social desirability or "accommodating it" as described above, results in more meaningful and clearer findings.

Studies in Physical Education Utilizing Q-Technique

A number of studies in physical education use the Q-technique as it is commonly used in psychological testing: the subject sorts the statements in a self-sort and an ideal-sort and the differences between the two are investigated. Doudlah (1962) uses a Q-sort procedure to investigate the relationship between motor performance, self-concept, body-image, and movement-concept of college

women. She constructs a 75-item sort for each of the psychological variables and obtains a self-sort and ideal-sort on the three instruments for each subject. The correlation coefficient between a subject's ideal- and self-sort on a particular Q-sort is the subject's score for the variable being measured by the sort. The scores on the three psychological variables are compared to performance on a selected motor ability test.

Nation (1963) applies Doudlah's movement-concept sort to a group of college women in an attempt to determine the effect of instruction in body mechanics, fencing, and bowling on movement-concept. Nelson (1966) adapts the statements in Doudlah's self-concept sort for use with adolescent girls and studies the relationship between the self-concept and motor ability of eighth grade girls. Richardson (1967), interested in the difference between movement education approach to teaching and a traditional approach, uses the Q-technique to study the effect these methods have on the movement concept of college women enrolled in gymnastics classes. Sakers (1968) investigates the relationships between motor performance, self-concept, movement-concept, and body-concept of adolescent girls by means of Q-sorts. Evans (1971) uses a Q-sort to study the changes in self-concept of women collegiate basketball players after a season of competition.

Plummer (1969) uses the Q-technique in an interesting and creative manner to measure the achievement motivation of male collegiate gymnasts and basketball players. He constructs a 60-item achievement Q-sort which is administered only once to the subject. Each statement in the sort has a

quantitative value of achievement motivation that is derived from judges' ratings of the statements. A system is devised to compute an achievement motivation score for the subject based on his sort and the achievement motivation values of the statements. Plummer's specific use of Q, i.e., a one-sort experience to generate "nAch" data is closely related to the technique used in the present study.

Webber (1970), concerned with the Q-sort procedure itself, administers Plummer's sort to collegiate varsity crew and lacrosse athletes. Subjects sort the statements under two conditions: (a) in a "self-likeness" context, and (b) in a "social desirability" context. Comparisons of the mean scores for each statement in the two sorts verify Webber's hypothesis that the social desirability variable influences responses on the achievement motivation Q-sort.

Heinhold (1972) explores the motives of female sport spectators using the Q-technique. A sort of 72 items is constructed from the self-reported motives for sport spectator participation of a group of randomly selected persons. The sort is administered to female and male college students, the responses between subjects correlated, and the resulting matrix factor analyzed. The following female spectator types are identified: (a) skill lovers, (b) competition seekers, (c) social onlookers, (d) non-interpretable, (e) self-improver, (f) passive relaxer, (g) thrill seeker, and (h) identifiers. Males were categorized as the following types: (a) skill onlookers, (b) self-stimulators, (c) friendly eclectics, (d) skill analyzers, (e) easy goers, (f) identity seekers, (g) punitive indulgers, and (h) self-improvers. Comparisons of the two typologies show some sex differences, but in general the relationships among the types are relatively

strong. Although women ranked social involvement higher than men, skill appreciation and thrill seeking are much more important reasons for participation, suggesting an active role of involvement for women sport spectators. Skill is a paramount factor throughout the study. Heinhold concludes that the study affirms the existence of sport spectator types that are probably parallel to personality types.

Berlin (1971, 1972b, 1973) borrows a sorting procedure from Stephenson's Q-methodology to study the sport motivation of collegiate women. The following summarizes the process she uses in her research. Berlin formulated a hypothetical structure of the motives of collegiate women athletes and built the theory into a set of Q-statements. The original sort and a revised form have been administered to approximately 1000 college women (Gerber et al., 1974). The hypothetical model has been modified based on the sort responses of these women, and it is still in an evolutionary process. Berlin's studies represent a first effort in physical education to validate theory through utilization of the Q-technique. The present investigation grows from these attempts to delineate a structure of female athletic motivation.

Women's Sport Motivation

The literature of sport motivation offers only a few reports of specific investigation about the motivation of women athletes. These studies are classified in two major categories: (a) those that deal with survey data, and (b) those that propose general theoretical explanations.

Survey-Derived Explanations

Hueser (1965) investigates the sport motivation of German high school girls. In the study each subject writes an anonymous essay giving the reasons she likes to participate in sport and the reasons she dislikes physical activity. Analysis of the essays reveals an overwhelmingly favorable attitude toward participation in physical activity. Hueser summarizes the reasons for favoring participation in sport:

1. The simple joy of physical movement.
2. A special enjoyment of a particular type of favored sport.
3. Productive effort, combined with the satisfaction of competition.
4. Delight of exercising in the open air, including the pleasure of nature.
5. Contact possibilities with sport-minded people.
6. Health benefits of physical exercise and recreation.
7. The reduction of body weight and the objective to reach good poise and posture (Gerber et al., 1974, p. 337).

Despite a generally positive attitude toward sport participation, some reasons that would discourage involvement are presented. These include: (a) lack of time, (b) distance from and/or unattractiveness of facilities, (c) expense involved, (d) lack of qualified instructors, (e) reluctance to accept club obligations, and (f) limited sport programs in schools. Hueser's study is important in that it is one of the early investigations in the area of women's motivation, it uses an interesting data-gathering technique, and it provides comparative data for American women (Gerber et al., 1974, p. 336-337).

Petrie (1970) includes both men and women undergraduate students in his study of the motivations for participation in physical activity. Given a list of possible motives for participating in sport, women rank social interaction, fun,

and aesthetic expression highest. Males select the pursuit of risk, demonstration of skill with a weapon, competition on the basis of skill, competition on the basis of combat, and competition against the natural environment as their reasons for participation in physical activity. There are no differences between males' and females' responses to statements representing participation for health and fitness and for involvement against chance (Gerber et al., 1974, p. 340).

Kaatz (1973) administers a checklist of reasons for participating on athletic teams to both men and women collegiate tennis and lacrosse players. The most frequently selected motives for women are fun, skill improvement, and competitive experience. The most important reasons to men are fun, competitive experience, and excitement. One notable sex difference found by Kaatz is that excitement derived from athletic participation is the least important reason of those listed to women. Yet, there is a noticeable similarity between the responses of men and women as contrasted to Petrie's findings. Two facts might explain the contradictory findings: (a) Petrie's list of motivational statements is more extensive and specific than Kaatz's, and (b) the former study involves general college students while the latter involves varsity athletes.

Poindexter and Mushier (1973), considering the evergrowing demand for competitive sport experiences for women, ask a group of young women why they participate in competitive athletics. They summarize their findings as follows:

1. Enjoyment of activity or a specific activity.
2. Social opportunity and comradeship with friends.
3. Personal satisfaction
 - a. Glory, status, recognition.

- b. Outlet for aggression not permitted the female in many other activities in society.
- c. Need and desire to master skills. The need to succeed; to complete something at a high level of effectiveness; ambition to accomplish.
- d. Desire for attention of adult (p. 7).

Several researchers explore the possibility that certain background factors contribute to the sport involvement of women. A number of studies investigate the relationship between such factors as family size, sibling order, socioeconomic status, parental attitudes, influential figures, and involvement in sport. Berlin (Gerber et al., 1974) summarizes these inquiries as giving "no clear evidence concerning the antecedents of female adult competitive sport involvement (p. 346)."

Theoretical Explanations

Metheny (1965), in "The Woman's Look in Sport," hypothesizes that it is the nature of sport itself that explains the involvement of women. According to Metheny, sport is a recreational diversion, and as such, is the only recreational activity that offers the satisfaction of movement experiences (p. 164). More importantly, sport provides opportunity for self-testing in a competitive situation that is better defined and less threatening than other competitive situations in life. Sport is structured by rules, limited in time and space, and has an explicit outcome that has no permanent or drastic effect on the athlete's life (p. 165). Therefore, sport is a segment of life in which a woman can "compete openly, freely, fully in situations where the purpose of the moment is defined as competition (p. 164)." From such competition the individual learns about

herself, her abilities, her reactions to success and failure, and she evaluates herself in specific terms that few situations other than sport provide. Metheny cites several factors that influence the choice of specific sports: individual ability, accessibility of facilities and instruction, socioeconomic status, mores and attitudes of the culture regarding sport for women (p. 165). However, it is the renewing, revealing nature of sport that attracts women. Sport, according to Metheny, satisfies a human need: the "need for a diversion and testing ground larger than a chessboard but smaller than life itself (p. 165)."

Price (1970), exploring the role of emotion in sport for women, attempts to express emotions in sport through verbal and pictorial images. It is her contention that the emotional aspect of sport, often ignored in sport literature, is the factor which attracts women to sport and maintains their involvement. Sport, according to Price, assumes a significant role in a woman's life:

Sport holds a mirror to a woman's life
all that she can know

of joy
or sadness

sports finds its counterpart in sport
she learns not only how she moves
but how she feels
and thinks
and struggles
and how she is tormented
triumphs
and then finds peace

as she absorbs the

mood
drama
emotion

which are the essences of her sport
so she discovers
all the inward stresses
that move her being (p. 13).

Sport, as Price describes it, is an intensely personal phenomenon, and it is the revealing, penetrating, emotional nature of sport that motivates women to engage in it.

Based on the works of behavioral psychologists, Butt (1971) formulates three hypothetical models of sport motivation: (a) aggression, (b) neuroticism, and (c) competence. Each model is illustrated by the case history of a female tennis player. The proposed models are intended to facilitate the study of sport behavior "within its social context, that is, in terms of the effect upon and in relationship to the development of individuals and of groups (p. 3)." This frame of reference is essential, according to Butt, because of her assertion that it is possible to foster the development of certain attitudes and values in sport and discourage the development of others (p. 3).

The aggression model is based on the work of Lorenz who conceptualized a psychohydraulic model of human motivation in which the individual has a reservoir of energy which must be released. This instinctive fund of energy is the source of aggression. The aggression model of sport motivation assumes that the person with the greatest energy reserve will be the most highly motivated to engage in sport in order to release her energy, and hence, aggression (p. 5).

The Freudian concept of "neurotic conflict" is incorporated into the neuroticism model; the individual must learn to sublimate basic drives such as sex and aggression into socially acceptable behaviors. According to the neuroticism model, "all sport motivation arises out of personal conflict between opposing forces of personality (p. 6)." The athlete, operating under this model,

sublimates basic drives and expresses them through sport.

Regarding the competence model, Butt states that the "ability to deal effectively with the environment is the essence of the theory (p. 8)." According to the theory of competence motivation, as the individual interacts effectively with the environment, feelings of confidence, well-being, and mastery are developed. Because of the athlete's desire to affect and master the environment through sport and the satisfaction derived from this mastery, Butt concludes that athletes demonstrate competence motivation. She states, furthermore, that the competence model is the most constructive and desirable motivation model for sports participation of the three presented (p. 12).

Small (1970) attempts to derive a model of the achievement motivation of women athletes using an experimental procedure. She develops a word checklist representing various facets of sport participation. Words are categorized in three descriptive structures: (a) cognitive, (b) physical, and (c) emotional. They are judged in terms of semantic similarity, word objects, and potency. Women collegiate varsity athletes from several sports respond to words on the checklist which have attracted them to sport or are attractive to them. A hypothetical model is derived from the words to which the athletes respond. Self-esteem and ego-involvement are conceptualized as the two major dimensions of women's sport motivation. Belongingness and active and passive dynamic involvements are recognized as facets of the ego-involvement motive, while mastery, prestige, and self-regard are subsumed within the self-esteem motive (Gerber et al., 1974, p. 333).

The research into women's sport motivation to which this study is closely tied is the effort by Berlin (1971, 1972b, 1973; Gerber et al., 1974) to identify a hypothetical structure of female athletic motivation. In effect, this inquiry may be considered to be a part of Berlin's larger and on-going research. An explanation of the prior work on the Berlin model is offered in the previous chapter.

Summary of the Literature Review

Research about achievement motivation confirms the appropriateness of applying need to achieve theory to the sport context. The value of the Q-technique in the process of theory-testing is documented. Background literature on women's sport motivations indicates that there is little existing knowledge about the motives of the female to engage in sport. Most studies have been speculative in nature. Berlin's (1971, 1973; Gerber et al., 1974) investigations represents the most extensive effort to define women's sport motivation in terms of an experimentally derived model.

CHAPTER III

PROCEDURES

In this study of the motivation of women collegiate athletes, the investigator reviewed the related literature and then formulated, specifically, the framing questions to which the inquiry is addressed. Thereafter, the following procedures were followed in completing the study.

Selection of Female Athletes

This investigation pooled the responses of 224 female athletes from 25 athletic squads to the sorting of self-reference statements. These women represented 12 colleges/universities and seven different collegiate sports. The writer was responsible for obtaining sorts of 35 of these female competitors. Other data were obtained by Berlin and were not previously analyzed. All of the data utilized in the present study were collected during the 1971-72 and 1972-73 academic years. See Appendix A for a listing of the institutions and sports represented in the athlete-pool.

After a list of selected women's athletic teams was compiled, a type-written letter was sent to the coach of each team asking him/her to participate in the study by allowing the investigator to administer the Q-sort to the members of the team. The letter advised the coach that he/she would be contacted by telephone as a follow-up and to arrange a testing session if there was agreement to participate. Teams affiliated with the investigator's own university were

solicited by personal contact with the coach. Four coaches responded positively to the inquiry. See Appendix B for a copy of the letter sent to coaches.

Instrumentation

The research strategy employed in this study utilizes a rank-ordering technique suggested by Q-methodology in which the tentative theory to be tested is embodied in the sorting instrument. The procedure yields a response sort which is designated as forced-choice because it fits an approximate normal distribution.

The 60-item sort used in this study is a revised version of an 80-item sort developed by Berlin and utilized in her initial investigation (Berlin, 1971; Gerber et al., 1974). Personality theory, published personality tests, sport literature, research on skill learning and performance, physical education literature concerning women's athletics, studies utilizing Q-methodology, and responses by women collegiate athletes to the question, "Why do you participate in varsity name of sport?" were the sources for the original items in the 80-item sort. A panel of selected judges, sport psychologists and experienced women athletes, established the content validity of the statements (Berlin, 1971). Subsequent comparisons of pre- and post-season sorts of women collegiate gymnasts were not significantly different (Berlin, 1972a). Thus, the reliability of the instrument was supported.

A principal component factor analysis of responses on the 80-item sort led Berlin (1973) to modify the theoretical model. These changes necessitated a revision of the statements representing the sort. Among the changes were:

(a) elimination of statements not loading on the five extracted factors; (b) rewording of statements loading on more than one factor, (c) redesigning of the hypothetical model so that each of the 15 cells contained within the structure were represented by four self-reference statements that were appropriate to both broad descriptive motive categories and so-called personal derivatives (Berlin, 1973). In making these changes, Berlin asserted that the reduction of sort statements made the data-gathering process more expedient. No validity and reliability data were reported on the 60-item sort.

Sort Administration

In obtaining data, the investigator followed the same procedures established by Berlin. For example, coaches who agreed to take part in the research were contacted by the investigator and arrangements were made for a testing session with each squad. The coach selected a time when the team members could meet as a group. The actual sorting task was done in a quiet room in which each subject was given adequate space and unlimited time.

Each participating athlete was provided with a deck of 60 cards, a response sheet, and a pencil. On each 3 x 5 card was typed one of the 60 self-reference statements. A complete list of the statements and their intended meanings within the hypothetical model is included in Appendix C. Respondents identified themselves on the sort form; they were given the option of using a fictitious name if preferred. The Lynn Achievement Motivation Questionnaire

was also administered during the session.¹ See Appendix C.

Verbal directions for the sorting procedure were given by the investigator. A copy of the directions is included in Appendix C. Subjects were directed to sort the 60 statements, which purportedly describe thoughts, feelings, or behaviors, into 11 categories along a continuum ranging from "most like me" on the left to "least like me" on the right. The sort was forced to fit the following approximately normal distribution:

Self-reference	MOST LIKE ME								LEAST LIKE ME		
	A	B	C	D	E	F	G	H	I	J	K
Column	A	B	C	D	E	F	G	H	I	J	K
Cards per pile	2	3	4	7	9	10	9	7	4	3	2

The distribution was diagrammed on the sort response sheet by 11 columns of 60 boxes. See Appendix C. By recording the appropriate statement number indicated on each card in a column on the sort form, the task of ordering the statements was completed. One method of sorting was suggested, e.g., fixing the extreme most and least like me statements and then working toward the center. However, observation of subjects during the sorting revealed that many of them devised their own methods.

There was no time limit for the sorting task; each athlete was given as much time as she needed to arrange all of the statements. After the instructions were given and questions answered, subjects were not interrupted unless they

¹The responses to this checklist were gathered to contribute validation data to Berlin's on-going study of the motivation of women collegiate athletes. No treatment or analysis of the obtained responses is presented in this study.

requested assistance from the investigator in locating an error. As sorters completed the task, they returned the materials and left the room. For all data reported in this study, the same sort administration procedure was used.

Organization of Data for Analysis

All response forms were first scanned for accuracy and completeness. In some instances a number was repeated and another statement omitted. Sixteen sorts were eliminated because of sorting errors. Five sorts were eliminated because subjects had been tested previously while participating on another varsity team or during the previous season. Their original sorts, included in Berlin's data, were used in the analysis.² In all, 21 sorts were discarded, leaving the number of athletes participating in the study at 224.

Numerical values were assigned to each statement of each sort in accordance with the following distribution:

Self-reference	MOST LIKE ME							LEAST LIKE ME			
Cards per pile	2	3	4	7	9	10	9	7	4	3	2
Numerical value	10	9	8	7	6	5	4	3	2	1	0

Thus, the two statements in the extreme left column were assigned values of ten, and the two in the extreme right column were assigned values of zero. The statements in the remaining nine columns were assigned successive integral values between ten and zero.

²These responses were gathered to contribute to the sort-resort reliability data for the 60-item sort in Berlin's on-going study.

The numerical values of the statements were recorded on a translation sheet. The data were coded on Fortran Coding Forms and then punched onto IBM cards for computing. See Appendix C for a sample numerical conversion sheet and the coding plan.

Treatment of Data

The data were analyzed using a principal component factor analysis program from the Statistical Package of the Social Sciences. All computing was done at the University of North Carolina at Greensboro Academic Computing Center.

Two major treatments were used: (a) calculation of descriptive statistics and (b) factor analysis. The determination of means and standard deviations was undertaken to reveal the extreme most and least like me statements and the extent to which they represented basic motive categories and personal derivatives. The pervasiveness of these structural elements of the model are important to the validity of the theory represented by the model.

Factor analysis was undertaken to suggest, in a much more sophisticated way, alternative meanings underlying athletes' responses. It is based on the idea that factor analysis is capable of disentangling the complex interrelationships in the data and determining the number and nature of the underlying factors.

The correlation matrix for the 60 statements based on the sort responses of 224 women athletes was factor analyzed using a principal component factor

analysis.³ In an attempt to approximate a simple-structure factor matrix, an orthogonal rotation of factors, using the Varimax rotation technique (Edwards, 1970; Kaiser, 1958), was made. The eigenvalue⁴ greater than one criterion (Edwards, 1970, p. 83), was used in determining the number of factors to be rotated.

The percentage of total variance accounted for by each of the 21 rotated factors was calculated by the researcher with the aid of an electronic desk calculator.

³This factor analytic technique defines the basic orthogonal dimensions of the data in such a way that the first factor extracted accounts for the largest proportion of the variance, the second factor, the next largest, and so on until all the variation in the data is accounted for by the factors. This represents a unique factor solution for the given correlation matrix (Rummel, 1970, p. 142).

⁴Eigenvalues equal the sum of the column of squared loadings for each factor. They represent the amount of variation accounted for by a factor (Rummel, 1970, p. 144).

CHAPTER IV

ANALYSIS OF DATA

The examination of obtained data is presented as follows: (a) summary of descriptive statistics for the sort statements and (b) summary of the statistics derived from a factor analysis of the correlations among the statements.

Descriptive Statistics

Table 1 identifies the nine statements which were assigned the highest numerical values and the ten statements which were assigned the lowest numerical values. This takes into account the extreme three most and least like me columns of responses. Means, standard deviations, motive categories, and personal derivative designations are indicated. The range of the means on a ten point scale is from a high of 7.589, received by statement #6, "I take pride in being an athlete," to 1.509, the mean value of statement #32, "A difficult thing for an athlete to do is to maintain friends." A complete list of statement means and standard deviations is included in Appendix D.

All three motive categories are represented in both the nine statements with highest means and the nine statements with lowest means. Thus, the complexity of the motivation structure and the pervasiveness of the broad motive categories are supported. However, the same pattern is not true for the personal derivative designations. Only the personal derivatives, the maneuvering for accomplishment, the gratification of role interests, and the consequences of

TABLE 1

DESCRIPTIVE DATA: NINE "MOST LIKE ME" AND
NINE "LEAST LIKE ME" Q-SORT STATEMENTS

Statement	Mean	S. D.	Rank	Motive Category	Personal Derivative
<u>Most Like Me</u>					
6	7.589	1.858	1	R	III
57	7.201	1.599	2	D	III
48	6.987	2.338	3	R	IV
7	6.794	1.868	4	M	IV
44	6.772	1.850	5	M	II
34	6.754	1.726	6	D	II
59	6.665	2.115	7	M	III
60	6.625	1.788	8	M	III
16	6.567	1.511	9	D	II
<u>Least Like Me</u>					
32	1.509	1.476	60	D	IV
55	1.781	1.586	59	D	I
49	2.527	1.927	58	M	I
19	2.710	1.800	57	D	IV
20	3.094	1.852	56	R	I
29	3.137	1.607	55	M	I
41	3.388	2.352	54	D	I
26	3.513	2.313	53	D	V
40	3.589	1.772	52	M	V

Scale = 0 - 10

N = 224

affiliation are represented among the statements with highest means. The set of statements with lowest means include only the personal derivative categories, the experience of stress, consequences of affiliation, and the satisfaction of adjustment and recognition. The consequences of affiliation is the only personal derivative that appears within both extreme groups of statements. On the basis of this finding, the notion of designating personal derivatives in the theory underlying women's sport motivation is questionable. At least the rigidity of these elements as vertical components of the model is non-valid.

Comparison of mean rankings obtained in this study with those reported by Berlin (1971) yields interesting results. Berlin identified the 12 statements in the 80-item sort assigned highest numerical values and the 12 assigned lowest numerical values. As in the present inquiry, this takes into account the three extreme columns at each end of the sort distribution.

Thirteen of the statements identified in Table 1 above, have a corresponding statement in the 80-item sort. Some of the paired statements have identical wordings. In others the wording has been modified, but the meaning is essentially the same in both statements. Four of the statements assigned high numerical values in this study also received high values in Berlin's study. The same is true for four of the statements identified as having low means. One statement, #16 in the present study, was revised from the original to have a diametrically opposite meaning. This statement was ranked ninth in the 60-item sort; seventy-ninth in the 80-item sort. Tests are needed to establish the reliability of the sort instrument. However, these findings suggest that the

women athletes' perceptions of the Q-statements are consistent.

Factor Analysis

Unrotated Data

The unrotated factor matrix identified eigenvalues, percentage of variance accounted for by each factor, and cumulative percentage of variance accounted for by the factors. Twenty-one factors, having eigenvalues greater than one--an accepted cut-off criterion--are summarized in Table 2. It should be noted that this accounts for 65.7% of the total variance.

The communalities¹ of the variables on the 21 factors range from a high of .858 for statement #38 to a low of .528 for statement #25. Thus, the total variance of a statement that can be accounted for by the factors is between 85.8% and 52.8%. A printout of statistics from the unrotated matrix is appended. See Appendix D.

Analysis Following Varimax Rotation

Rotation of factors essentially shifts the analysis from factors maximizing total variance to factors delineating highly intercorrelated variables (Rummel, 1970, p. 377). In this process, the proportion of variance accounted for by the 21 rotated factors remains equal to the proportion of variance accounted for by the 21 unrotated factors (Edwards, 1970, p. 81). However, the proportion of variance accounted for by the unrotated factors is "spread out" over the rotated

¹The communality of a variable is the proportion of the variable's total variance that is accounted for by the factors. It is computed by summing the squared factor loadings of the variable (Rummel, 1970, p. 142).

TABLE 2

EIGENVALUES, PERCENTAGE OF VARIANCE, AND CUMULATIVE
PERCENTAGE OF VARIANCE FOR THE FIRST 21
UNROTATED FACTORS

Factor	Eigenvalue	% of Variance	Cumulative % of Variance
1	4.683	7.8	7.8
2	4.051	6.8	14.6
3	2.937	4.9	19.5
4	2.674	4.5	23.9
5	2.292	3.8	27.7
6	2.172	3.6	31.3
7	2.042	3.4	34.8
8	1.739	2.9	37.7
9	1.701	2.8	40.5
10	1.637	2.7	43.2
11	1.479	2.5	45.7
12	1.435	2.4	48.1
13	1.335	2.2	50.3
14	1.276	2.1	52.4
15	1.226	2.0	54.5
16	1.193	2.0	56.5
17	1.172	2.0	58.4
18	1.166	1.9	60.4
19	1.129	1.9	62.4
20	1.062	1.8	64.0
21	1.031	1.7	65.7

factors. Thus, the rotated factors tend to account for more nearly the same magnitude of variance than the unrotated factors (Rummel, 1970, p. 381). This has an important implication for analysis: no significance is attributed to the order of the rotated factors as is done with factors derived from a principal component analysis. The percentage of variance and cumulative percentage of variance figures for the 21 rotated factors are summarized in Table 3. A print-out of the Varimax rotated factor matrix is included in Appendix D.

The first step in the analysis of the Varimax rotated factor matrix was deciding how many of the 21 rotated factors to interpret. This decision was based on several criteria. One approach, according to Edwards (1970), is to decide the proportion of the total variance that is to be accounted for and to extract the necessary number of factors to account for this quantity (p. 83). Rummel (1970) states that the majority of the variance in the data will be accounted for by the first several factors. The last few factors will describe only a small portion of the variance, and can, therefore, be omitted from the analysis (pp. 343-344). Accordingly, the first 15 rotated factors, accounting for 49.9% of the total variance in the data, are included in the analysis.

Statements with loadings² of greater than ± 0.30 on a factor are considered as having a high loading on the factor and are used in interpreting the factor in this study. This cut-off point limits factors to statements with approximately 10% or more of their variation involved in a factor. Since, as Kerlinger (1964)

² A factor loading is a correlation coefficient between a variable and a factor (Rummel, 1970, p. 137).

TABLE 3

PERCENTAGE OF VARIANCE AND CUMULATIVE PERCENTAGE
OF VARIANCE FIGURES FOR THE 21 ROTATED FACTORS

Factor	% of Variance	Cumulative % of Variance
I	5.7	5.7
II	4.8	10.5
III	3.6	14.1
IV	3.2	17.3
V	4.0	21.3
VI	3.2	24.5
VII	3.0	27.5
VIII	3.3	30.8
IX	3.5	34.3
X	3.0	37.3
XI	2.7	40.0
XII	2.6	42.6
XIII	2.3	44.9
XIV	2.5	47.4
XV	2.5	49.9
<hr/>		
XVI	3.2	53.1
XVII	2.7	55.8
XVIII	2.3	58.1
XIX	2.5	60.6
XX	2.6	63.2
XXI	2.3	65.5

points out, there is no generally accepted standard of error on factor loadings (p. 654), this is a somewhat arbitrary decision. However, Childs (1970) comments that "compared with other criteria, this is quite a rigorous level so we are not taking much for granted (p. 45)."

Fifty of the 60 Q-statements, 83%, have high loadings on at least one of the first 15 rotated factors. Thirty-eight of these statements load on only one factor. Thirteen load on two factors, and only one statement, #28, loads on three factors. The statements with high loadings on the 15 rotated factors are presented in Table 4.

Following are some of the guidelines that were used in interpreting the factors: (a) the size of the factor loadings determined the relative weight of the statement in naming the factors, (b) negative and positive loadings were viewed as denoting oppositional meanings which contribute to the "general" sense of a factor, and (c) statements loading on more than one factor were considered in the naming of only one factor. The 15 factors, essential components of the motivation construct of collegiate women athletes, are interpreted below.

Factor I: The motive category, D, opportunities for dynamic interaction, is not represented among the eight statements having high loadings on this factor. Statement content suggests a responsiveness to the challenges offered by striving to meet goals and demands. In addition to this goal orientation, a strong theme of dedication and determination is expressed. It seems that an appropriate name for the motive, derived from these statements, is "commitment to goals."

TABLE 4
FACTOR ANALYSIS SUMMATION OF FIRST 15 ROTATED FACTORS

Factor	Loading	Statement	Model	Cell
I	.567	* 1. Sometimes I don't think I'm really <u>good</u> enough to reach my goals.	M	III
	-.449	3. My belief in myself influences me to do many of the things I choose to do.	R	III
	-.436	*18. I am determined to be a success.	R	II
	-.745	*23. I make strong demands on myself and take pride in doing so.	R	I
	.313	24. In the closing moments of a game, time often becomes another element to be conquered.	M	I
	-.308	36. I strive to be "the best."	M	V
	-.619	*52. I work steadily at satisfying my own performance standards.	M	II
	-.733	*59. Once I make up my mind to do something I really work at it.	M	III

*Statement loads on only one factor.

TABLE 1 (Continued)

Factor	Loading	Statement	Model	Cell
II	.677	*13. It is difficult for me to accept failure.	R	V
	-.301	28. I recognize when I "deserve" to lose.	R	V
	.416	29. Just before a big event, I think of the "chance things" that happen that I cannot control.	M	I
	-.736	*31. I have the capacity to recover easily from failures that occur in my performance.	R	II
	.376	49. The idea of losing "hangs" over me all season long.	M	I
	.399	50. When I have to be a so-called "good loser," I disguise my innermost feelings.	D	V
	.398	53. I get "worked-up" easily in a close contest.	D	I
	-.540	*58. I consider myself to be an emotionally controlled competitor.	R	III
	.449	*10. I like the discipline of training.	M	V
III	-.341	*15. I trust myself to avoid serious injury.	R	IV
	-.302	29. Just before a big event, I think of the "chance things" that might happen that I cannot control.	M	I

TABLE 4 (Continued)

Factor	Loading	Statement	Model	Cell
IV	.774	*45. I don't mind extra workouts in order to gain more precise control of my skills.	M	IV
	.356	49. The idea of losing "hangs" over me all season long.	M	I
	.413	51. In sport, I accept being told what to do by others.	D	V
	.420	*60. In order to be a winner, I know that I have to keep putting out more and more all the time.	M	III
	-.767	*11. Once a contest gets underway, I'm too involved to be aware of my nervousness.	M	I
	.503	*20. The build-up of pressure just prior to competition interferes with my desire to perform.	R	I
	-.504	24. In the closing moments of a game, time becomes another element to be conquered.	M	I
V	.498	30. I like proving that I am skilled by competing in sports.	M	III
	-.342	25. Rationalization is occasionally necessary in sport.	R	V
	.669	36. I strive to be "the best."	M	V

TABLE 4 (Continued)

Factor	Loading	Statement	Model	Cell
	.832	*37. I have confidence about my insights into certain sport situations.	R	IV
	.892	*38. I know what is best and I can give it in the excitement of competition.	R	I
VI	.793	*32. A difficult thing for an athlete to do is to maintain friends.	D	IV
	.576	55. Sometimes I think that as an athlete I am a social outcast.	D	I
VII	-.444	19. The loneliness of being an athlete cannot be shared with others.	D	IV
	.749	*34. Playing and/or practicing provides a "release" that makes me feel good.	D	II
	-.795	*41. Sport does not provide an "escape" from personal pressures.	D	I
VIII	.721	* 6. I take pride in being an athlete.	R	III
	-.387	*17. It is hard to be aggressive against a likeable opponent, e.g., one who is kind and acts friendly.	D	II
	-.305	28. I recognize when I "deserve" to lose.	R	V
	.322	30. I like proving that I am skilled by competing in sports.	M	III

TABLE 4 (Continued)

Factor	Loading	Statement	Model	Cell
	-.302	*39. When I feel that I at least performed well, I don't mind losing.	R	II
	.754	*48. I feel proud when I engage in sport.	R	IV
IX	.317	3. My belief in myself influences me to do many of the things I choose to do.	R	III
	.345	*42. I keep my ambitions and my abilities in good relationship.	R	II
	-.731	*47 To relieve my anxieties is hard work.	M	V
	-.756	*56. I am a naturally nervous person.	R	I
X	-.628	* 7. I have been able to cultivate many friendships as a result of sport involvement.	M	IV
	-.791	*54. I have particularly "close" feelings with my teammates.	D	IV
XI	.369	25. Rationalization is occasionally necessary in sport.	R	V
	.336	28. I recognize when I "deserve" to lose.	R	V

TABLE 4 (Continued)

Factor	Loading	Statement	Model	Cell
	-.370	*43. Participation in sport keeps open a world of social experiences to me, e.g., travel, meeting new people, etc. . . .	D	IV
	-.713	*57. There are special kinds of excitement and thrills that go along with participating in sport.	D	III
XII	.536	* 9. Sport provides a way for me to continue some of my early interests.	D	III
	.668	*14. Sport makes it possible for me to realize my ambitions.	R	V
	-.472	50. When I have to be a so-called "good loser," I disguise my innermost feelings.	D	V
	.378	51. In sport, I accept being told what to do by others.	D	V
XIII	-.433	19. The loneliness of being an athlete cannot be shared with others.	D	IV
	.758	*21. I organize my life effectively to allow for my sport participation.	M	IV
	-.349	55. Sometimes I think that as an athlete I am a social outcast.	D	I
XIV	.835	*26. There are worse things in life than being lonely.	D	V
	-.329	*35. It is important that I am liked by the opposite sex.	D	III

TABLE 4 (Continued)

Factor	Loading	Statement	Model	Cell
XV	.538	* 5. It is hardly worthwhile, nowadays, to try to be "socially accepted."	D	II
	.705	*27. It is rough to keep in shape out of season.	M	II
	.321	53. I get "worked-up" easily in a close contest.	D	I

Factor II: All basic motive categories are represented among the eight statements comprising this factor. The threat of failure in sport is clearly expressed. The positively loaded statements connote an apprehension of failure and a difficulty in adjusting to it: "It is difficult for me to accept failure," and "The idea of losing 'hangs' over me all season long." Negatively loaded statements such as "I have the capacity to recover easily from failures that occur in my performance" suggest tolerance of actual or possible failure. Factor II lends to the label "coping with failure."

Factor III. This factor consists of seven statements designating all three motive categories. Various demands and threats that exist as a result of involvement in competitive sport are enumerated: "discipline of training," "chance things' that might happen," "extra workouts," "being told what to do," and "serious injury." A personal "coming to terms" with these components of the sport experience can be inferred from the statements. Factor III is labeled "skill-related adjustment."

Factor IV: None of the four statements constituting Factor IV represents the motive category, D, opportunities for dynamic interaction. Statement content is indicative of the heightened pressures and stress that are inherent in the sport situation. One can infer the notion that the athlete is subject to influence by these intensified pressures--the effect may be favorable or detrimental. "Responsiveness to pressure" seems to be an appropriate designation for this factor.

Factor V: The motive categories, contribution to self-regard and challenge of mastery, are represented in the four statements identifying Factor V. A theme of belief in oneself as a capable individual is discernible in the three highest loading statements: a belief in one's ability to know what is best, give what is best, and be the best. An appropriate name for this factor is "self-confidence."

Factor VI: The two statements loading on Factor VI are designated within the motive category, D, opportunities for dynamic interaction. The notion expressed in the statements is a concern for the social role of the athlete: "A difficult thing for an athlete to do is to maintain friends," and "Sometimes I think that as an athlete I am a social outcast." An accurate label for Factor VI is "sociability."

Factor VII: The only motive category represented in the three statements constituting this factor is D, opportunities for dynamic interaction. The phrases "provides a 'release' that makes me feel good," and "provide an 'escape' from personal pressure," attribute a cathartic effect to sport. A name that appropriately summarizes this factor is "release."

Factor VIII: The six statements identifying this factor represent the three basic motive categories. The two highest loading statements are very similar in wording and acknowledge a feeling of satisfaction that is derived from identity as an athlete. One can infer from the statements the idea that the competitive role is a highly personal, pleasing, self-satisfying one. Factor VIII can

be appropriately labeled "ego-gratification."

Factor IX: The four statements comprising Factor IX are designated within the R, contribution to self-regard, and M, challenge of mastery, motive categories. The statements attest to the existence of some anxiety with which the athlete must deal: "To relieve my anxieties is hard work," and "I am naturally a nervous person." Other statements indicate the possibility of tension existing between "ambitions and abilities" and pressures influencing the things one does. Factor IX lends to the name, "anxiousness."

Factor X: The motive categories, D and M, opportunities for dynamic interaction and challenge of mastery, are represented in the two statements constituting this factor. The cultivation of "many friendships" and "particularly 'close' feelings with my teammates" acknowledge various relationships that exist within and as a result of sport involvement. The idea that the athlete enjoys fellowship through sport is expressed in this factor. A name accurately summarizing Factor X is "belongingness."

Factor XI: The four statements identifying Factor XI are designated within the motive categories, R, self-regard, and D, dynamic interaction. The highest loading statements suggest that competitive sport is inherently exciting and challenging. The statements include such phrases as "a world of social experiences . . . travel, meeting new people," and "special kinds of thrills and excitement." A name describing Factor XI is "adventure."

Factor XII: R, contributions to self-regard, and D, opportunities for dynamic interaction, are the motive categories represented in the four statements loading on Factor XII. The notion that sport is used by the athlete as a means to accomplish very personal ends is discernible in this factor. Sport is viewed as an instrument that enables the competitor to "continue some of my early interests" and "realize my ambitions." An appropriate name for Factor XII is "self-interest."

Factor XIII: The three statements defining Factor XIII do not represent the motive category, R, contributions to self-regard. A theme of capability in managing various aspects of sport involvement is expressed: effective organization of one's life, and competence in social relationships and communicating one's emotions. "Effectiveness" is an accurate description of this factor.

Factor XIV: Both statements comprising Factor XIV are classified within the D, dynamic interaction, motive category. In this factor one can detect a de-emphasis on the social role. The statements suggest an acceptance, even a preference, for loneliness and less involved social relationships that could result from competing in sport. One can infer from the statements that the athlete must accommodate the effect sport has on her social life. Factor XIV lends to the name, "social accommodation."

Factor XV: The three statements loading on Factor XV represent the M, challenge of mastery, and D, opportunities for dynamic interaction, motive categories. An element of personal conflict is expressed in this factor: conflict

between the athlete and social norms and conflict with the demands of sport on her life. Statement content indicates an adaptation by the competitor to such conflicts. A name describing Factor XV is "conflict adaptation."

The status of the collegiate women's sport motivation model is presented in light of the data obtained and analyzed in the present investigation. The findings of this research are interpreted with respect to restructuring, i.e., relating the model and the explanation of women's sport motivation to previous research. This chapter also summarizes the present inquiry and offers contributions to the specific questions which framed this research.

Discussion

Barling's (1974) notion of theory-testing by means of Q-sort suggests that the theory of collegiate women's sport motivation as conceptualized by the researcher can be tested by means of Q-sort. The Q-sort technique is a method of data collection and analysis which is based on the concept of a Q-sort. The Q-sort is a technique of data collection and analysis which is based on the concept of a Q-sort. The Q-sort is a technique of data collection and analysis which is based on the concept of a Q-sort. The Q-sort is a technique of data collection and analysis which is based on the concept of a Q-sort.

Any attempt to determine validity is ultimately an arbitrary and subjective process. It rests heavily upon the judgments of the investigator. The following commentary is offered in hopes of evaluating the validity of the study and investigation.

Clearly, the factor analysis does not completely support the proposed structure of women's sport motivation. Although all three main

CHAPTER V

DISCUSSION, SUMMARY, AND CONCLUSIONS

The status of the collegiate women's sport motivation model is presented in light of the data obtained and analyzed in the present investigation. The findings of this research are interpreted with respect to restructuring, i.e., refining, the model and the explanation of women's sport motivation it purports to represent. The chapter also summarizes the present inquiry and offers conclusions to the specific questions which framed this research.

Discussion

Kerlinger's (1964) notion of theory-testing by means of Q-sort suggests that if the theory of collegiate women's sport motivation as conceptualized by Berlin is valid and if the sort adequately expresses the theory, then the statistical analysis will support the theory's validity. However, the validity of the Q-sort, per se, is a basic assumption underlying the study; the issue of validity is therefore dependent upon the results of the factor analysis.

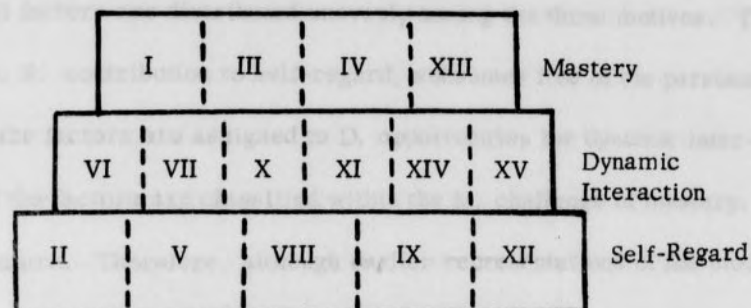
Any attempt to determine validity is admittedly both arbitrary and conjectural. It rests heavily upon the judgments of the interpreter. Nonetheless, the following commentary is offered in hopes of evaluating the validity of the theory under investigation.

Clearly, the factor analysis does not completely support Berlin's proposed structure of women's sport motivation. Although all three basic motive

categories, the horizontal structures in the model, are affirmed as pervasive elements in the motivational structure, the viability of the personal derivatives, the vertical columns, is seriously questioned as a result of this study. The five designations were not identifiable among statements with extreme "most like me" and "least like me" means. Furthermore, they failed to be adequately represented in the factors extracted from the analysis of the sort responses. These shortcomings dictate that in restructuring the model, personal derivatives as columnar vertical structures be eliminated from the design.

In place of the neat and orderly fixed vertical structures, the researcher proposes the following personal factors, derived from the present analysis, be appropriately designated in the refined model. These personal factors, derived from women athletes' responses to Q-statements, are: (a) commitment to goals, (b) coping with failure, (c) skill-related adjustment, (d) responsiveness to pressure, (e) self-confidence, (f) sociability, (g) release, (h) ego-gratification, (i) anxiousness, (j) belongingness, (k) adventure, (l) self-interest, (m) effectiveness, (n) social accommodation, and (o) conflict adaptation.

The revised model, conceptualized by the writer and based on the results of this study, is depicted in Figure 2. The horizontal structure remains identical to that of Berlin's prior model. However, the personal derivative designations are omitted entirely. In their place, within the three motive categories are fifteen more specific factors which have their own identity and meaning yet also relate to the horizontal structure in which they have been placed.



Personal Factors:

- Factor I - Goal Commitment
- Factor II - Coping with Failure
- Factor III - Skill-related Adjustment
- Factor IV - Responsiveness to Pressure
- Factor V - Self-confidence
- Factor VI - Sociability
- Factor VII - Release
- Factor VIII - Ego-gratification
- Factor IX - Anxiousness
- Factor X - Belongingness
- Factor XI - Adventure
- Factor XII - Self-interest
- Factor XIII - Effectiveness
- Factor XIV - Social Accommodation
- Factor XV - Conflict Adaptation

Figure 2

Revised Model of Collegiate Women's Sport Motivation

Statement content and names assigned the various factors determined the exact location of the factors within specific motive categories. It is pointed out that the personal factors are distributed unevenly among the three motives. The motive category, R, contribution to self-regard, subsumes five of the personal factors. Six of the factors are assigned to D, opportunities for dynamic interaction. Four of the factors are classified within the M, challenge of mastery, level of the structure. Therefore, although earlier representations of the model and the present model are composed of 15 cells, there is little resemblance among the cells. Only the horizontal alignment is the same. The lack of vertical balance in the revision of the model is possibly more isomorphic with "real" sport motivation.

Lacking the rigidity and precise organization of the original model, the revised model is intended to reflect complexity. It represents further refinement of Berlin's earlier women's sport motivation model. This contention is supported by the fact that the personal factors constituting the revised model account for nearly 50% of the variation of the data from which they were derived. In contrast, the five personal derivatives of the previous model accounted for only 23% of the data variation. Furthermore, given the confounding and individualistic nature of the personality variables that the model purports to represent, it seems unlikely that the structure of sport motivation is as "neat" as the preceding Berlin versions. Intuitively, then, the revised model seems to be a more valid representation of the sport motivation of collegiate women.

This study yields no statistical assessment as such of the validity of the proposed model. Some evidence, though, suggests that the structure has validity. A need achievement frame-of-reference was established for the model. Fundamental to achievement motivation is the interaction of two motives, the motive to approach success and the motive to avoid failure. In the proposed model of women's sport motivation, the personal factor, goal commitment, is indicative of the need to succeed. Coping with failure, another personal factor, is highly suggestive of a fear of failure operative within sport motivation. The inclusion of these well-accepted achievement motives among the derived factors contributes to the credibility of the theory. Furthermore, the obtained strength of these factors, as interpreted by their eigenvalues and the amount of variance each accounts for as compared with the other factors, is a supportive finding.

In addition to the theory of achievement motivation, the proposed model is consistent with other explanations of sport involvement. Metheny's (1965) notion of sport as a diversion is acknowledged by the personal factors designated "adventure" and "release." Butt (1971) formulates a competence-based theory of sport motivation; the athlete desires to effectively influence her environment. From such mastery she experiences feelings of satisfaction and confidence. The basic motive category, mastery, and the three personal factors, effectiveness, ego-gratification, and self-confidence, accommodate Butt's conceptualization of competence motivation within the model.

Small's (1970) inquiry into the achievement motivation of women athletes represents the only other attempt to experimentally derive a model of this

attribute. The subcategory motives, mastery and self-regard, in Small's model are identified in the present model as basic motive categories. Small's subcategory motives, active and passive dynamic involvement, considered jointly, are very similar to the basic motive category, opportunity for dynamic interaction. Both models contain an element labeled "belongingness." The personal factors identified in the present study, goal commitment, sociability, self-interest, adventure, and skill-related adjustment are analogous to specific designations within Small's general category, active dynamic involvements. Anxiousness, responsiveness to pressure, and release, can likewise be likened to Small's elements within the general category, passive dynamic involvements. Thus, although the structures of the two models are different, the basic components are similar. The consistency, then, between the present model derived from perceptions of women athletes and speculative theories and experimental models lend general support to the validity of the model.

One question warranting consideration in assessing the validity of the proposed model is, "How valid can a model be that accounts for only 50% of the total variation of the data from which it is derived?" An attempt to answer this question is made by posing others. What is the nature of sport motivation? In the total behavioral context, that of performing, are there not other inputs, such as skill, which influence the end result? How much is motivation a factor in performance? How does it relate to other factors involved in performance? Until questions such as these are answered, there is no way of knowing how much of the data variation can be or should be accounted for by the factors comprising

the theory. Whether 50% of the total variation is an adequate amount to allow for interpretation and formulation of a valid model of the motivation of women collegiate athletes is a moot question. In the present study, the attempt to contribute to an evolving model of such a complex personality variable, the obtained cumulative variance of the 15 personal factors was regarded as a marked improvement over Berlin's previous findings.

Summary

The Q-sort responses of the 224 women collegiate athletes were analyzed in an attempt to test a tentative model of women's sport motivation as formulated by Berlin. Twelve colleges/universities and seven different sports were represented by the women in the athlete-pool.

The instrument used to test the theory was a single administration 60-item, forced-choice Q-sort. The sort was structured in such a manner that each of the 15 cells in the hypothetical model were represented by four specific Q-statements.

Sort responses were factor analyzed by means of a principal component analysis; the obtained matrix was orthogonally rotated using the Varimax rotation criterion. The analysis yielded the following results: (a) 15 factors accounting for 49.9% of the sort variance were extracted and interpreted and labeled, (b) 50 of the 60 Q-statements loaded on at least one of the factors; 13 of these loaded on two factors; only one statement loaded on three factors, and (c) obtained communalities supported the effectiveness of the factors in accounting for the variance of the individual statements. Analysis of descriptive statistics revealed

that the basic motive categories are pervasive elements of the motivation of collegiate women athletes; the categories referred to by Berlin as personal derivatives are not. Furthermore, the failure of the factor analysis to identify and/or define the personal derivatives as underlying elements of the sort, led to the conclusion that these designations in the model of women's sport motivations are not valid.

On the basis of the above findings, the model was restructured. The major change made in the revision was the elimination of the personal derivatives as a vertical structure imposed on the three basic motives. The 15 personal factors generated in this study are considered essential to the theoretical explanation of the motives of women athletes, and were therefore added to the revised model. They were assigned positions in such a manner that each personal factor represented a unit within one of the basic motive categories. Thus, the motive category, R, self-regard, contained five subcategory motives; D, dynamic interaction, six subcategory motives; and four subcategory motives were identified in M, mastery. The revised model is presented in Figure 2.

Conclusions

The following conclusions are based on the data collected and analyzed in this study. These are expressed in the form of responses to the questions which framed the inquiry.

1. How many factors are identifiable from the Q-statements, representing the theory under investigation?

Factor analysis of the sort responses yielded 15 factors that account for 49.9% of the variance in the data. Fifty of the 60 Q-statements have loadings of ± 0.30 on at least one of the obtained factors.

2. What names describe these motivational factors?

The names assigned to the personal factors are as follows:

(a) commitment to goals, (b) coping with failure, (c) skill-related adjustment, (d) responsiveness to pressure, (e) self-confidence, (f) sociability, (g) release, (h) ego-gratification, (i) anxiousness, (j) belongingness, (k) adventure, (l) self-interest, (m) effectiveness, (n) social accommodation, and (o) conflict adaptation.

3. What recommendations are there for further refining the model of women's sport motivations?

Eliminate the vertical structure of personal derivatives. Structure the 15 personal factors extracted in the present study so that each is assigned to an appropriate level of basic motive category and is contained as a single identifiable unit within that category.

Recommendations for Research

Although the present study substantiates Berlin's model of women's sport motivation to some degree, the status of the model must continue to be considered as evolving. The results of this inquiry provide suggestions for still further research. Some recommendations for continuing the precise identification of the motives of women collegiate athletes are:

1. Revise the Q-sort. Specifically, substitute 10 statements for those that did not load on any of the factors. Such new statements should be constructed or selected to reflect the personal factors designated in this study. Word the 14 statements that loaded on more than one factor so that each more specifically represents but one factor.
2. Test the reliability of the revised sort.
3. Submit the model as conceptualized in this inquiry to a test of validity by factor analyzing responses to the revised sort.

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APPENDIX

The following code has been used in the titles of the appendix:

Appalachian State University -- App

College of Business -- Waco

State College -- Sta

High Point College -- HP

Western College -- WCol

State University of New York -- SUNY

The College of William and Mary -- W and M

University of Massachusetts -- Mass

University of New Hampshire -- NH

University of North Carolina -- NC

University of Oregon -- Ore

State Teachers University -- W Pa

APPENDIX A

The following code has been used in the tables of the appendix:

Appalachian State University -- App

College of Wooster -- Woos

Elon College -- Elon

High Point College -- HP

Madison College -- Mad

State University of New York-Cortland -- SUNY

The College of William and Mary -- W and M

University of Massachusetts -- Mass

University of New Hampshire -- NH

University of North Carolina-G -- UNC-G

University of Oregon -- Ore

Wake Forest University - W For

RESPONSES CATEGORIZED BY SCHOOL AND SPORT

School	Field Basketball	Hockey	Golf	Lacrosse	Swimming	Tennis	Volleyball	# of Responses Collected	# of Responses Eliminated	# of Responses Analyzed
App	0	0	0	0	0	7	0	7	0	7
Elon	8	0	0	0	0	0	0	8	2	6
Woos	17	11	1	2	1	3	7	42	2	40
HP	0	13	0	0	0	9	0	22	1	21
Mad	0	0	0	0	0	11	0	11	0	11
SUNY	0	0	0	0	0	12	0	12	0	12
W and M	0	0	0	0	0	10	0	10	0	10
Mass	0	0	0	0	12	10	0	22	3	18
NH	0	0	0	0	0	12	0	12	0	12
UNC- G	11	19	6	0	0	21	12	69	11	58
Ore	0	18	0	0	0	0	0	18	2	16
W For	0	0	0	0	0	0	12	12	0	12
	—	—	—	—	—	—	—	—	—	—
Total	36	61	7	2	13	95	31	245	21	224

SUMMARY OF RESPONSES COLLECTED BY INVESTIGATOR

School	Sport	Number Collected	Number Eliminated From Analysis	Number Included in Analysis
Elon	Basketball	8	2	6
UNC-G	Basketball	11	3	8
UNC-G	Golf	6	3	3
UNC-G	Tennis	10	3	7
		—	—	—
	Total	35	11	24

LETTER TO COACHES

February 24, 1973

Box 303

Raleigh, North Carolina

27412

Dear Sir:

Dear Sir:

Dear Sir:

Dear Sir:

I am a graduate student beginning thesis research at the University of North Carolina at Chapel Hill. My interest is related to an ongoing investigation of the modification of human behavior that has been underway at UNC-CH.

I am sure you have the experience of your _____ team in error as discussed in my study if possible. Their _____ would involve the completion of a short questionnaire and a half-hour interview. I am sure you will be able to complete this study in thirty minutes, and I would be most grateful if you could complete the rest of my team that is dependent on you and your team.

The study will be followed by a telephone call within the next week to discuss the results of the study and to discuss your team.

Thank you for your time and consideration.

Sincerely,

George Smith

APPENDIX B

SAMPLE LETTER TO COACHES

February 24, 1973
Box 505
Pleasant Garden, North Carolina
27412

Coach
School
Address

Dear :

I am a graduate student beginning thesis research at the University of North Carolina at Greensboro. My thesis is related to an ongoing investigation of the motivation of women athletes that has been undertaken at UNC-G.

I would like to have the members of your _____ team to serve as subjects in my study if possible. Their participation would involve the completion of a short questionnaire and a self-inventory. The testing would require approximately thirty minutes, and I would come to _____ to administer the test at any time that is convenient to you and your team.

This letter will be followed by a telephone call within the next week to discuss with you the possibilities of testing your team.

Thank you for your time and consideration.

Sincerely,

Gladys Smith

MOST DIFFICULT TASK

You have a set of story cards, a diagram of "place" and a pencil. On each card there is a 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. In other words, you are to arrange the statements placing those you consider to be more like you at the left end of the diagram than those that are least descriptive of you at the other end. The remainder will fall somewhere in between.

The story diagram consists of boxes organized in eleven columns. In the center left column, A, record the number of the two statements that are MOST like you. In Column B, the three statements that are, in your judgment, next like you. In Column C, mark those that you feel. Do not use the exact number label. When you have completed the sorting, there will be a number in each box in the diagram.

There is no "right" or "wrong" answer. You are encouraged to take as much time as you wish for your thoughtful response. There are no "right" or "wrong" answers. You are encouraged to take as much time as you wish for your thoughtful response. There are no "right" or "wrong" answers.

There is no special way to go about sorting. One suggested way is to look at each card and decide whether the statement is like you or not. Place statements that are like you on the left; NOT LIKE you on the right. If decided in the middle, then place the card in the box that the MOST describes you and the next card in the box that the second MOST describes you. Then, place the card with the second MOST like you statement. Then,

SORT DIRECTIONS

You have a set of sixty cards, a diagram of "boxes" and a pencil. On each card there is a 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. In other words, you are 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 descriptive of you at the other and the remainder falling somewhere in between.

The sort diagram contains 60 boxes organized in eleven columns. 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, Column C, next most like you, etc. Do not use the same number twice. When you have completed the sorting, there will be a number in each box of the diagram.

There is no time limit. You are encouraged to take as much time as you need to give a thoughtful response. There are no "right" or "wrong" answers. When finished, the sort will represent your perceptions--obviously based on your own experiences.

There is no special way to go about sorting. One suggested way is to first read each card and decide whether the statement is like you or not. Place LIKE ME cards on the left; NOT LIKE ME cards on the right; un-decided 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. Then,

switch over to the least-like-you statements and locate the cards that will be represented in Column K on the diagram. Go through the un-decideds and place them right or left after a "second thought." Then identify three statements for Column B and three for Column J. Continue the process working from each end until you have sorted all the cards. When you are confident about your arrangement, record the statement numbers in the appropriate box on the diagram.

Be certain that your name (real or fictitious--whichever you elect to use) is on the diagram at the top right. This name must "match" the one you used on the first yes-no list of twelve questions.

Please return all cards, diagrams, pencils.

Q-SORT STATEMENTS

Model
Cell

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

Model
Cell

- D IV 19. The loneliness of being an athlete cannot be shared with others.
- R I 20. The build-up of pressure just prior to competition interferes with my desire to perform.
- M IV 21. I organize my life effectively to allow for my sport participation.
- R III 22. I rarely feel unsure of myself in sport as I do in other situations.
- R I 23. I make strong demands on myself and take pride in doing so.
- M I 24. In the closing moments of a game, time often becomes another element to be conquered.
- R V 25. Rationalization is occasionally necessary in sport.
- D V 26. There are worse things in life than being lonely.
- M II 27. It is rough to keep in shape out of season.
- R V 28. I recognize when I "deserve" to lose.
- M I 29. Just before a big event, I think of the "chance things" that might happen that I cannot control.
- M III 30. I like proving that I am skilled by competing in sports.
- R II 31. I have the capacity to recover easily from failures that occur in my performance.
- D IV 32. A difficult thing for an athlete to do is to maintain friends.
- M IV 33. Nobody can give 100% all the time.
- D II 34. Playing and/or practicing provides a "release" that makes me feel good.
- D III 35. It is important that I am liked by the opposite sex.
- M V 36. I strive to be "the best."
- R IV 37. I have confidence about my insights into certain sport situations.

Model
Cell

- R I 38. I know what is best and I can give it in the excitement of competition.
- R II 39. When I feel that I at least performed well, I don't mind losing.
- M V 40. I can drive myself when I have to in a contest although I do not like doing it.
- D I 41. Sport does not provide an "escape" from personal pressures.
- R II 42. I keep my ambitions and abilities in good relationship.
- D IV 43. Participation in sport keeps open a world of social experiences to me, e.g., travel, meeting new people, etc. . . .
- M II 44. I am usually able to find ways to do the things I like to do.
- M IV 45. I don't mind the extra workouts in order to gain more precise control of my skills.
- D I 46. My most important feelings cannot be readily translated into action.
- M V 47. To relieve my anxieties is hard work.
- R IV 48. I feel proud when I engage in sport.
- M I 49. The idea of losing "hangs" over me all season long.
- D V 50. When I have to be a so-called "good loser," I disguise my innermost feelings.
- D V 51. In sport, I accept being told what to do by others.
- M II 52. I work steadily at satisfying my own performance standards.
- D I 53. I get "worked-up" easily in a close contest.
- D IV 54. I have particularly "close" feelings with my teammates.
- D I 55. Sometimes I think that as an athlete I am a social outcast.
- R I 56. I am a naturally nervous person.

Model
Cell

- D III 57. There are special kinds of excitement and thrills that go along with participating in competitive sport.
- R III 58. I consider myself to be an emotionally controlled competitor.
- M III 59. Once I make up my mind to do something, I really work at it.
- M III 60. In order to be a winner, I know that I have to keep putting out more and more all the time.

Name _____

MOST

LEAST

like me

like me

[illegible]

LYNN ACHIEVEMENT MOTIVATION QUESTIONNAIRE

Name _____

Answer either yes or no whichever most appropriately represents your 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
9. Do you like gambling on raffles, pools, etc.? ☐ Yes ☐ No
10. Do you prefer bright reds and yellow to dull blues and greens? ☐ Yes ☐ No
11. Do you tend to be pessimistic and unconfident in difficult situations (e.g., interviews, etc.)? ☐ Yes ☐ No
12. Do you think success in life is largely a matter of luck? ☐ Yes ☐ No

Sport: _____

College/University: _____

Sex: _____

SAMPLE NUMERICAL CONVERSION SHEET

		# _____
1. _____	21. _____	41. _____
2. _____	22. _____	42. _____
3. _____	23. _____	43. _____
4. _____	24. _____	44. _____
5. _____	25. _____	45. _____
6. _____	26. _____	46. _____
7. _____	27. _____	47. _____
8. _____	28. _____	48. _____
9. _____	29. _____	49. _____
10. _____	30. _____	50. _____
11. _____	31. _____	51. _____
12. _____	32. _____	52. _____
13. _____	33. _____	53. _____
14. _____	34. _____	54. _____
15. _____	35. _____	55. _____
16. _____	36. _____	56. _____
17. _____	37. _____	57. _____
18. _____	38. _____	58. _____
19. _____	39. _____	59. _____
20. _____	40. _____	60. _____

DATA CODING PLAN

Card 1Columns

1 - 3	<u>Subject Number:</u> 001 to 245
5	<u>Sex:</u> 1 - Female, 2 - Male
7 - 8	<u>School:</u> 01 - Appalachian State University 02 - College of Wooster 03 - Elon College 04 - High Point College 05 - Madison College 06 - University of Oregon 07 - State University of New York-Cortland 08 - University of Massachusetts 09 - University of North Carolina-Greensboro 10 - University of New Hampshire 11 - Wake Forest University 12 - The College of William and Mary
10 - 11	<u>Sport:</u> 01 - Basketball 02 - Golf 03 - Hockey 04 - Lacrosse 05 - Swimming 06 - Tennis 07 - Volleyball
13 - 72	Values assigned to the first 30 statements of Q-sort

Card 2

1 - 12	Same as Card 1
13 - 72	Values assigned to the second 30 statements of Q-sort
73 - 80	Responses to the eight questions on the Lynn Achievement Questionnaire: 1 - Yes 2 - No 3 - No Response

COPY OF COMPUTER PRINTOUT

NAME	MEAN	STANDARD DEV	C-200
W00001	2.7734	2.7947	274
W00002	2.7734	2.7947	274
W00003	2.7734	2.7947	274
W00004	2.7734	2.7947	274
W00005	2.7734	2.7947	274
W00006	2.7734	2.7947	274
W00007	2.7734	2.7947	274
W00008	2.7734	2.7947	274
W00009	2.7734	2.7947	274
W00010	2.7734	2.7947	274
W00011	2.7734	2.7947	274
W00012	2.7734	2.7947	274
W00013	2.7734	2.7947	274
W00014	2.7734	2.7947	274
W00015	2.7734	2.7947	274
W00016	2.7734	2.7947	274
W00017	2.7734	2.7947	274
W00018	2.7734	2.7947	274
W00019	2.7734	2.7947	274
W00020	2.7734	2.7947	274
W00021	2.7734	2.7947	274
W00022	2.7734	2.7947	274
W00023	2.7734	2.7947	274
W00024	2.7734	2.7947	274
W00025	2.7734	2.7947	274
W00026	2.7734	2.7947	274
W00027	2.7734	2.7947	274
W00028	2.7734	2.7947	274
W00029	2.7734	2.7947	274
W00030	2.7734	2.7947	274
W00031	2.7734	2.7947	274
W00032	2.7734	2.7947	274
W00033	2.7734	2.7947	274
W00034	2.7734	2.7947	274
W00035	2.7734	2.7947	274
W00036	2.7734	2.7947	274
W00037	2.7734	2.7947	274
W00038	2.7734	2.7947	274
W00039	2.7734	2.7947	274
W00040	2.7734	2.7947	274
W00041	2.7734	2.7947	274
W00042	2.7734	2.7947	274
W00043	2.7734	2.7947	274
W00044	2.7734	2.7947	274
W00045	2.7734	2.7947	274
W00046	2.7734	2.7947	274
W00047	2.7734	2.7947	274
W00048	2.7734	2.7947	274
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W00058	2.7734	2.7947	274
W00059	2.7734	2.7947	274
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W00062	2.7734	2.7947	274
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W00064	2.7734	2.7947	274
W00065	2.7734	2.7947	274
W00066	2.7734	2.7947	274
W00067	2.7734	2.7947	274
W00068	2.7734	2.7947	274
W00069	2.7734	2.7947	274
W00070	2.7734	2.7947	274
W00071	2.7734	2.7947	274
W00072	2.7734	2.7947	274
W00073	2.7734	2.7947	274
W00074	2.7734	2.7947	274
W00075	2.7734	2.7947	274
W00076	2.7734	2.7947	274
W00077	2.7734	2.7947	274
W00078	2.7734	2.7947	274
W00079	2.7734	2.7947	274
W00080	2.7734	2.7947	274
W00081	2.7734	2.7947	274
W00082	2.7734	2.7947	274
W00083	2.7734	2.7947	274
W00084	2.7734	2.7947	274
W00085	2.7734	2.7947	274
W00086	2.7734	2.7947	274
W00087	2.7734	2.7947	274
W00088	2.7734	2.7947	274
W00089	2.7734	2.7947	274
W00090	2.7734	2.7947	274
W00091	2.7734	2.7947	274
W00092	2.7734	2.7947	274
W00093	2.7734	2.7947	274
W00094	2.7734	2.7947	274
W00095	2.7734	2.7947	274
W00096	2.7734	2.7947	274
W00097	2.7734	2.7947	274
W00098	2.7734	2.7947	274
W00099	2.7734	2.7947	274
W00100	2.7734	2.7947	274

APPENDIX D

COPY OF COMPUTER PRINTOUT

VARIABLE	MEAN	STANDARD DEV	CASES
VAR001	4.8036	2.5947	224
VAR002	4.7321	1.8533	224
VAR003	5.9598	2.0582	224
VAR004	4.6384	2.2785	224
VAR005	3.7321	1.9338	224
VAR006	7.5893	1.8485	224
VAR007	6.7946	1.8485	224
VAR008	5.6786	1.8325	224
VAR009	5.3750	1.6245	224
VAR010	5.6830	2.0990	224
VAR011	5.0223	2.2016	224
VAR012	6.0045	2.5243	224
VAR013	4.4064	2.5157	224
VAR014	5.0179	1.8557	224
VAR015	5.0357	1.7069	224
VAR016	6.5670	1.5108	224
VAR017	3.6161	1.9281	224
VAR018	6.1741	2.2711	224
VAR019	2.7098	1.7995	224
VAR020	3.0937	1.8522	224
VAR021	6.0580	1.7285	224
VAR022	4.2902	2.0965	224
VAR023	5.4866	2.2169	224
VAR024	4.7098	1.6432	224
VAR025	4.4152	1.4738	224
VAR026	3.5134	2.3139	224
VAR027	4.2902	2.2211	224
VAR028	5.6920	1.9008	224
VAR029	3.1473	1.6703	224
VAR030	5.4955	1.9684	224
VAR031	4.5625	2.1357	224
VAR032	1.5089	1.4762	224
VAR033	4.1116	2.2333	224
VAR034	6.7455	1.7262	224
VAR035	5.6518	2.5943	224
VAR036	5.4062	2.9601	224
VAR037	5.5080	4.0357	224
VAR038	5.1424	5.2768	224
VAR039	5.8973	3.5274	224
VAR040	3.5893	1.7720	224
VAR041	3.3884	2.3516	224
VAR042	5.5402	1.9838	224
VAR043	6.3348	1.8557	224
VAR044	6.7723	1.8502	224
VAR045	6.4152	1.7130	224
VAR046	4.9375	2.1896	224
VAR047	3.9554	1.9053	224
VAR048	6.9866	2.3380	224
VAR049	2.5268	1.9267	224
VAR050	4.0759	2.0484	224
VAR051	5.2143	1.9929	224
VAR052	6.0580	1.7846	224
VAR053	4.6741	1.9607	224
VAR054	5.1562	2.0107	224
VAR055	1.7812	1.5680	224
VAR056	3.7634	2.8775	224
VAR057	7.2069	1.5987	224
VAR058	5.3618	2.3711	224
VAR059	6.6452	2.1158	224
VAR060	6.6250	1.7875	224

COPY OF COMPUTER PRINTOUT (Continued)

FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
1	4.68329	7.8	7.8
2	4.05107	6.8	14.6
3	2.93730	4.9	19.5
4	2.67350	4.5	23.9
5	2.29212	3.8	27.7
6	2.17204	3.6	31.3
7	2.04195	3.4	34.8
8	1.73889	2.9	37.7
9	1.70134	2.8	40.5
10	1.63737	2.7	43.2
11	1.47921	2.5	45.7
12	1.43482	2.4	48.1
13	1.33540	2.2	50.3
14	1.27583	2.1	52.4
15	1.22635	2.0	54.5
16	1.19251	2.0	56.5
17	1.17224	2.0	58.4
18	1.16558	1.9	60.4
19	1.12949	1.9	62.2
20	1.06187	1.8	64.0
21	1.03088	1.7	65.7
22	0.98841	1.6	67.4
23	0.97478	1.6	69.0
24	0.91743	1.5	70.5
25	0.87136	1.5	72.0
26	0.85721	1.4	73.4
27	0.85528	1.4	74.8
28	0.84937	1.4	76.2
29	0.82216	1.4	77.6
30	0.77298	1.3	78.9
31	0.73711	1.2	80.1
32	0.72375	1.2	81.3
33	0.68067	1.1	82.5
34	0.66218	1.1	83.6
35	0.62856	1.0	84.6
36	0.60488	1.0	85.6
37	0.57945	1.0	86.6
38	0.56061	0.9	87.5
39	0.53756	0.9	88.4
40	0.51727	0.9	89.3
41	0.50627	0.8	90.1
42	0.47379	0.8	90.9
43	0.47238	0.8	91.7
44	0.44725	0.7	92.5
45	0.42862	0.7	93.2
46	0.39116	0.7	93.8
47	0.38224	0.6	94.5
48	0.37064	0.6	95.1
49	0.35366	0.6	95.7
50	0.33820	0.6	96.2
51	0.32326	0.5	96.8
52	0.31113	0.5	97.3
53	0.29832	0.5	97.8
54	0.28234	0.5	98.3
55	0.25657	0.4	98.7
56	0.21634	0.4	99.0
57	0.20469	0.3	99.4
58	0.20103	0.3	99.7
59	0.12532	0.2	99.9
60	0.04121	0.1	100.0

COPY OF COMPUTER PRINTOUT (Continued)

VARIABLE	COMMUNALITY
VAR001	0.61012
VAR002	0.65131
VAR003	0.66234
VAR004	0.67125
VAR005	0.63970
VAR006	0.70396
VAR007	0.73646
VAR008	0.59951
VAR009	0.65957
VAR010	0.53781
VAR011	0.69485
VAR012	0.63051
VAR013	0.66225
VAR014	0.72975
VAR015	0.54771
VAR016	0.65520
VAR017	0.55252
VAR018	0.68482
VAR019	0.61592
VAR020	0.64522
VAR021	0.66768
VAR022	0.77468
VAR023	0.71065
VAR024	0.67421
VAR025	0.52850
VAR026	0.73120
VAR027	0.66548
VAR028	0.62846
VAR029	0.59552
VAR030	0.62841
VAR031	0.70219
VAR032	0.75008
VAR033	0.59627
VAR034	0.71563
VAR035	0.61773
VAR036	0.73384
VAR037	0.77032
VAR038	0.85763
VAR039	0.58836
VAR040	0.62137
VAR041	0.72392
VAR042	0.65839
VAR043	0.69729
VAR044	0.69252
VAR045	0.67753
VAR046	0.66602
VAR047	0.63276
VAR048	0.68146
VAR049	0.53118
VAR050	0.61942
VAR051	0.64653
VAR052	0.57602
VAR053	0.58240
VAR054	0.73191
VAR055	0.56061
VAR056	0.69614
VAR057	0.66707
VAR058	0.60705
VAR059	0.69066
VAR060	0.64339

COPY OF COMPUTER PRINTOUT (Continued)

VARIJAX ROTATED FACTOR MATRIX

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 6	FACTOR 7
VAR001	0.56718	0.15831	0.02640	0.07441	0.00015	-0.10107	0.08226
VAR002	0.05473	0.08491	-0.12252	-0.20689	-0.14919	-0.17908	0.03194
VAR003	-0.44895	-0.15591	-0.04886	0.09694	0.15895	0.11009	-0.03290
VAR004	-0.04016	0.07818	-0.18370	-0.01190	0.09516	0.08002	0.00069
VAR005	0.10741	0.02921	0.07894	-0.06148	-0.07654	0.17492	-0.00850
VAR006	-0.01055	-0.04410	0.05962	0.02605	-0.04919	0.07323	0.08677
VAR007	0.21449	-0.21968	-0.05231	0.04143	0.04720	-0.21147	0.00725
VAR008	-0.07835	-0.03714	0.19149	0.08707	0.01605	-0.02073	0.12000
VAR009	0.14753	-0.04564	-0.14850	-0.01203	-0.04686	0.27578	0.08803
VAR010	-0.25079	0.00182	0.44888	-0.01008	-0.03232	0.04666	0.15502
VAR011	0.02827	-0.11642	0.01341	-0.07675	0.02708	-0.04413	-0.00351
VAR012	-0.25184	0.15867	-0.03358	0.07707	-0.07800	-0.05155	-0.05695
VAR013	-0.10240	0.67679	-0.06004	-0.12724	0.04172	0.03049	0.09664
VAR014	-0.06092	0.14793	0.14622	0.11153	0.04429	0.04627	0.11758
VAR015	0.08682	-0.23690	-0.34106	-0.06598	-0.00315	-0.01378	-0.02746
VAR016	-0.10993	-0.18697	0.24994	0.11518	0.03476	0.09698	0.23732
VAR017	0.09314	-0.10666	-0.11134	0.11047	-0.05645	-0.14826	-0.03649
VAR018	-0.03641	0.17494	0.00991	0.08747	0.08857	-0.11980	-0.12698
VAR019	0.00178	0.03664	-0.00246	-0.14110	0.01242	0.24475	-0.44371
VAR020	0.25876	0.09023	0.02607	0.50330	-0.04431	0.02623	-0.20176
VAR021	-0.15978	-0.06130	0.07550	-0.03593	0.05650	0.00920	0.03035
VAR022	0.04312	-0.07294	-0.03734	-0.08738	0.14551	-0.06205	0.01886
VAR023	-0.74549	0.00568	0.03721	0.09857	0.12060	0.10975	-0.00686
VAR024	0.31273	0.09715	-0.10524	-0.50376	0.04665	0.22429	0.00889
VAR025	0.25450	-0.05529	-0.14909	0.09067	-0.34186	0.06638	0.15355
VAR026	0.01389	-0.03844	0.07050	-0.01427	-0.01236	-0.01043	0.08472
VAR027	0.16646	0.04255	-0.13009	-0.07158	-0.01953	-0.07734	-0.04445
VAR028	0.15558	-0.30880	0.26147	0.11596	-0.13965	0.16305	0.08548
VAR029	0.21942	0.41549	-0.30181	0.13375	-0.01225	-0.07968	-0.10121
VAR030	0.13975	0.01097	-0.15276	0.49768	0.05467	0.14614	0.15635

COPY OF COMPUTER PRINTOUT (Continued)

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 6	FACTOR 7
VAR031	-0.00329	-0.73554	-0.04303	-0.10823	-0.06748	-0.14293	-0.04293
VAR032	0.08308	0.14059	0.00996	-0.03955	0.00509	0.79329	-0.07276
VAR033	0.24895	-0.22828	-0.26362	-0.09815	-0.07503	-0.01010	0.07150
VAR034	0.12820	0.07759	0.02711	-0.06090	0.02273	-0.04389	0.74893
VAR035	0.22528	-0.14100	-0.19945	0.15659	-0.21245	-0.20274	-0.00957
VAR036	-0.30802	0.21228	-0.06985	0.08741	0.66949	-0.03574	0.02139
VAR037	-0.04132	-0.02028	-0.04040	-0.04579	0.83165	-0.00577	-0.00469
VAR038	-0.01147	0.02430	0.02504	0.01646	0.89250	-0.01744	0.06095
VAR039	0.19231	-0.27382	0.04848	0.24724	0.20329	-0.12737	-0.01873
VAR040	0.04767	-0.06982	-0.07882	0.10243	-0.00456	-0.03209	-0.12683
VAR041	0.03099	-0.04498	0.04209	-0.01465	0.03024	0.03072	-0.79537
VAR042	-0.18240	-0.26343	0.11329	0.01584	-0.12507	0.01397	-0.00084
VAR043	0.16546	-0.28720	-0.21473	0.14051	0.04914	0.09835	0.04649
VAR044	0.00397	-0.11350	-0.12943	0.01810	-0.03190	-0.13177	-0.04567
VAR045	-0.07842	-0.03836	0.77403	-0.02275	-0.02543	0.02887	-0.03348
VAR046	0.13618	-0.00718	-0.08550	-0.01770	-0.04771	-0.03391	-0.08169
VAR047	0.14779	0.13280	-0.02168	0.02017	-0.04264	-0.00439	-0.13127
VAR048	0.11848	0.06892	0.01648	0.03852	-0.03311	-0.11579	0.03328
VAR049	0.16507	0.37632	0.35627	0.24850	0.04912	-0.07721	0.06847
VAR050	0.12923	0.39906	-0.00965	-0.04597	-0.02674	0.11725	-0.00044
VAR051	0.19898	0.00418	0.01277	-0.04553	-0.01173	-0.29101	-0.09038
VAR052	-0.61862	0.03418	0.17702	0.03846	0.11919	-0.14539	-0.02452
VAR053	0.23131	0.39740	-0.09398	-0.01825	-0.01045	0.10939	-0.06628
VAR054	0.00280	0.20322	0.07275	-0.04771	-0.01744	-0.12366	0.02347
VAR055	0.05079	0.13439	-0.01873	0.11322	-0.11327	0.57617	-0.07871
VAR056	0.03214	0.10104	-0.15936	0.07300	0.00961	0.10455	0.08874
VAR057	0.15191	-0.06674	-0.08473	-0.12814	-0.0562	0.06377	0.19052
VAR058	-0.08421	-0.53975	-0.06589	-0.12974	-0.02995	-0.25754	-0.02631
VAR059	-0.73307	-0.02736	0.01438	-0.02243	0.07528	-0.18034	0.01339
VAR060	-0.09039	0.16401	0.02005	0.02330	-0.01596	-0.11479	0.01533

COPY OF COMPUTER PRINTOUT (Continued)

	FACTOR 8	FACTOR 9	FACTOR 10	FACTOR 11	FACTOR 12	FACTOR 13	FACTOR 14
VAR001	0.02893	-0.29077	0.13933	0.09766	0.02440	-0.14722	-0.04050
VAR002	0.08410	0.22255	0.11603	0.01730	0.16836	0.10034	0.05825
VAR003	-0.19516	0.31695	-0.08248	0.04933	-0.06287	-0.04747	0.05506
VAR004	0.02071	0.06145	-0.14040	0.04834	0.07180	0.04088	-0.04197
VAR005	0.03164	-0.06990	-0.07650	0.08552	-0.02425	-0.03126	0.16799
VAR006	0.72065	0.01958	-0.04448	0.00207	0.07834	-0.03223	-0.02764
VAR007	-0.00024	0.01118	-0.02805	0.16456	0.07466	0.06494	0.03588
VAR008	0.15042	0.19910	-0.03217	-0.06972	-0.01378	0.01328	-0.03224
VAR009	-0.03173	0.01734	-0.06673	0.06039	0.53614	0.23381	0.12720
VAR010	0.02515	0.22029	-0.01418	0.21924	0.14592	0.09680	0.10018
VAR011	-0.02879	0.07776	-0.01087	-0.16677	-0.05417	0.05442	0.07993
VAR012	-0.02328	0.15829	0.18770	0.06815	-0.04931	-0.02643	0.14234
VAR013	-0.03727	-0.15040	0.05635	-0.07088	-0.14368	-0.14088	-0.00349
VAR014	0.12625	0.05831	-0.12790	-0.12115	0.66818	-0.00957	-0.25453
VAR015	0.06119	0.05154	0.15389	0.27306	0.15558	-0.24515	0.24503
VAR016	-0.22879	-0.04283	-0.11660	0.08468	-0.04463	-0.14927	0.10539
VAR017	0.38649	-0.28474	-0.08879	0.06916	0.24549	-0.27023	-0.10190
VAR018	-0.24083	0.01123	0.28140	0.28640	0.08145	-0.13209	-0.13373
VAR019	-0.05968	0.03586	0.23371	-0.01522	-0.00523	0.43308	0.00635
VAR020	-0.17213	-0.01792	-0.03179	0.01625	-0.01514	0.12680	0.23375
VAR021	0.08999	-0.03377	0.12833	0.05475	0.01799	0.75835	0.04591
VAR022	0.11358	-0.00340	0.05733	-0.00864	0.04749	-0.00348	0.04882
VAR023	-0.01602	-0.10572	0.10339	0.16067	-0.03934	0.02148	0.09977
VAR024	0.04034	0.22424	-0.08743	0.25824	-0.04430	-0.04847	-0.14403
VAR025	-0.01049	0.23216	0.02339	0.36884	0.12865	0.09036	-0.03560
VAR026	-0.06124	0.01248	0.00374	0.04401	-0.07113	0.01417	0.3455
VAR027	0.01342	-0.01937	-0.01494	-0.05720	-0.05051	-0.07350	-0.11737
VAR028	-0.03516	0.07504	0.04368	0.33571	-0.16027	-0.00297	-0.26424
VAR029	-0.02327	0.08243	0.08800	-0.03562	-0.07225	0.11110	-0.18504
VAR030	0.32178	0.20008	-0.13648	-0.00297	-0.03289	-0.07023	-0.20843

COPY OF COMPUTER PRINTOUT (Continued)

	FACTOR 8	FACTOR 9	FACTOR 10	FACTOR 11	FACTOR 12	FACTOR 13	FACTOR 14
VAR031	-0.10906	0.03475	0.17707	-0.12830	-0.07777	0.01163	-0.00304
VAR032	0.03600	0.07928	-0.05551	-0.06410	0.07424	0.13703	0.00190
VAR033	-0.12802	-0.04139	-0.07656	0.25292	-0.19644	-0.01891	-0.10695
VAR034	-0.02609	-0.73115	0.06296	-0.19525	0.06018	-0.01202	-0.01281
VAR035	0.75367	-0.03266	-0.00911	0.01065	-0.09440	-0.01336	-0.32851
VAR036	-0.04130	-0.02707	0.13403	0.00077	-0.04315	0.07546	-0.01212
VAR037	-0.00267	-0.10261	-0.03215	-0.05019	-0.01116	0.01626	-0.01506
VAR038	-0.00283	0.09320	0.03886	0.07979	0.08845	0.02715	-0.01670
VAR039	-0.06375	0.12335	-0.02877	0.27030	0.07776	-0.01109	-0.03770
VAR040	0.12154	-0.04532	-0.09814	-0.19365	-0.08164	-0.12400	-0.13583
VAR041	0.03236	0.01010	-0.79084	-0.03042	-0.01187	-0.05958	-0.07387
VAR042	-0.06343	-0.11101	0.05048	0.16873	0.06768	-0.04493	0.18364
VAR043	-0.00643	-0.73559	-0.05479	-0.37014	-0.15486	0.12333	0.08604
VAR044	0.03528	-0.00421	-0.04290	-0.07792	-0.02572	0.03384	0.07634
VAR045	-0.10630	0.10958	0.04290	0.06449	0.02717	0.04364	0.07211
VAR046	0.00324	0.09980	0.09208	-0.01889	-0.00914	0.01224	-0.05129
VAR047	0.00716	0.17653	0.08489	-0.00964	-0.10200	-0.03955	0.02369
VAR048	-0.10438	0.07477	0.13789	-0.01021	0.03158	0.07201	-0.05595
VAR049	0.00990	0.02336	0.19282	0.14385	-0.04454	-0.04401	-0.16229
VAR050	0.01517	-0.03547	-0.12582	-0.07106	-0.47207	0.15842	-0.07050
VAR051	-0.11224	0.01552	0.05465	-0.07672	0.37800	0.01602	-0.05864
VAR052	-0.14793	0.03974	0.04035	-0.00038	-0.15462	0.03333	-0.02606
VAR053	0.12132	0.00749	0.04103	-0.04886	-0.02364	0.05666	-0.06891
VAR054	-0.03718	0.04333	-0.18751	-0.02604	0.05627	-0.13084	0.00296
VAR055	-0.05353	0.04006	0.13961	0.01511	0.00432	-0.34919	-0.02249
VAR056	-0.30227	-0.04928	0.23366	-0.08437	0.02302	0.04506	0.00017
VAR057	-0.16907	0.12686	0.11205	-0.71264	0.07544	-0.06360	-0.13330
VAR058	-0.19834	-0.04856	0.03780	-0.00193	-0.14616	0.05537	0.02426
VAR059	-0.09546	0.34848	0.04921	-0.03223	-0.16182	0.12541	-0.09827
VAR060	-0.00012	0.18957	-0.25571	-0.16950	-0.03620	-0.04932	-0.03550

COPY OF COMPUTER PRINTOUT (Continued)

	FACTOR 15	FACTOR 16	FACTOR 17	FACTOR 18	FACTOR 19	FACTOR 20	FACTOR 21
VAR001	-0.16176	0.03743	0.03199	-0.03983	-0.11073	-0.15571	0.05629
VAR002	0.18271	0.06995	-0.00776	0.01170	-0.10873	0.09639	-0.19389
VAR003	-0.04648	0.00636	0.02114	0.03013	-0.00598	-0.01762	-0.12428
VAR004	0.07099	0.11695	-0.14039	-0.06196	0.01539	0.00142	0.12034
VAR005	-0.18316	-0.02207	-0.04460	-0.18882	-0.03663	-0.11618	-0.12322
VAR006	-0.12831	0.37703	-0.00084	-0.09432	-0.11119	-0.11543	-0.09621
VAR007	-0.01028	0.02828	0.04182	0.05053	0.05348	0.00282	0.03824
VAR008	-0.02399	0.08543	0.14903	0.05521	0.00834	-0.00590	-0.03378
VAR009	-0.02243	0.06373	-0.09254	0.01325	-0.01806	-0.03143	-0.09770
VAR010	0.28577	0.35011	0.23024	0.00123	0.01392	0.02602	0.01626
VAR011	0.05378	0.07064	0.08069	0.08741	0.01120	0.19979	-0.09505
VAR012	-0.00369	-0.06859	-0.06935	0.19956	0.41776	-0.03045	-0.02209
VAR013	-0.11803	-0.28950	-0.02470	0.01078	-0.02119	-0.05295	0.17763
VAR014	-0.02843	0.03399	0.06355	0.08241	0.01103	0.04995	-0.15045
VAR015	0.05980	0.01957	-0.05182	-0.07293	0.04987	0.03428	0.11008
VAR016	0.16293	0.04917	-0.02176	-0.10151	0.15143	0.20748	0.16894
VAR017	0.16611	0.11092	0.09256	-0.62380	-0.07939	0.01647	0.11166
VAR018	0.08565	0.00488	0.12126	-0.02178	-0.07987	0.00319	-0.02728
VAR019	-0.01604	0.04156	0.21102	0.52457	-0.11664	-0.02962	0.01312
VAR020	-0.23577	0.07984	-0.21570	-0.00588	0.13063	-0.03580	0.11854
VAR021	-0.12624	-0.16226	0.72809	0.01247	0.05393	-0.04485	0.03065
VAR022	-0.06197	0.11660	-0.05214	0.12815	-0.05452	0.02364	-0.03045
VAR023	0.05747	0.11316	-0.09907	0.03505	-0.07533	0.01564	0.08491
VAR024	0.02110	-0.03168	0.08841	0.10360	-0.06356	0.01927	0.15945
VAR025	-0.00558	0.08135	0.02898	0.23477	0.06010	0.00016	0.01524
VAR026	-0.06549	0.05161	-0.02802	0.02611	0.04650	-0.04622	-0.03368
VAR027	-0.08509	-0.04514	0.19464	-0.21133	0.04557	-0.14270	0.21277
VAR028	-0.01163	0.02573	0.03698	-0.18811	0.05614	-0.09391	0.07477
VAR029	-0.10674	0.08266	-0.08176	0.21450	0.08624	0.05024	0.02384
VAR030	-0.32092	-0.01783	-0.19861	0.02238	0.32083	-0.24862	-0.00779

COPY OF COMPUTER PRINTOUT (Continued)

	FACTOR 15	FACTOR 16	FACTOR 17	FACTOR 18	FACTOR 19	FACTOR 20	FACTOR 21
VAR031	0.05926	0.04216	0.00884	-0.03644	-0.07846	0.01877	-0.06721
VAR032	0.03378	-0.14994	0.01287	0.00285	0.00946	0.06226	0.01932
VAR033	0.01711	0.11808	-0.04756	-0.09217	0.00583	-0.14293	-0.02633
VAR034	0.04033	0.02796	0.10091	-0.09188	-0.02539	0.00004	-0.14089
VAR035	-0.03848	0.02307	0.02831	0.16139	-0.07317	0.22872	0.07900
VAR036	-0.00430	0.11321	0.01823	-0.00775	-0.07204	-0.14488	0.02442
VAR037	0.00382	0.00349	-0.14019	0.00626	0.12404	-0.05078	-0.10349
VAR038	0.05376	0.10281	-0.22022	-0.07833	-0.11224	-0.13694	-0.05036
VAR039	-0.25558	0.24330	-0.08625	-0.20037	0.25116	0.36624	0.00082
VAR040	0.08485	-0.06020	0.36787	0.20520	0.11283	0.11387	-0.02660
VAR041	-0.05676	-0.07167	0.16399	0.08461	0.14643	-0.01946	-0.09064
VAR042	0.53770	-0.14160	0.09723	-0.18778	-0.02050	-0.02733	-0.03451
VAR043	-0.00871	-0.07819	-0.15931	-0.26098	0.00287	0.21463	0.27611
VAR044	-0.05423	-0.22123	-0.24208	-0.18312	-0.04814	0.04858	0.07826
VAR045	-0.00312	-0.07646	-0.04555	0.01796	0.01407	0.69016	0.02101
VAR046	0.08833	0.09632	0.23616	0.15810	0.22018	-0.02799	0.04423
VAR047	-0.07253	0.17840	-0.06915	-0.16804	0.18789	0.04494	-0.01219
VAR048	0.13900	-0.05130	0.02188	0.09340	-0.02051	0.03999	-0.02119
VAR049	-0.04128	-0.24620	-0.04066	0.10903	0.01228	-0.03771	-0.02425
VAR050	-0.02600	-0.10161	-0.05223	0.14625	-0.05817	0.03272	-0.19008
VAR051	-0.20281	-0.03533	-0.08707	-0.01943	-0.09969	0.01748	0.33966
VAR052	-0.10788	-0.00967	0.11425	0.14234	0.18008	-0.05080	-0.04187
VAR053	-0.06578	0.50873	0.05387	-0.08878	0.14430	-0.15937	0.01079
VAR054	-0.07741	-0.01645	0.16196	-0.15501	-0.17830	0.09276	0.03751
VAR055	-0.10463	-0.32603	-0.09744	-0.11202	0.03375	-0.11216	0.07599
VAR056	0.03215	0.08234	-0.10976	0.07712	-0.13359	0.01948	-0.03074
VAR057	-0.01094	0.34540	0.05712	0.02833	-0.07464	0.11707	0.00744
VAR058	-0.06841	-0.07338	0.01826	-0.07148	-0.03593	0.07259	0.20524
VAR059	-0.12576	-0.04965	-0.05300	-0.01838	0.02138	0.03609	-0.05262
VAR060	-0.11539	-0.14294	-0.11764	-0.04506	0.01360	0.02862	-0.04009