



The effect of racquetball and rhythmic fitness on the self-concept of college women
by Olena Kay Plummer

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Education
Montana State University

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Abstract:

The purpose of this study was to examine the effects of one semester of rhythmic aerobics or racquetball on the self-concepts of college women. In the pretest-posttest designed study 254 women completed the study; racquetball 39, rhythmic fitness 124, and control 111. The Tennessee Self-Concept Scale was used to measure self-concept. An information form was completed by each subject at the pretest and post-test. The statistical methods used were analysis of variance and analysis of covariance. Significant differences were found between the rhythmic aerobics group and the control group in the areas of physical-self and self-satisfaction. Significant differences were found between the rhythmic aerobics and racquetball group in the areas of personal-self, family-self, behavior and Total Positive score. The rhythmic aerobic group had improved self-concept scores on the subscales.

No significant differences were found between subjects that exercised more than twice a week and those who exercised twice or less. Problems with the exercise questions on the information forms make interpretation of the exercise results difficult.

No significant differences were found at posttest between subjects that had taken rhythmic aerobics before the semester began and those that had not taken rhythmic aerobics before. The conclusion was drawn that the gains in self-concept attributed to rhythmic aerobics were temporary.

There were significant differences in the racquetball group at posttest between those subjects who had taken racquetball previously and those who had not taken racquetball before. The beginning racquetball subjects were more critical of themselves at the end of the semester.

Based on the review of literature and the results of this study, the researcher concluded that rhythmic aerobics is a positive self-concept activity for college women. Although generalizing to other groups should not be made carelessly, it appears that rhythmic aerobics is a positive recreational activity for women. Further study was suggested for both rhythmic aerobics and racquetball. No conclusions were drawn concerning the racquetball subjects until further research could be done and comparisons are made to male subjects.

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OF COLLEGE WOMEN

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A dissertation submitted in partial fulfillment
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This paper has been read by each member of the thesis committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

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12/6/85

I would like to dedicate this dissertation to my parents Olen and Leona Plummer. Their belief in the importance of education has guided me here.

This dissertation is also dedicated to my nieces: Brooke, Kelly, Sarah, Darcey and Jessica. When my days were dark and gloomy they brought me the sun.

TABLE OF CONTENTS

	Page
LIST OF TABLES.....	vi
ABSTRACT.....	viii
1. INTRODUCTION AND STATEMENT OF THE PROBLEM.....	1
2. REVIEW OF LITERATURE.....	13
3. METHODS AND PROCEDURES.....	43
4. RESULTS.....	55
5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS.....	84
LITERATURE CITED.....	92
APPENDICES.....	100

LIST OF TABLES

	Page
1. Summary of Racquetball Studies.....	42
2. Summary of Rhythmic Aerobic Studies.....	42
3. Control Group Membership.....	46
4. Experimental - Rhythmic Aerobics Group Membership.....	46
5. Experimental - Racquetball Group Membership.....	47
6. Oneway ANOVA Pretest Scores for Racquetball, Rhythmic Aerobics and Control.....	57
7. Oneway ANCOVA of Racquetball, Rhythmic Aerobics and Control Scores.....	59
8. Oneway ANCOVA of Low and High Self-concept Subjects.....	61
9. Oneway ANCOVA of Rhythmic Aerobics Instructors.....	64
10. Oneway ANCOVA Column Scores of Control Instructors.....	65
11. Oneway ANCOVA Row and Total Scores of Control Instructors..	66
12. Oneway ANCOVA of Low or High Exercisers in the Rhythmic Aerobics Group.....	69
13. Oneway ANCOVA of Nonexercisers and Regular Exercisers in the Control Group.....	70
14. Oneway ANOVA of Pretest Scores of Dropouts and Nondropouts.	72
15. Oneway ANOVA of Gain Scores for Racquetball, Rhythmic Aerobics and Control.....	74
16. Oneway ANCOVA of Racquetball Subjects with No Previous Experience and Those with Previous Experience in Racquetball.....	76
17. Oneway ANCOVA of Rhythmic Aerobics Subjects with No Previous Experience and Those with Previous Experience in Rhythmic Aerobics.....	79

LIST OF TABLES (Continued)

	Page
18. Oneway ANCOVA of Control Subjects with No Previous Experience in Racquetball or Rhythmic Aerobics and Those with Previous Experience.....	80

ABSTRACT

The purpose of this study was to examine the effects of one semester of rhythmic aerobics or racquetball on the self-concepts of college women. In the pretest-posttest designed study 254 women completed the study; racquetball 39, rhythmic fitness 124, and control 111. The Tennessee Self-Concept Scale was used to measure self-concept. An information form was completed by each subject at the pretest and post-test. The statistical methods used were analysis of variance and analysis of covariance. Significant differences were found between the rhythmic aerobics group and the control group in the areas of physical-self and self-satisfaction. Significant differences were found between the rhythmic aerobics and racquetball group in the areas of personal-self, family-self, behavior and Total Positive score. The rhythmic aerobic group had improved self-concept scores on the subscales.

No significant differences were found between subjects that exercised more than twice a week and those who exercised twice or less. Problems with the exercise questions on the information forms make interpretation of the exercise results difficult.

No significant differences were found at posttest between subjects that had taken rhythmic aerobics before the semester began and those that had not taken rhythmic aerobics before. The conclusion was drawn that the gains in self-concept attributed to rhythmic aerobics were temporary.

There were significant differences in the racquetball group at posttest between those subjects who had taken racquetball previously and those who had not taken racquetball before. The beginning racquetball subjects were more critical of themselves at the end of the semester.

Based on the review of literature and the results of this study, the researcher concluded that rhythmic aerobics is a positive self-concept activity for college women. Although generalizing to other groups should not be made carelessly, it appears that rhythmic aerobics is a positive recreational activity for women. Further study was suggested for both rhythmic aerobics and racquetball. No conclusions were drawn concerning the racquetball subjects until further research could be done and comparisons are made to male subjects.

CHAPTER I

INTRODUCTION AND STATEMENT OF THE PROBLEM

Introduction

Norbeck (1979) suggests man is the animal that plays the most. He plays from birth to death, devoting large portions of his life to various games and activities. According to Lee (1983), ancient records dating back as far as 3200 B.C. indicate that man has always been a player and that he has continued to participate in many of the same activities that are recorded in sculpture and bas-reliefs found in museums throughout the world. Norbeck (1979) reports that the question, why man plays and participates in vigorous activity, has been studied by a variety of disciplines including anthropology, biology, medicine, physical education, psychology, and sociology. The complete answer as to why man plays is yet unknown, however it appears the Ancient Greeks with their limited knowledge of anatomy, physiology, and psychology were more enlightened than modern man has been. Three thousand years ago the Greeks and Romans advocated "Mens Sana in Corpore Sano" --- a sound mind in a sound body. Training of the whole individual was the goal of education at the time.

With the emphasis given to holistic medicine during the last decade, it is only appropriate that the Greeks' holistic approach to the human being should once again be at the forefront of education.

Numerous studies have been conducted trying to establish the exact relationship between mind and body, all with varying degrees of success.

Physical educators have claimed for years that there are many psychological benefits derived from participation in physical education programs. Unfortunately physical education encompasses such a variety of activities that documentation is difficult. It appears that to better study the psychological effects of physical education one must attempt to define which psychological effect is to be studied and what is meant by physical education activities.

This study dealt with the two most popular physical education classes offered at the University of Nevada, Reno (UNR) racquetball and rhythmic aerobics. Rhythmic aerobics is the name the UNR physical education department has chosen for fitness classes with music as an integral component of the workout. Many other names are used for similar programs at other institutions. In the fall of 1984 UNR offered 21 sections of racquetball. Enrollments ranged from 16-22 students per section. In rhythmic aerobics, ten sections, there were 25-55 students enrolled per section. The popularity of both of these physical education activities is not limited to UNR and may be verified by looking at most college physical education service class offerings.

Currently rhythmic aerobics attracts predominantly female participants. However, more males are enrolling every semester. In the fall semester of 1983 only 1 percent of rhythmic aerobics students were male; while in the spring of 1984, 5 percent of the enrollment was male. The number of male students enrolled in rhythmic aerobics during fall 1984 was 6.7 percent of the total enrollment. The study was, therefore,

limited to female UNR students as comparisons were made among the racquetball, rhythmic aerobics and control subjects.

Looking at the psychological factors mentioned most often in reference to physical education, self-actualization, self-esteem, and self-concept appear again and again. Slusher (1967, p. 81) in his book about man and sport states "The world of sports provides development within self as well as for self." Yet several studies have failed to find support for this contention, studies by Bruya (1977), Hughes (1973), Jacobs (1977), Jette (1975), and Millet (1974) to name a few. Support has been found in studies by Collingwood (1972), Teng (1982), Tucker (1982, 1983), Wilson (1982) and others. Nixon (1980, p 38) states "Many individuals in sport and dance are straining to meet self-esteem needs, as indicated by the way they drive themselves through intense practices and competitions." What of the individuals who engage in physical education activities on a limited basis? Are they meeting self-esteem needs? Are they becoming more self-actualized? Collingwood (1972), Shadow (1979), Shirfron (1982), Tucker (1982, 1983) and Wescott (1980) have attempted to address these questions. Although the results of these studies tend to indicate that self-concept is improved by participation in regular physical education activities, research problems make it difficult to draw accurate conclusions. The reader is left asking: Do physical education activities in a class setting affect self-concept? If so, does participation in a racquetball or a rhythmic aerobics class affect self-concept the most? These are some of the questions this study attempted to answer.

Statement of the Problem

The primary purpose of this study was to determine if a semester of selected elective physical education activity classes at the UNR would result in a significant change in the self-concept of female college students as measured by the Tennessee Self-Concept Scale (TSCS).

The study was conducted at the UNR during the fall semester of 1984.

Need for the Study

In recent years there has been considerable interest in the effect of physical activity on psychological health. Folkins and Sime (1981) examined 120 studies dealing with physical fitness and mental health while Browman (1981) in his reappraisal of physical activity as a therapy for psychopathology listed half that number.

The literature and results of many of the studies contradict each other. One study finds a positive effect of physical activity on self-concept while another finds no effect. This leaves the reader confused and uncertain as to the effect of physical activity on self-concept. Much confusion may be due to poor research methodology and a lack of uniformity in the measuring instruments used. However, Folkins and Sime (1981) have concluded that fitness training seems to help people cope with psychological stresses and tends to promote general well-being in the individual. Of all the psychological variables that have been studied in relation to physical fitness, Folkins and Sime found the self-concept studies to be most significant. The authors suggest that more studies of an experimental or of a quasi-experimental nature be done in this area. Studies by Collingwood (1972), Collingwood and

Willett (1971), Hilyer and Mitchell (1979), Martinek, Zaichkowsky and Cheffers (1977) and Tucker (1982, 1983) denote that self-esteem tends to improve significantly as a result of regular physical training although conflicting results were found by Bruya (1977), Hughes (1973), Jacobs (1977), Jette (1975), Millet (1974) and Mauser and Reynolds (1977).

Browman (1981) in his review of psychological and physical activity reappraisal, found that physical activity seems to be necessary for psychological health, however, more studies are needed in this area. Lowell Cooper (1969, p. 20) suggests "there is a need for research that separate out the personality traits which are characteristically related to physical activity...". Folkins and Sime (1981, p. 380), in their review of the literature of physical fitness training and mental health, found "personality research with the highest payoff has been that which focuses on self-concept variables." In accordance with the above researchers, Slusher (1967, p. 81) suggests "it should be evident that sport presents a diversified arena for worthy scholastic inquiry."

According to Jersild (1965), sport and physical fitness play an important role in the development of self-concept especially for males. Likewise, Hellison (1973) speculates that with the growth of the women's movement in the United States sport and physical activity will play a more important role in the development of women's self-esteem.

Rhythmic aerobic type activities have been studied in relation to self-concept with generally positive results. However, the results appear to be inconclusive due either to shortcomings in the research methodology or inadequate sample size. In Wilson's (1982) study the

control group consisted of students enrolling in aerobic dance for the first time. The experimental group was composed of students who had taken aerobic dance before. The self-concept instrument was a section of the Personnel Orientation Inventory, a test not found in other studies involving self-concept and physical activity. Shifron (1982) used a vocational self-concept instrument to study the relationship of rhythmic aerobics and vocational self-concept. Vocational self-concept is one aspect of self-concept.

Questions to be Answered

At the UNR there are two physical education activity classes that appeal to large numbers of students, 600 per semester. Why do so many students enroll in racquetball and rhythmic aerobics? Does it make them feel better about themselves? In informal discussion with students who are participating in these classes, it would seem that feeling good about themselves is one reason many enroll. Do the students really feel better about themselves after one semester of racquetball or rhythmic aerobics? Does their self-concept improve? These are some of the questions that needed to be answered.

More especially this investigation was conducted in an attempt to determine answers to the following specific questions:

1. Do female students enrolled in UNR college classes who do not exercise regularly experience a change in self-concept during one semester?
2. Do female students enrolled in UNR rhythmic aerobic physical education activity classes experience a change in self-concept during one semester?

3. Do female students enrolled in UNR racquetball physical education activity classes experience a change in self-concept during one semester?
4. Of the activity classes to be studied, will one have more effect on self-concept than the other?
5. Do female students who have enrolled in a particular activity class for the first time show more change in self-concept than those who have previously participated in a similar class?

General Procedures

During the fall semester of 1984 at the UNR the TSCS, a demographic questionnaire and a consent letter were given to each female student enrolled in racquetball and rhythmic aerobic activity classes.

During the second week of the semester, as the enrollment began to stabilize; the researcher, a research assistant, or the instructor of the class gave each female student a consent letter (Appendix A) that asked her to participate in the study. The student signified her agreement by signing and dating the letter. As the test administrator collected the letters, each student who signed the letter was given a demographic questionnaire (Appendix B) which was attached to a copy of the TSCS test manual and answer sheet. When these were completed the tester collected the questionnaire and the completed self-concept scale materials, placed them in a manila envelope and returned them to the researcher's mail box in the main physical education office.

The control group for this study consisted of the following classes: Biology 202, English 102, English 241, English 484, Home Economics 121, Recreation and Physical Education (RPED) 354, and Social

and Health Resources (SHR) 220. The classes were selected in the attempt to obtain a representative sample of students enrolled at the UNR during the fall semester of 1984. Cooperation of instructors and size of classes were major factors in the selection of the control classes. Two of the control classes originally selected for testing had to be changed one week before testing due to changes in teaching assignments. Biology 101, general biology, was replaced by Biology 202, plant biology and the students of the psychology testing pool were replaced by RPED 354 a general health class cross-listed with SHR.

The researcher tested all control classes using the same procedures as used in testing the racquetball and rhythmic aerobic classes.

During the fourteenth week of the fall semester those students who participated in the initial part of the study were given the TSCS and a second information form using the same procedures as the initial administration of the test, however, since they had already agreed to participate in the study, no consent letter was given.

Limitations

1. It was assumed that all experimental subjects in the study participated regularly in their physical education class since participation was a requirement for successful completion of the class.
2. It was assumed that all subjects responded honestly to both the demographic questionnaire and the TSCS.
3. It was assumed that the sample size was large enough for the results of the self-concept tests to reflect the effect of the

activity on the subjects more than the effect of the instructors.

Delimitations

The delimitations of the study were:

1. The use of female students at the UNR enrolled in selected physical education classes during the fall semester of 1984.
2. The use of female students enrolled in selected biology, English, home economics, RPED, and SHR classes.

Definition of Terms

Physical Education Activity Class

A one credit class offered by the Recreation, Physical Education and Dance department that meets in most instances for one hour twice a week. Participation in the activity is the main emphasis of the class.

Control Group

Those college students who will participate in the study who are not enrolled in racquetball or rhythmic aerobics classes.

Experimental Group

Those students who will have agreed to participate in the study and are enrolled in any of the selected activity classes.

Regular Exercise

Participation in sport or exercise at least twice per week.

Rhythmic Aerobics

A physical education class in which the main objectives are the teaching of physical fitness concepts and developing some aspect of physical fitness. The exercises are usually accompanied by music.

Racquetball Class

A physical education class whose main objectives are the teaching of specific racquetball skills and techniques associated with the sport.

Self-Concept

As defined by Jersild (1965, p. 9) "a composite of thought and feelings which constitute a person's awareness of his individual existence, his conception of who and what he is."

Tennessee Self-Concept Scale Variables

Self-Criticism Score (SC). These items are all mildly derogatory statements that most people admit as being true for them. Individuals who deny most of these statements most often are being defensive and are making a deliberate effort to present themselves more favorably.

Total Positive Score. This is the most important score, it reflects the overall level of self-esteem. People who score high on this scale tend to like themselves, have confidence in themselves, feel worth, and act accordingly.

Row 1 Positive Score (Identity). "What I am" items, how the individual sees himself.

Row 2 Positive Score (Self-Satisfaction). Those items where the individual describes how he feels about the self he perceives.

Row 3 Positive Score (Behavior). "This is what I do or this is how I act" items.

Column A (Physical-Self). How the individual views his body and physical abilities.

Column B (Moral-Ethical Self). The individual's feeling of being "good" or "bad", relationship to God, and satisfaction with his religion.

Column C (Personal-Self). The individual's sense of personal worth, adequacy as a person, and his overall evaluation of his personality apart from his body.

Column D (Family-Self). The individual's feeling of value and worth as a family member.

Column E (Social-Self). This reflects the individual's sense of worth and adequacy in his social interactions with others in general.

Summary

From the beginning of recorded history man has been involved in sport and physical activity. The Ancient Greeks were among the first to promote education for the total person, mind and body. A number of researchers have tried to understand the relationship between the mind and body with varying degrees of success: Andelman (1971), Blue (1979), Brunner (1969), Hughes (1973), Tucker (1982, 1983) and others. Physical

activity classes and several research studies support the concept while others do not. Folkins and Sime (1981) in their review of physical fitness and mental health studies found self-concept to be the most significant psychological component being studied.

Large numbers of students enroll in racquetball and rhythmic aerobics classes at the UNR each semester. Why do these students enroll in racquetball and rhythmic aerobics? Do the students feel better about themselves after a semester of participation in racquetball or rhythmic aerobics classes? The objective of this study was to find out if students did feel better about themselves. The study was conducted at the UNR during the fall semester of 1984. All female students enrolled in racquetball and rhythmic aerobics were asked to participate in the study as were female students enrolled in selected biology, English, home economics, RPED, and SHR classes. The TSCS was the measuring instrument in the pretest-posttest format.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The self-concept has been studied by psychologists, psychiatrists, educators, and physical educators since the existence of these disciplines. The amount of attention and study given to self-concept has varied over the years. Theories of Cooley (1902), Mead (1934), and Rodgers (1951) have given the term self-concept relevancy for current study. These authors emphasize that a process of social interaction was important in self-concept development. Over the years there has been a movement away from the study of one global self-concept to the examination of situation specific self-concepts.

Shavelson, Huber, and Stanton (1976) suggest that there is a self-concept hierarchy with general self-concept at the apex and situation specific self-concepts ranging below. The model Shavelson et al. suggest has general self-concept at the apex, subdivided into academic and nonacademic self-concepts. Academic self-concept is further divided into subject specific self-concepts. Nonacademic self-concept is divided into social, emotional, and physical self-concepts. The Shavelson et al. model is only one of many available for study. Fitts (1965) model for example has global self-concept subdivided into a matrix consisting of columns designated as; physical, moral-ethical,

personal, family, and social self-concepts. The rows in Fitts' matrix are identity, self-satisfaction, and behavior.

Self-concept studies either look at specific subdivisions of self-concept or at general self-concept and a specific subdivision. An example of the former is Shifron's 1982 study of vocational self-concept. Another example is Marsh's (1984) study of verbal and math self-concepts. The second type of study uses a self-concept scale that gives a general self-concept score and various subdivision scores as in the Wescott (1980) study using the Tennessee Self-Concept Scale (TSCS). This second type of study may be conducted using two different instruments, one to measure general-concept and another to measure a specific subdivision. Secord and Jourard's Self-Cathexis and Body Cathexis scales are examples of scales often used in this type of study.

Shavelson et al. (1976) identified seven features they felt were critical to the construct definition of self-concept. These features are; organized, multifarious, hierarchical, stable, developmental, evaluative, and differentiable. Rosenberg (1979) suggests three major components of self-concept; social identities, personal dispositions, and physical characteristics. Although these two examples appear to differ greatly, essentially they cover the same aspects of self-concept. The immediately following sections of this chapter presents different philosophical approaches to self-concept. It is intended to provide theoretical background for the review of physical activity and self-concept literature that follows.

Self-TheoryPsychoanalytic Approach to Self-Concept

According to Freud (1954), the father of psychoanalytic thought, the self is a combination of three factors that operate as a whole and constitute the "self". The id is the instinctual reservoir of man and has its basis in anatomy and physiology. It operates in accordance with the pleasure principle. The ego is the control apparatus of the psychic structure. The superego results from resolution of the Oedipus Complex and contains values of the parent.

The phallic stage is an area of psychological study upon which much emphasis for development of the self-concept has been placed. Puberty is the final step in the development of the self-concept; much energy is spent toward intellectual growth and social acceptance.. The difficulty in the transition period of puberty is that the individual "hangs in limbo between being considered an adult and being viewed as a child" (Freud, 1959, p. 63). The self-concept emerges from the struggle of the self to meet new demands and reach maturity.

According to Adler (1930) the primary source of human motivation is the instinctual striving for superiority; the main aim of life is the perfection of one's self. All other motives are expressions of this drive. Adler emphasized the uniqueness of each personality. Each person adopts a different way of pursuing superiority. The direction of the pursuit reflects the inferiorities perceived by the child and the mechanisms he has used in coping with them. Out of this develops the distinctive goals, interests, values, and personality traits that comprise the individual.

The Developmental Approach to Self-Concept

The developmental perspective of the self-concept is one of flow. The human organism is one that grows and develops due to the physical, mental, social, and emotional changes that occur throughout life. The self is viewed as a method of adapting through various stages of learning and synthesizing. "Developmentalists feel that growth is inevitable, sometimes painful, and that the self is a flexible entity which must follow and sometimes lead the process (Wilson, 1982, p. 70).

Sherif and Sherif (1969) feel that the self developed by relating to various objects including one's own body, other persons, groups, and values of the culture setting. Throughout life the individual acquires new ties, roles and changes in prestige. The "self-system does and must change if he is to behave consistently in terms of his altered relationships and responsibilities" (Sherif and Sherif, 1969, p. 21).

Piaget (1962) studied play and used it to describe the differentiation of the self from the environment. Because of the flexibility of the self, a child can try on various roles and explore his own identity and his relationships to others. Therefore exploration is possible, especially in a society where play is encouraged as a valuable activity for children. Piaget felt that play is not recreation as viewed by adults. According to Piaget, play is the actual learning of the pattern of social relations within a society. The changes in the type and function of play during childhood correspond to the growth sequence of images, thoughts, language and the formation of self-concept. Piaget described a model of the developmental stages of a

child's intellectual capabilities in which play assumed an important role.

Lommis (1960) described a comprehensive view of the self. He stated that the self consists of four basic qualities which are two paired opposites. These qualities are: individualism and interrelatedness, equilibrium and action. It is the composite self which holds together the two paired opposites. The self emerges in response to tension between the polar pairs. This gives rise to a unique individual.

The Sociological Approach to Self-Concept

Cooley (1902) was the creator of the "looking glass self" theory. In the looking glass theory, the social-self arises out of the reaction of a person to the perceived opinions of others. The looking glass idea has three principle elements: the imagination of one's appearance, judgement of that appearance, and self feelings of pride or mortification. Cooley believed that because the sense of self is dependent upon external forces, its development is a trial and error process of receiving feedback, reevaluating values, and resolution of various social roles and identities.

The Humanistic Approach to Self-Concept

Humanists believe that psychology should study direct, subjective human experience and man is viewed as essentially good (Wilson, 1982).

Maslow (1968) is often considered the father of the self-theorists. He was among the first to describe the healthy individual in humanistic

terms. His approach was a reaction to psychoanalytic descriptions of the self. However, he still viewed man in the perspective of his biological nature.

Rogers (1951) viewed man as an active participant in his own development. When a man is uninterrupted his development of self is in a positive direction. Rogers felt that a self-actualized person who developed his or her full potential was able to accept the innate aspect of himself or herself and to live subjectively. The self-fulfilled individual moved in self-selected directions, chose responsibly, thought, felt, and experienced. The individual was not merely an object in whom these events occur. According to Rogers (1951) there were three environmental factors necessary in creating healthy self-concepts. These factors were empathy, reflection of his or her feelings, and the unconditional positive regard from significant others.

According to the theory of transactional analysis and Berne (1964), the self is derived from communication patterns that contain the three entities: child, parent, and adult. These aspects of the self and how they interact with the aspects of another person are the basis for communication and its accompanying difficulties. Each person moves in and out of the different psychological states depending upon his or her self view and those with whom they are dealing.

New Approaches to Self-Concept

An individual seems to exhibit contradictory and inconsistent aspects of personality within that same individual. O'Connor (1971) encouraged the confrontation of man's many selves. She believed that this multiplicity is necessary as a part of being human. Rather than

trying to mold one's self into a single being, an individual should accept the contradictions and inconsistencies and use them for discovery and growth.

Self-Concept and Locus of Control

Seligman (1973) in his article "Fall into Helplessness", studied the relationship between depression and a person's locus of control. Seligman (1973, p. 43) stated; "an individual's susceptibility to depression depends upon the success or failure of his previous experience with controlling his environment." As humans succeed or fail, they gradually learn to anticipate the effectiveness or ineffectiveness of their efforts to affect their environment. Passivity is the primary symptom of learned helplessness. Beck (1973, p. 54) described it as "paralysis of the will," which plunges toward depression and a sense of being a victim of circumstances.

Research done with institutionalized mental health patients tends to support the theory of learned helplessness. In a study by Townsend (1976) of patients hospitalized on a long-term basis, the patients did not usually consider themselves as mentally ill. They saw themselves as people unable to deal with the pressures of a "normal life". A sense of powerlessness was a central theme.

Chandler (1976) tested college students on three measures; internality-externality, self-acceptance, and self-ideal discrepancies. He found that those rated as externals showed larger real-ideal discrepancies, lower self-concepts, and lower levels of self-acceptance.

Review of Physical Activity and Self-Concept

Introduction

Physical education and sport has long been associated with character development, the formation of good citizens, and healthy young men. More recently it has been conceded that if physical education and sport have such positive benefits for men then they may also have positive benefits for women.

Researchers have attempted, especially in the last decade, to determine if physical education activities and sport do positively affect the psychological aspect of an individual. The literature can be divided into two major categories, self-concept studies and personality studies. Each category can be further subdivided into those studies dealing with the physical fitness aspects of sport and physical education and those studies and personality studies. The majority of the published literature the researcher has read has dealt with personality, that is the first review of the physical activity and self literature followed by physical activity and self-concept literature.

Personality and Physical Fitness

The most commonly cited studies in the area of personality and physical fitness are the works of Ismail and his co-workers. Ismail and Falls (1965) began their initial research exploring the biochemical changes that occur as a result of aerobic exercise. After observing hundreds of men passing through the program they became aware that the personalities of these men were affected. Ismail's later research included personality variables as part of the research.

One of Ismail's and Tractman's (1973) best known studies investigated the personality changes of high and low fit, middle aged men. After four months of running, calisthenics, and sports participation the low fit group showed substantial gains in emotional stability, imagination and self sufficiency. Similar results were found in a study by Ismail and Young (1973). The results of this study indicated that highly fit individuals are more emotionally stable, mature, and possess higher ego strength than low fit persons.

Ismail and Young (1976) studied high and low fit males with the added variables of old and young. Personality and fitness levels were tested before and after a four month physical fitness program. Three personality tests were used; the Cattell 16 Personality Factor Inventory (PFI), the Eysenck Personality Inventory, and the "In General" form of the Multiple Affect Adjective Check List (MAACL). Results indicated significant differences on thirteen of the twenty personality variables. The high fit group was characterized as more unconventional, composed, secure, easy going, emotionally stable, adventurous, and more intelligent than the low fit group. Although all groups had improved, the high fit group scored higher than the low fit group. The authors concluded that four months may not have been sufficient time for the low fit group to catch up to the high fit group.

In 1980 Elsayed, Ismail and Young reported on a study which used the factor of intelligence as a variable. Using the pretest-posttest format they found that before an exercise-jogging program, regardless of the age the high fit group had a significantly higher total intelligence score than the low fit group. At the end of the study the combined four

groups scored significantly higher in their posttest intelligence scores as compared to their pretest scores. The researchers stated that it was not clear whether the improvement in cognitive functioning was due to physiological or psychological changes or both. The research did indicate a change in cognitive functioning as some kind of result of the exercise-jogging program. Carron and Witsell (1975) studied fifteen-year-old males using the Cattell P.F.I. and Gough's Adjective Check List. They found no significant differences on either personality test between the high fit and low fit groups in this younger sample of males.

Tillman (1965) conducted a two phase study using 386 high school and junior high school boys to investigate the relationship between physical fitness and selected personality traits. Using the pullups and 600 yard run items of the American Alliance of Health, Physical Education, Recreation and Dance (AAHPERD) fitness test; the upper 15% and lower 15% were given a battery of three personality tests: the A-S Reaction study of Allport, Cattell's 16 P.F.I. and the Kuder Preference Record. A significant difference was found between the groups on all batteries. On the A-S Reaction study test the upper fitness group had higher ascendance ratios. The upper group was more surgent, more socially dependent, and less tense as measured by the Cattell 16 P.F.I. On the Kuder Preference Record the upper group had a greater preference for outdoor activities, more interest in social service, and scored higher on the scientific and mechanical scores. The low fitness group scored significantly higher on computational, musical, and clerical scores. In phase II, Tillman (1965) divided the low group into a control group and an experimental group. The experimental group was

placed on a nine month "strenuous" fitness program while the control group attended regular physical education classes. At the end of the nine month period both groups were again administered the same personality battery and fitness tests. With the exception of the clerical score on the Kuder Preference Record, the only significant difference between the two groups was on fitness. The control group had significantly higher scores on the clerical scale. The experimental group scored higher than previously on physical fitness but was still only at the 44th percentile on the two AAHPERD fitness test items where as the original high fit group scored at the 92nd percentile. In summation Tillman (1965, p. 484) said "It appears that conclusive evidence is needed to substantiate some of the claims that have been advanced about the relationship between physical fitness and personality."

Jogging and cycling programs were used by Buccola and Stone (1975) with men aged 60-79 years to study physiological and personality effects of exercise. The volunteers participated in a fourteen week program of either walking/jogging or cycling. The physiological changes were significant in both groups, but there was no change in the personality factors measured for the cyclers. However, the walkers/joggers became less surgent and more self-sufficient.

Psychological characteristics of joggers were studied by Francis and Carter (1982). Forty-four male joggers were divided into four categories based on the number of miles jogged per week. All jogging groups were similar except for miles jogged. Using an instrument that measures anxiety, hostility and depression, MAACL, the researchers found

that joggers were lower on anxiety, hostility and depression than the normative scores for the instruments. The researchers concluded "that chronic exercise is beneficial in the reduction of anxiety and tension." (1982, p. 389-390)

In a study by Brunner (1969) working with sixty adult males divided into matched groups of regular exercisers and nonexercisers; the exercisers scored significantly higher on intraception, number of favorable adjectives checked, defensiveness, achievement, dominance, and self-confidence. The nonexercisers were higher on succorance and counseling readiness.

Sharp and Reilly (1975) used the Minnesota Multiphasic Personality Inventory (MMPI) to investigate personality and aerobic fitness of 65 college males. The subjects participated in a ten week course of aerobic conditioning. The researchers found a positive correlation between aerobic fitness and the positive scales on the MMPI. There was a negative correlation for the more negative scales, the authors did not state what the negative scales were. It also appeared that the subjects who scored highest on the fitness pretests "gained the most psychologically, but the least physically." (Sharp and Reilly, 1975, p. 429).

Lankford (1980) in a study of runners and anxiety found that the group that logged the most mileage increased in cardiovascular fitness and decreased in state anxiety. In a study conducted by Folkins (1972), psychological effects of a fitness program for adult males with high risk of coronary heart disease were studied. The exercise group showed a significant increase in physical fitness and reduced scores on the Anxiety and Depression scales of the MAACL. The nonexercising control

group did not show corresponding changes. Jones (1981) studied college students enrolled in racquetball, jogging and a special meditation class in relation to anxiety. After ten weeks he found that the racquetball group increased in state anxiety (transitory) and decreased in somatic anxiety (feelings of physical tension). The running group decreased somatic and cognitive (feelings of mental tension) anxiety. The meditation group had to be treated separate statistically since the pretest scores showed them to be very different from the other groups. The meditation group exhibited decreased mean scores in all areas of anxiety.

Keith (1974) administered the Motivational Analysis Test and a physical activity questionnaire to 92 males aged twenty-two to sixty-eight. The subjects were divided into active and inactive groups. Results indicated that the inactive group tended to avoid risk and have a more rigidly developed super ego. For the more active group there were higher scores on items suggesting increased sex drive and sensual indulgence of all kinds plus a higher degree of self-love. However, there was a seven year mean age discrepancy between the active and inactive group. The active group was younger. This factor was not considered in the study.

Lynch and Garner (1972) studied 42 junior college students enrolled in jogging classes and 42 students in archery and golf classes. There were equal numbers of males and females in each group. The self-confidence and personal adjustment scales of the Adjective Check List (ACL) were used. The anxiety and depression scales of the MAACL were also used. To evaluate sleep and work, two 9-point self-rating scales

were used. It was determined that the experimental group and control groups were different at the pretest. Comparisons between these groups were inappropriate.

There is an increasing amount of literature indicating mood variables may be changed with changing levels of physical fitness. McPherson, Pavo, and Yuhasz, Rechnitzer, Pickard, and Lefevé (1967) studied cardiac patients participating in a twenty-four week exercise program and compared them to a nonexercising group of cardiac patients and a normal group of subjects in the same exercise program. The exercising cardiac patients experienced the most favorable overall changes in mood states on a fifty item semantic differential instrument. The authors suggest the reason for this as "those who are in the poorest physical and/or psychological condition will show the greatest improvement both physically and psychologically." (1972, p. 507). This conflicts with conclusions drawn by Sharp and Reilly (1975).

Hartz, Wallace and Clayton (1982) working with seven clinically depressed subjects found mood elevations for the two subjects who had increased their aerobic condition during the study. Blue (1979) working with two clinically depressed subjects used an aerobic conditioning program in an attempt to decrease depression in both patients. After three weeks both patients' depression scores had moved from moderately depressed to mildly depressed. Blue cautioned that the design was not one in which generalizations could be made. He did suggest a need for future study.

Carter (1977) studied the question of whether physical exercise makes people happier. A questionnaire was given to 216 adults in

Washington D.C. They were asked to complete the questionnaire on exercise, health, weight and happiness. The results indicated a significant correlation between the exercise scores and level of happiness rating. Of those who rated themselves as very happy 72% were maintaining "an optimal" level of physical fitness but only 37% of those rated as pretty happy and 35% rated not too happy were "optimally" physically fit.

Personality and Skill

A review of the literature concerning personality and skill tends to focus on comparisons made between athletes and nonathletes such as the study by Berger and Lifflefield (1969). Comparisons were made between thirty varsity college football players, thirty former high school football players, and thirty nonfootball players. When scholastic achievement was controlled no significant differences at the .01 level were found between the groups on the California Psychological Inventory (CPI). Conversely, O'Connor and Webb (1976) studied five groups of coeds who participated in the intercollegiate sports of tennis (N=9), basketball (N=13), swimming (N=13), gymnastics (N=6), and a group that did not participate in sports (N=14). Cattell's 16PFI was the psychological test used and significant differences were found on the intelligence, radicalism, self-sufficiency, and control factors between the athletes and nonathletes. The results were inconclusive since there were more significant differences among the athletic groups than between the athletes in total and the nonathletic group.

In an earlier study much like Berger and Littlefield (1969), Schendel (1965) administered the C.P.I. to 334 team sport athletes and

nonathletes. The athletic group was divided on the basis of year in school and whether a starter or a substitute on their team. The ninth grade and twelfth grade athletes scored consistently higher on the personnel adjustment group of the CPI scales. The ninth graders in particular possessed more leadership qualities and qualities that lead to social status. They were more sociable, socially mature, and conventional in their responses in social settings. They possessed greater intellectual efficiency.

In a study comparing collegiate baseball and tennis players, Singer (1969) using the Edwards Preference Schedule was unable to find significant differences within the groups or between them. He did conclude that there were personality tendencies that a better instrument might have found significant.

In a study using the Guilford-Zimmerman Temperment Survey, Behrman (1967) found significant differences in personality between swimmers and nonswimmers. The swimmers tended to be more impulsive, sociable, hostile and belligerent while the nonswimmers tended to be more restrained, serious, shy, seclusive, friendly and agreeable. Differences were also found between beginning swimmers who were learning to swim and those who were not successful at learning to swim. The nonlearners were less emotionally stable than the learners. Using the Cattell 16 P.F.I., Pyecha (1970) compared the effects on personality of Judo classes to handball-badminton, and basketball-volleyball classes on male college freshmen. He concluded that the judo group became more warmhearted, easy going, and participating than did either of the other groups.

In studies dealing with motor ability, Merriman (1960) compared the relationship of personality to motor ability. He grouped 808 high school boys as follows: (a) upper and lower motor ability; (b) athletic and nonathletic according to motor ability scores; (c) team sport participants; (d) individual sport participants; and (e) combined team and individual sport participants. The author concluded that motor ability is related to personality traits. He also concluded that motor ability was more related to personality than athletic participation.

Self-Concept and Physical Fitness

Hilyer and Mitchell (1979) used the Tennessee Self-Concept Scale (TSCS) and Cooper's twelve minute run test as test instruments for their study of low self-concept college students. They studied three groups of forty students assigned randomly to a running program, running and counseling, and a control group. The groups were internally divided into low and high self-concept subgroups. The low self-concept students in the counseling and running group made significant gains in self-concept. The authors suggested that a treatment period longer than ten weeks might make a difference in self-concept for the low self-concept running group.

Hughes (1973) used the TSCS to measure the self-concept change between four groups of body conditioning classes whose instructors used different teaching methods. In comparing the pretests and posttests no significant difference between the groups was found at the end of the quarter. She found that the power of the test was too low to accept or reject the findings due to the small sample size, $N = 28$. In a study by Jacobs (1977) comparing the self-concept change of joggers and golfers

over a 10 week period, no significant difference was found. Jacobs concluded that improved cardiovascular fitness was not related to improved self-concept. The author suggested an instrument more precise than the Q-sort self-concept device might be necessary. However, White (1974) detected significant changes in subscales of the TSCS after a semester physical training program. The randomly selected experimental group (N=76) participated in a special physical training period over the semester while the randomly selected controls (N=76) engaged in a normal program of activities. The experimental group was found to have significantly better scores on all fitness items and higher scores on the TSCC subscales of behavior and physical-self. Christian (1969) studied college students in four weight training and two archery classes for six weeks. The purpose of the study was to look for a difference in self-concept between the two groups. The weight training classes were divided into "progress given" and "no progress given" groups. At the end of the treatment period both weight training groups showed significant improvement over the archery group. There was no difference between the two weight training groups.

Using the Body-Cathexis and Self-Cathexis Scales, Josting (1981) found in a study of 66 community college students that participated regularly in physical activity had significantly higher scores on both tests. In studies by Kostrubala (1976), Elsayed et al. (1980), Ismail and Young (1976), K.H. Cooper (1968) a significant relationship has been found between aerobic activities and feelings of control over one's life which enhances self-concept.

Aerobic dance, an equivalent to rhythmic fitness, was studied by Teng (1982) in relation to self-esteem and social supports. He found that those aerobic dance subjects who had average or below average physical self-concepts before the quarter showed significant improvement by the end of the quarter. Teng used the TSCS to measure self-esteem in a pretest-posttest designed study. The experimental group (N=93) and the pure controls (N=84) were the focus of the study. There was a group of control subjects (N=30) who started an exercise program other than aerobic dance during the quarter. Using three one-tailed t-tests for post-hoc comparisons of the experimental and control groups, Teng determined that a significant difference of $p=.02$ existed between the new exercise controls and the aerobic dance group. There is a possibility of a difference occurring between the pure controls and the experimental group, $p<.06$. When the two control groups were combined and compared with the experimental group the difference was significant at the $p=.02$ level of confidence. He suggested that prescriptive aerobic dance may be of benefit in therapeutic situations. More study in this area is needed.

In another aerobic dance study, Wilson (1982) tested four groups of female aerobic dancers. Using the Personal Orientation Inventory (POI) she found that all groups that had been participating in aerobic dancing had higher self-concept scores than the nonaerobic dancers. However, Wilson's study used a unique design that tested all dancers only once and then compared those just beginning to those who had been involved in aerobic dance for various periods of time. Recommendations for further study suggest using a pretest-posttest strategy and a different more

universally accepted testing instrument. In yet another study with aerobic dancers, Shifron (1983) found that the amount of aerobic dance participation and level of education were the best predictors of vocational self-concept. Vocational self-concept refers to attitudes, values, needs, and abilities one has in regards to vocations. This is a specialized type of self-concept. Shifron used the Vocational Rating Scale (VRS), which correlated well with the Total Positive score of the TSCS, to measure vocational self-concept. The study consisted of five groups that were determined by the number of sessions the subjects had been enrolled in aerobic dance. Using a t-test as the method of analysis, Shifron found that all the groups with previous aerobic dance experience had significantly higher vocational self-concept scores than the beginning aerobic dancers.

Tucker (1982) studied the effect of a weight training program on self-concept of college males. Sixty students enrolled in weight training classes that met twice a week for a semester were compared to nonweight lifters enrolled in history classes. Using the TSCS the researcher found that while there were no significant differences in global self-concept between the experimental group and the control group in the pretest, there were differences in the posttest. The weight lifters had made significant gains on eight of the nine self-concept dimensions surveyed. In a later study Tucker (1983), using 272 college males in a near duplication of his earlier work, found that the experimental group of weight lifters scored significantly higher than the control group on self-concept and the added Body Cathexis Scale. Tucker's (1983) second study corrected control and statistical

questions, lending credence to the concept that weight lifting has a positive effect on male self-concept.

Leonardson (1977) used 165 high school and 33 college students to study the relationship between perceived physical fitness and self-concept. His findings indicated that perceived physical fitness and self-concept scores were significantly but moderately correlated. "Physical fitness, determined on the basis of perceived or actual physical performance, seems an important aspect of the construct of self-concept" (p. 62).

In a study by Collingwood (1972), using 25 matched pairs of male rehabilitation patients divided into an experimental group and a control group using standard rehabilitation services; significant results were found. The experimental group received the same services as the control group plus a daily physical training program for four weeks. The experimental group increased scores on self-concept, self-acceptance and physical fitness. Johnson, Fretz, and Johnson (1968) studied 74 children with emotional disturbances, brain damage, or mental retardation. An individualized neuromotor training program twice a week for six weeks was used as treatment for the subjects. No conclusions could be drawn with this group about self-concept or physical development. Rohrbacher (1973) found when studying obese boys in a special eight week camp, that although their body image scores showed significant improvement their self-concept scores remained unchanged. In a well known study by Collingwood and Willett (1971), the relationship between self-concept, body attitude and physical fitness of five obese teenagers was studied. Each subject participated in 30 hours

of jogging and swimming over a three week period. At the end of the training period all subjects had demonstrated significant improvement on the physical fitness and body attitude tests. On the Index of Adjustment and Value, significant increases in both self-concept and self-acceptance were found. Due to the small sample size generalizations should not be made from this study, however.

Studying 72 elementary students, Bruya (1977) found no improvement in self-concept after eight 1\2 hour sessions of selected basketball skills. One-half the students were male and one-half were female. Two intact classes were assigned as experiments and two classes as controls. This conflicts with the findings of Collingwood and Willett (1971), although eight 1\2 hour periods over four weeks may not be enough treatment to elicit a change of any kind. McGowan, Jarman and Pederson (1974) found after an 18 week running program for low self-esteem seventh grade boys a significant difference in cardiovascular fitness and self-concept between the running group and a matched control group that did not have physical education, total N=37. However, during the training period whenever the experimental group was in competition with the rest of the physical education students the experimental group was given positive reinforcement and even contrived victories. This raises the question whether the improvement in self-concept was due to the physical fitness training or the positive reinforcement.

Self-Concept and Skill

Snyder and Kivlin (1975) studied 328 women who were grouped as athletes, gymnasts, basketball players and nonathletes. Using a self-concept questionnaire and the Body Cathexis Scale, they found that women

athletes had significantly higher scores than nonathletes on self-concept and body image. Vincent (1976) in a similar study used the TSCS and 460 female college students to determine if differences in self-concept scores existed between groups. The subjects were grouped as; (a) athletes vs nonathletes; (b) physical education majors vs general students; and (c) those who had been high school athletes vs those who had not been. Physical education majors had higher total self-concept scores than general students. High school athletes scored higher on self-concept than nonhigh school athletes. College athletes were also significantly different from nonathletes even when the variable of nonphysical education major and high school athletes was held constant. Thusly, Vincent concluded that athletic participation had a positive affect on self-concept. Conflicting results were found in a study by Ibranim and Morrison (1976). Using the TSCS and POI to compare 100 nonathletes at the college and high school level, they found that athletes generally had lower self-concept scores but higher self-actualization scores when compared to the nonathletes. At the high school level no significant differences were found between the female athletes and non-athletes but significant differences were found between the male groups. At the college level the reverse was found, significant differences were found between the female groups but not between the male groups. No conclusions were drawn as to why these results might have occurred. The authors did not speculate whether winning or losing had an effect on self-concept.

Kay, Felker and Varoz (1972) studied relationships between self-concept, sports abilities, and personal and parent interest in sports

for junior high school boys. Significant positive relationships were found between reported interest in sports and self-concept. Similarity of sports interests between parents and children also appeared to be related to self-concept.

Comparing the effects of motor skills on self-concept Martinek, Zaichkowsky, and Cheffers (1977) studied 230 elementary school children. The students were divided into two equal groups. An additional 115 elementary students were used as a control group. One of the experimental groups participated in a physical education program which involved the students in the decision making (horizontal model) aspects of the class; the other group (vertical model) was not involved in the decision making portion of the physical education program. The nondecision making group improved in motor skills while the decision making group improved in self-concept. The researchers found their research did not support the contention that motor ability and self-concept are related. Lyndon and Cheffers (1984) found some conflicting results in their study using the two models of Martinek et al. (1977) and a similar research design. These researchers studied 285 elementary students at two schools. One of the matched schools had two class rooms for each grade so it was the experimental school while the smaller school, one class per grade, was the control group. The findings for this study indicated physical education, either model, helped coordination but had no effect on self-concept. There was no difference on motor skill development between the models, and no relationship between self-concept and coordination. One could question the use of intact classes when one class at each grade level was given horizontal

or vertical treatment. Especially in light of the findings of another study, Schempp and Cheffers and Zaichkowsky (1983), which used intact classes and one school. The design and tests were similar with exception of coordination in the previous study and the variable of creativity replacing it in the later named study. The findings of this study of 208 elementary students found physical education, either model: improved creativity, motor skills and self-concept. The horizontal model produced higher scores on all three variables over the vertical model; this conflicts with Martinek et al. (1977). These three studies are indicative of the confusion found in many areas of self-concept research.

Mauser and Reynolds (1977) studied twelve children with perceptual motor deficiencies. They participated in an eight week developmental physical activity program. Significant increases in body coordination occurred with no significant change in self-concept. An N of 12 is too small to allow generalizations to be made to other populations.

Jette (1975) found no significant differences in her study of 80 subjects in modern dance with music; modern dance with rhythmical accompaniment; and a control group. She suggested that more subjects and a longer treatment period might produce different results. The use of a self-concept instrument other than the Loewinger Sentence Completion Form might also be warranted. Using a random block design, Millett (1974) randomly selected two of the twenty-three social dance classes at Brigham Young University (BYU) as his experimental group. The control group was selected from another recreation class. Using the TSCS and Body Cathexis Scale; no significant differences were found

between the two groups over the semester. Selecting more dance classes and a control group not involved in recreation were some of the recommendations for further research.

In a study of college females, Harris (1968) found no significant differences between a bowling class, contemporary dance class, and a class in movement fundamentals. The TSCS was used to test the three groups of 30 on a pretest-posttest basis. One of the recommendations was to use a control group in similar studies. Deese (1975) studied the effect of two methods of tennis instruction on the self-concept of 44 college students. No significant differences were found between the groups. Recommendations for further study included a control group, a treatment time longer than ten weeks, and different activities.

Alderman (1975) used five graduate students in her study of dance therapy and self-concept. Dance therapy was defined as improvisational dance and, in general, as movement through time and space. She found that four of the five students improved in their movement patterns and also in self-concept. Similarly Schofield and Abbuhl (1975) found that a five minute session of body movement exercises enhanced self-awareness significantly.

In a study that included racquetball, Meakley (1981) used tennis, racquetball, and fitness for life classes to test a self-concept instrument he had designed. The TSCS was used to help establish the reliability of the instrument. With the small sample size (total N=37) it was difficult to generalize Meakley's findings, however, the fitness for life class had the most effect on global self-concept but was not significant. Racquetball scores showed the greatest gains in physical

self-concept with the younger students and this was significant. Recommendations for further study include larger sample sizes and a control group.

Shadow (1979) in his study of airmen found the number of minutes spent exercising each week had more effect on self-concept than the type of activity. Wescott (1980), in her study of college physical education classes and self-concept had mixed results. The researcher found that the experimental group of physical education classes showed a significant increase in self-concept over the control group of science students. Specific class results were: (a) body mechanics improved significantly on the four parts of the TSCS used; (b) social and square dance improved positively on two subscales and negatively on two; (c) in men's gymnastics classes no significant changes occurred; (d) women's gymnastics self-concept scores improved significantly on two measures; (e) no improvement in self-concept scores was found in bowling classes; (f) elementary tennis results were dependent upon who the instructor was; (g) intermediate tennis indicated significant improvements on two factors; (h) there were no significant results in the swimming classes; (i) in intermediate modern dance no significant differences were found; (j) in weight lifting for men classes no significant differences were found; and (k) in jogging for women classes no significant differences were found. These results are indicative of the confusion that abounds in the literature on self-concept and physical education. Many of these class sizes were too small to carry much statistical power.

Folkins and Sime (1981), Browman (1981), and L. Cooper (1969), in their various reviews of the literature in the area of physical activity

and the psychological aspects of man, have found that much of the literature cites studies with small sample sizes, no control groups, poor experimental design, insufficient treatment periods, and questionable measuring instruments. Even when researchers attempt similar studies the results are often confusing as indicated by looking at the work of Martinek et al. (1977), Lyndon and Cheffers (1984) and Schempp et al. (1983). All the reviews cited recommend further work in this area with at least quasi-experimental research design.

Summary

The literature concerned with physical fitness, sport, personality and self-concept presents conflicting results as reported in this chapter. Folkins and Sime (1981), Browman (1981), and L. Cooper (1969) in their various reviews of the literature of physical activity and the psychological aspects of man have found a number of studies that add little to our knowledge on this subject. Poor statistical design and small sample sizes are most often mentioned when the reviewers question the findings of studies. All reviews suggest more research needs to be done with at least quasi-experimental design and sufficient numbers for the test to be statistically powerful. Another problem indicated by the reviewers has been the use of questionable measuring instruments. The TSCS was found by Folkins and Sime (1981) to be a useful instrument when they reviewed self-concept and physical fitness. Of the psychological variables examined by Folkins and Sime they found that self-concept studies contributed more to knowledge in the area of physical activity and the psychological nature of man.

In spite of the conflicting results presented in this literature review, a few generalizations can be made. In studies of adult males it appears that there is probably a significant positive relationship between fitness and personality. The area of study with the most conflicting results is the studies of children and adolescence. As a part of a rehabilitation program for adults, fitness activities are positively related to positive personality change.

In the studies dealing with skill activities, most of the researchers attempted to compare athletes and nonathletes; conflicting results are reported. A few studies attempted to study nonathletes in physical education classes. In most instances the results were difficult to interpret due to small sample sizes, small control groups or the use of a variety of testing instruments. In the few studies dealing with females the results were either conflicting or confusing. Aerobic studies have more often than not been closely related to positive personality and self-concept changes. Tables 1 and 2 summarize the studies cited in this literature review that deal with racquetball and rhythmic fitness.

Table 1. Summary of Racquetball Studies

Researcher	Jones	Meakley
Year:	1981	1981
Instrument:	Physical Symtoms Quest	TSCS
Psychological Variable:	Anxiety	Self-Concept
Other Activities Evaluated:	Running Mediation	Tennis Fitness
No. Subjects:	85	74
No. Control:	None	None
Significant Results:	Yes*	No

*These items must be examined to fully understand the implications.

Table 2. Summary of Rhythmic Aerobic Studies

Researcher:	Shiron	Teng	Wilson
Year:	1982	1982	1982
Instrument:	Vocational Rating Scale	TSCS	POI
Psychological Variable:	Vocational Self-Concept	Self- Esteem	Self- Concept
Other Activities Evaluated:	None	None	None
No. Subjects	465	133	93
No. Control:	117*	114	None
Significant Results	Yes*	Yes*	Yes*

*These items must be examined to fully understand the implications.

CHAPTER III

METHODS AND PROCEDURES

Introduction

This chapter will deal with the following specific assumptions and procedures: (1) population description and sampling procedures; (2) method of collecting data; (3) instrumentation; (4) statistical hypothesis; (5) method of analyzing the data; (6) precautions taken for accuracy and (7) a summary of the chapter.

Population Description and Sampling Procedures

The subjects for this study were female students enrolled in racquetball and rhythmic aerobics physical education classes during the fall semester 1984 at the UNR. Only female students were studied, since rhythmic aerobics has a 93.7 percent female enrollment. The number of male students in rhythmic aerobics was too small to allow for statistical comparison with the control and racquetball groups; therefore, males were eliminated from the study.

The control group was comprised of students enrolled in selected biology, English, home economics, recreation and physical education (RPED) and social and health resources (SHR) classes.

Method of Collecting Data

Two weeks prior to testing, all instructors involved in administering the TSCS were given written instructions (Appendix C) and an oral explanation of the procedures to be used in the study. All rhythmic aerobics classes were tested by the same trained research assistant, all control classes were tested by the researcher, and thirty-three of the forty-two racquetball testings were administered by the researcher. Three of the racquetball instructors administered the remaining nine testings. These instructors observed the researcher administer the test, and were given written and oral instructions.

The pretesting occurred during the second week of the 1984 fall semester as the class enrollments began to stabilize, yet before much physical activity had occurred. The Labor Day holiday fell within this week and made it difficult to test all thirty eight classes within that week; therefore, the home economics class was tested Friday of the first week.

Each instructor of the classes involved in the study explained that the RPED department was sponsoring a study concerned with the effect of certain college classes upon students enrolled in them. All students were asked to participate in the study to aid the RPED department in obtaining accurate results. Male students were asked to participate although the researcher did not anticipate using the data in this study due to the small number of males enrolled in rhythmic aerobics.

The test administrators gave each student a consent letter (Appendix A), a TSCS test booklet, answer sheet, and a demographic information form (Appendix B). If the student decided to participate in

the study, he or she signed and dated the consent letter, completed the TSCS by placing the answers on the answer sheet, and completed the demographic information form. Students were cautioned not to complete the demographic information form on top of the answer sheet which had carbon paper in the center.

After the students completed the test, the test administrator collected the materials separating the consent letter from the other materials. The demographic information form and TSCS answer sheet were kept together until the researcher verified that both forms had matching identification numbers, the last four digits of the student's social security number. The materials were placed in a manila envelope coded with the class number, section number and instructor's name. The envelopes were then returned to the researcher's mail box in the main RPED office. When the researcher collected them they were secured in a locked file.

The posttest occurred one week before the conclusion of the 1984 fall semester. This time was selected to allow the maximum amount of time between tests. The same testing procedures were followed with two exceptions (1) no consent letter was necessary (2) only those students who had participated in the pretest were asked to complete the TSCS and the second demographic form (Appendix D).

Tables 3, 4 and 5 indicate the numbers that began the study and those that did not complete the study. Of the control group 65.7% completed the study, the racquetball group 41.9% and the rhythmic aerobics group 46.8%. Two factors contributed to the large dropout rate: (1) the first testing occurred before the end of the UNR drop and

Table 3. Control Group Membership

Class		Pretest Numbers	Posttest Numbers	Completion Percentage
Biology	201001	29	21	72.4
English	102008	8	3	37.5
English	241002	12	9	75.0
English	484001	9	6	66.7
Home Economic	121001	48	21	43.8
RPED	354001	21	21	100.0
SHR	220001	<u>42</u>	<u>30</u>	<u>71.4</u>
		169	111	65.7%

Table 4. Experimental - Rhythmic Aerobics Group Membership

Class		Pretest Number	Posttest Number	Completion Percentage
RPED	178000	8	3	60.0
RPED	178002	16	12	75.0
RPED	178003	12	6	50.0
RPED	178004	24	11	45.8
RPED	178005	25	11	44.0
RPED	178006	17	7	41.2
RPED	178007	34	19	55.9
RPED	178008	30	18	60.0
RPED	178009	32	11	34.4
RPED	178010	<u>27</u>	<u>6</u>	<u>22.2</u>
		222	104	46.8%

Table 5. Experimental - Racquetball Group Membership

Class		Pretest Numbers	Posttest Numbers	Completion Percentage
RPED	132001	6	2	33.3
RPED	132002	4	1	25.0
RPED	132003	3	2	66.7
RPED	132004	5	3	60.0
RPED	132005	6	4	66.7
RPED	132006	9	5	55.6
RPED	132007	6	4	66.7
RPED	132008	9	4	44.4
RPED	132009	8	3	37.6
RPED	132010	11	3	27.3
RPED	132011	2	-	00.0
RPED	133001	-	-	----
RPED	133002	7	2	28.6
RPED	133003	-	-	----
RPED	133004	4	3	75.0
RPED	133005	1	1	100.0
RPED	133006	4	-	00.0
RPED	133007	1	-	00.0
RPED	133008	4	2	50.0
RPED	133009	-	-	----
RPED	133010	<u>3</u>	<u>-</u>	<u>00.0</u>
		93	39	41.9%

add period; (2) if a student was absent during the second testing there was no attempt made to find that student for testing. One other factor

contributed to the lower completion rate for the experimental groups. All RPED activity classes at UNR are graded pass or fail. It is common practice for students to fulfill activity course requirements before the end of the semester and for the attendance to drop in the activity classes. The researcher was concerned about the high dropout rate and, therefore, hypothesis 6 was written.

Instrumentation

The TSCS was selected as the testing instrument for this study, since it met the researcher's criteria for the study, that criteria being an established reliability and validity, commonly used for similar research, easily administered, and appropriate for the age group tested. According to Fitts (1965) the TSCS has an established reliability and validity, it is the single most commonly used self-concept testing instrument cited in the literature; it is self-administering to groups or individuals; and it is appropriate for individuals with at least a sixth grade reading level.

The TSCS consists of 100 self "descriptive statements which the subject uses to portray his own picture of himself." (Fitts, 1965,p.7)

For example:

I have a healthy body.	1	2	3	4	5
I am a friendly person.	1	2	3	4	5

The subject is instructed to circle the one if he feels the statement is completely false, two if mostly false, three if partly false and partly true, four if mostly true, and five if completely true.

Ten of the 100 statements come from the L Scale of the Minnesota Multiphasic Personality Inventory and constitute the Self-Criticism Score. The remaining 90 statements contribute to the self-concept scores. These 90 statements are organized into a rectangular matrix divided into rows and columns. There are three horizontal rows which describe Identity, Self-Satisfaction and Behavior. The five vertical columns are Physical-Self, Moral-ethical Self, Personal-Self, Family-Self and Social-Self. There is also a Total Positive Score which is considered the most important of all scores, since the intercorrelations among the different subscales is high. The Total Positive score is a total of column scores, which deal with external forces of references the individual uses to describe himself, and the row scores which are concerned with how the individual describes himself from an internal frame of reference.

TSCS Reliability

Fitts (1965) reported reliability coefficients, by test-retest, in the range of .80 to .90 for the various scores. He further reported on a study by Congdon who used a shortened version of the Scale and still obtained a reliability coefficient of .88 for the Total Positive Score. According to Fitts there is other evidence of reliability found in the remarkable similarity of profile patterns found through repeated measures of the same individuals over a long period of time.

TSCS Validity

Content validity is the principle type of validation for the TSCS. In the initial development of the TSCS a large pool of self-descriptive

items was compiled. Seven clinical psychologists classified the items according to the three by five matrix of rows and columns. They also judged whether the item had a positive or negative connotation. The ninety self-concept items used for measuring self-concept were the ones that were unanimously agreed upon by the judges. The remaining ten items are part of the L-scale of the MMPI.

Statistical Hypotheses

Ferguson (1976) states that it is common to set levels of significance at either 0.05 or 0.01. For the purpose of this study all hypotheses were tested at the 0.05 level of significance. The following null hypotheses were tested:

Hypothesis 1 (H1) : There will be no significant difference in pretest self-concept scores of female UNR students during the fall of 1984 among the racquetball, rhythmic aerobics, and control groups.

Hypothesis 2 (H2) : There will be no significant difference in posttest self-concept scores of female UNR students during the fall of 1984 among the racquetball, rhythmic aerobics, and control groups.

Hypothesis 3 (H3) : There will be no significant difference in posttest self-concept scores of female UNR students during the fall of 1984 between the following groups:

- a. Low self-concept students -- less than 315 Total Positive Score.
- b. High self-concept students -- more than 376 Total Positive Score.

Hypothesis 4 (H4) : There will be no significant difference between pretest and posttest self-concept scores of female UNR students

during the fall of 1984 enrolled in sections taught by different instructors in the following groups:

- a. Rhythmic Aerobics
- b. Control

Hypothesis 5 (H5) : There will be no significant difference in posttest self-concept scores of female UNR students during the fall of 1984 in the following groups:

- a. Racquetball - those who exercised less than three times per week and those who exercised three or more times per week.
- b. Rhythmic Aerobics - those who exercised less than three times per week and those who exercised three or more times per week.
- c. Control - those who exercised regularly and those who did not exercise regularly.

Hypothesis 6 (H6) : There will be no significant difference between self-concept scores of female UNR students during the fall of 1984 who completed the study and those who did not complete the study.

Hypothesis 7 (H7) : There will be no significant difference in self-concept gain scores of female UNR students during the fall of 1984 among the racquetball, rhythmic aerobics, and control groups.

Hypothesis 8 (H8) : There will be no significant difference in posttest self-concept scores of female UNR students who have participated in a similar activity and those who did not participate in a similar activity before the fall semester of 1984. Similar activities are racquetball, rhythmic aerobics, and racquetball or rhythmic aerobics for the following groups respectively:

- a. Racquetball

- b. Rhythmic Aerobics
- c. Control

Method of Analyzing the Data

Hypotheses 1, 6 and 7 were tested using a one-way analysis of variance (ANOVA) to determine if significant differences existed among the groups.

Hypotheses 2, 3, 4, 5 and 8 were tested using a one-way analysis of covariance (ANCOVA) to determine if significant differences existed among the groups. The covariant for the ANCOVA was the pretest scores of the students in the groups.

The statistics were calculated at UNR and MSU using the Statistical Package for Social Sciences (SPSS), releases eight and nine respectively. Mainframe computers at both institutions were used for the calculations.

Precautions Taken for Accuracy

All instructors who administered the TSCS met two weeks before the test was given for instruction in the administration of the TSCS. Written instructions (Appendix C) were given to the instructors to aid them in the administration of the TSCS. The testers answered questions students had about the testing procedure during the testing. Although students were asked to complete all information requested, some chose not to comply. The researcher checked each set of forms to be certain there were matching identification numbers. Each set of class materials was kept separately in manila envelopes.

Each TSCS was partially hand scored by the researcher and two trained assistants. The column, row and total positive scores were calculated by the UNR mainframe computer after the data was entered. The program for this was written by a statistician employed by the UNR computing center. Twenty-five randomly selected answer sheets were chosen from tests scored by each of the scorers. These tests were rescored to determine if error had occurred during the scoring process. One research assistant had two errors in 400 scoring opportunities. The other research assistant had one error in 400 scoring opportunities. All of their errors were on forms that were difficult to read due to carbon over writing or use of felt-tipped pens on the answer sheet causing light marking on the score sheet. When the researcher's tests were rescored it was determined that she had made many errors and those tests should be rescored. All of the researcher's tests were rescored by the researcher and the two trained assistants. When checked after rescoring no errors were detected.

The TSCS variable scores and demographic data were entered into the UNR mainframe computer by a professional data entry person. Data entry was verified by the data entry person at the time of entry. Fifty sets of materials were randomly selected by the researcher and checked for accuracy. Of the 11,000 character entries, sixteen errors were detected and corrected. This 99.5% correct ratio was acceptable to the researcher and no further checks were made of the data. Data was transferred to Montana State University's (MSU) mainframe computer via two International Business Machines (IBM) floppy discs. Accuracy of the transfer was confirmed by comparing two massive SPSS programs that had

been run at UNR and then run at MSU. The statistics were identical for both programs. It was then assumed by the researcher that the data transfer was complete and accurate.

Summary

The subjects for this study were all female students enrolled in racquetball, rhythmic aerobics, and selected control classes at UNR during the fall semester of 1984 who agreed to participate. Ninety-nine percent of all students present at the testing agreed to participate in the study. Female students were studied due to the small number of males enrolled in rhythmic aerobics.

The design of the study was quasi-experimental using intact classes. During the semester the subjects participated in their normal class activities except for the two days that testing occurred. The first administration of the TSCS was during the second week of the semester and the posttest was administered the fourteenth week of the semester. The TSCS was administered by the researcher, a trained research assistant and three of the class instructors. The researcher collected the data and had it partially hand scored, entered into the mainframe computer and then totals were calculated. Statistics were calculated at UNR using the mainframe computer and SPSS release eight statistical package. Data was transferred to MSU and further statistical analysis was done using the mainframe computer and SPSS release nine. Precautions taken for accuracy included checking of hand scoring, data entry and data transfer.

CHAPTER IV

RESULTS

Introduction

In the first three chapters the researcher presented the problem to be studied, need for the study, a review of the literature and the methods used to conduct the study. In this chapter, the analysis of the data collected for the study will be presented in the following manner: (a) the hypothesis being examined; (b) tables presenting the results of the analysis of variance (ANOVA) or analysis of covariance (ANCOVA) depending on which statistical procedure was used to analyze the hypothesis being explained; and (c) a brief discussion about the implications the results have on the study and if the results affect the analysis of the other hypotheses.

Since an understanding of the Tennessee Self-Concept Scale (TSCS) is critical to interpreting the results of the study a review of the instrument will be presented. The TSCS is composed of six columns and three rows forming a matrix. Five of the columns and all the rows contribute to the Total Positive, general, self-concept score. The columns are A, B, C, D, and E on the score sheet and represent physical, moral-ethical, personal, family, and social self-concept respectively. The rows are 1, 2, and 3, representing identity, self-satisfaction and behavior. The column scores reflect how the person feels he or she is perceived by others. The row scores reflect how the individual perceives himself or herself. The sixth column, self-criticism, is used

by counselors to aid in the interpretation of an individual client's scores. The self-criticism scores are reported in this study as a part of the test; the self-criticism scores will not be addressed by the researcher unless interpretation of the self-criticism score would aid in the analysis of other sections of the TSCS. The single most important score is the Total Positive score, for it is the score which is the composite of the subscales and represents the complete self-concept score.

Hypothesis 1

H1: There will be no significant difference in pretest self-concept scores of female UNR students during the fall of 1984 among the racquetball, rhythmic aerobics, and control groups.

Table 6 presents the results of the oneway ANOVA for all subscales and the Total Positive scores among the racquetball, rhythmic aerobic and control groups. All the calculated F-ratios were below the F-value of 3.01 required to be significant at the .05 level of confidence. Based upon these results null hypothesis H1 was retained. There was no significant difference among the two experimental groups and the control group in self-concept at the beginning of the testing period.

Discussion

The results reported in Table 6 were expected by the researcher and indicated that the selection of the control group was appropriate. Since determining the effect of the activity classes on self-concept during the semester was the objective of the study, it was important that the groups not be different at the beginning of the study.

Table 6. Oneway ANOVA Pretest Scores for Racquetball, Rhythmic Aerobics and Control

	Sum Squares	Mean Squares	Mean GRP1	Mean GRP2	Mean GRP3	Mean Total	F-Ratio	p
Self Criticism			35.86	36.12	35.66	35.91	.362	.6965
Between	21.01	10.50						
Within	13956.99	29.02						
Total	13978.00							
Physical			67.61	66.42	68.07	7.4	2.197	.1123
Between	277.51	138.76						
Within	30384.39	63.17						
Total	30661.90							
Moral-Ethical			72.67	70.79	71.50	71.40	1.828	.1619
Between	232.86	116.43						
Within	30639.38	63.70						
Total	30872.24							
Personal			68.29	67.26	67.18	67.43	.757	.4698
Between	85.43	42.71						
Within	27153.32	56.45						
Total	27238.75							
Family			72.51	71.71	71.07	71.64	.951	.3870
Between	126.64	63.32						
Within	32019.08	66.57						
Total	32145.73							
Social			70.53	70.42	69.85	70.24	.332	.7180
Between	41.34	20.67						
Within	29981.38	62.33						
Total	30022.72							
Identity			127.16	126.66	126.80	126.80	.094	.9107
Between	16.63	8.32						
Within	42771.72	88.92						
Total	42788.35							
Satisfaction			110.89	108.33	108.58	108.91	1.055	.3489
Between	458.91	229.45						
Within	104589.09	217.44						
Total	105048.00							
Behavior			113.55	111.62	112.28	112.22	.939	.3917
Between	244.29	122.14						
Within	62553.62	130.05						
Total	62797.90							
Total Self			351.60	346.61	347.64	347.93	.837	.4337
Between	1656.30	828.15						
Within	475950.17	989.50						
Total	477606.47							

Number	Degrees of Freedom	F-Value
GRP1 93	Between 2	3.01
GRP2 222	Within 481	
GRP3 169		

Total 484 Total 483

GRP1= Racquetball

GRP2= Rhythmic Aerobics

GRP3= Control

