THE RELATIONSHIP BETWEEN PHYSICAL FITNESS AND ITS EFFECTS ON SELF-CONCEPT AND ANXIETY AMONG FIFTH GRADE STUDENTS

By

STEVE LYNN LOHMANN

Bachelor of Science
Northwestern Oklahoma State University
Alva, Oklahoma
1978

Master of Education
Northwestern Oklahoma State University
Alva, Oklahoma
1981

Submitted to the Faculty of the Graduate College
of the Oklahoma State University
in partial fulfillment of the requirements
for the Degree of
DOCTOR OF EDUCATION
December, 1993

OKLAHOMA STATE UNIVERSITY

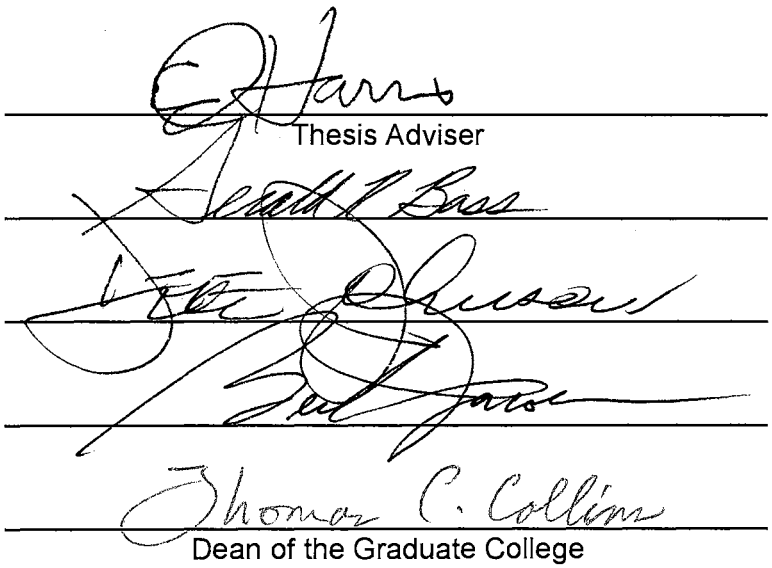
THE RELATIONSHIP BETWEEN PHYSICAL FITNESS

AND ITS EFFECTS ON SELF-CONCEPT

AND ANXIETY AMONG FIFTH

GRADE STUDENTS

Thesis Approved:



Thesis Adviser

Dean of the Graduate College

ACKNOWLEDGMENTS

I would like to express my deepest appreciation to my chairperson, Dr. Gerald Bass, for his encouragement and guidance, and Dr. Ed Harris, dissertation adviser, for his invaluable patience and guidance in the course of this research and throughout my career at Oklahoma State University. I also wish to thank my committee members: Dr. Bert Jacobson and Dr. Deke Johnson, for their support and advisement.

I extend my thanks to Amber Howerton and Lee Ann Cloyd, both of whom assisted in typing the drafts of this dissertation; to Dr. Gwen Benson and Dr. Nancy Knous, for their assistance in reviewing key areas of this study; to Dr. Randy Smith, Sue Dippel, and Delbo Leach, for their unending encouragement while I completed this project; to Dr. Yvonne Carmichael, Department Chairman, and Dr. Joe Struckle, President of Northwestern Oklahoma State University, for their support and recognition of the time required to complete this degree.

I am especially grateful for my wife, Kim and my son, Derek, who exhibited constant patience and confidence in me during the past two years. Finally, I wish to dedicate this study to my mother, Hazel Lohmann, who has fought a continuous battle with cancer and has remained a cornerstone in our family and an inspiration to me.

TABLE OF CONTENTS

Chapter		Page
I.	INTRODUCTION	1
	Statement of the Problem	4
	Hypotheses	5
	Significance of Investigation	6
	Purpose of Investigation	7
	Scope	8
	Definition of Terms	8
	Limitations	9
	Delimitations	9
	Assumptions	10
	Overview	10
II.	REVIEW OF LITERATURE	11
	Physical Fitness and Self-Concept	11
	Physical Fitness and Anxiety	19
	Overview of Piers-Harris Children's Self-Concept Scale	24
	Summary of Literature Review	26
III.	PROCEDURES	28
	Introduction	28
	Description of Subjects	28
	Sampling	29
	Instrumentation	29
	Data-Gathering Techniques	32
	Data Analyses	33
	Design of Study	33
	Summary	34
IV.	ANALYSES OF DATA	36
	Introduction	36
	Relationship Between Physical Fitness and Self-Concept	36
	Relationship Between Physical Fitness and Anxiety	38
	Comparing Pre-Test and Post-Test Self-Concept Scores	39
	Comparing Pre-Test and Post-Test Anxiety Scores	41
	Comparing Post-Test Self-Concept Means Between Groups	42
	Comparing Post-Test Anxiety Means Between Groups	42

Chapter Page

Comparing Gender and Self-Concept 43
Comparing Gender and Anxiety 44
Results as Related to Hypotheses 1-4 46

V. DISCUSSION 49

Introduction 49
Summary 49
Findings 51
Conclusions 54
Recommendations for Further Research 55
Recommendations for Practice 56
Final Statement 58

REFERENCES 59

APPENDIXES 64

APPENDIX A - QUESTIONNAIRE: THE WAY I FEEL ABOUT MYSELF 65

APPENDIX B - ANXIETY SUBTEST 71

APPENDIX C - TABLE: SCHOOL-AGE NORMS 73

APPENDIX D - TABLE: RELIABILITY DATA 75

APPENDIX E - PARENTAL CONSENT FORM 77

APPENDIX F - PRESIDENT'S CHALLENGE FITNESS TEST 79

LIST OF TABLES

Table		Page
I.	Means and Standard Deviations for Physical Fitness and Self-Concept	37
II.	Pearson Correlation: Correlation and Coefficients of Determinations Between Physical Fitness and Self-Concept	38
III.	Means and Standard Deviations for Physical Fitness and Anxiety.....	39
IV.	Pearson Correlation: Correlation and Coefficients of Determinations Between Physical Fitness and Anxiety	40
V.	Means, Standard Deviations, and Comparison of Pre-Test and Post-Test Scores on Self-Concept for Improvement and Comparison Groups	40
VI.	Means, Standard Deviations, and Comparisons of Pre-Test and Post-Test Scores on Anxiety Levels for Improvement and Comparison Groups	41
VII.	Analysis of Covariance: Comparison Between Groups on Post-Test Self-Concept Scores	43
VIII.	Analysis of Covariance: Comparison Between Groups on Post-Test Anxiety Scores	44
IX.	Two-Way Analysis of Variance: Comparing Effects of Gender and Pre-Test and Post-Test Self-Concept Scores on Overall Self-Concept	45
X.	Two-Way Analysis of Variance: Comparing Effects of Gender and Pre-Test and Post-Test Anxiety Scores on Overall Anxiety	46
XI.	School-Age Norms (Grades 4 Through 12)	74
X.	Reliability Data	76

CHAPTER I

INTRODUCTION

The relationship of physical fitness and a child's overall wellness began as early as 388 B.C. During this era the Greek philosopher Plato stated, "In matters of health and disease and virtue and vise, no symmetry is more basic than that between soul and body. . . . To get proper symmetry of body and soul one must exercise both" (cited in O'Brian, 1946, p.62). Similar research examining the interaction between mind and body began with Hippocrates, who developed a doctrine relating physique and temperament (Tillman, 1965). In the early part of the twentieth century, Cooley (1922) aroused interest in self theory and helped pave the way for researchers examining the relationship between the physical and psychological aspects of the self.

During the past 25 years there have been several studies pertaining to physical fitness and the physiological and psychological benefits derived from it. Although these studies supported the physiological benefits of physical fitness (Cooper, 1982; Pollock, 1974; Presidents Council on Physical Fitness and Sports, 1971), the studies concerning the psychological benefits derived from physical fitness tend to be mixed. In 1969, Christian conducted a study concerning the relationship between physical fitness and self-concept utilizing 189 male college students, and found no significant relationships between the two variables. However, in a later study conducted in 1977, Leonardson found a significant correlation between self-concept and the perceived fitness of 165 high school students.

In addressing the topic of physical activity and the emotional development of a child, Oliver (1960) suggested that in the course of development a child learns much

about him/herself. This self-awareness changes as the child develops confidence and courage and also changes according to success and failure. Success enhances a child's self-concept and thus leads the child to seek activities in which this result can be found and avoids activities in which failure is likely. Oliver generalized that children with a poor self-concept exhibit higher levels of anxiety, are more tense, and are less well-adjusted than those with a positive self-concept.

During the 1970's, additional research studies were designed to investigate the effects of physical fitness activities on personality variables. Collingwood and Willett (1971) reported that teenage males who participated in a three-week jogging and swimming program exhibited positive changes in self attitudes. Hilyer and Mitchell (1979) reported that college students who participated in a fitness running program showed a significant gain in self-concept. In their research, Hilyer and Mitchell found that the greatest change occurred in students who initially had low self-concepts, while those students with initially high self-concepts showed minimal change.

In their discussion of self-concept, Calhoun and Morse (1977) defined the term as the description one employs to identify her/his nature and also uses to compare her/himself to others. They added that the development of a positive self-concept can be highly correlated to the amount of success one experiences in the developing years. Those who have very limited opportunities to experience success will tend to develop a poor self-concept.

Thomas, Thomas, and Lee (1988) viewed self-concept as being situationally specific. Their concern was the manner in which children actually perceived themselves in physical activity and whether physical fitness can positively influence self-concept.

With the increased societal involvement in physical fitness in recent years and interest in the relationship of physical fitness to reduction in stress and anxiety, researchers have been investigating direct associations between physical exercise and

improvements in psychological functioning. In 1971, the President's Council on Physical Fitness and Sports published a report that reviewed the relationship between psychological and physiological traits. The report stressed that people who are physically fit are more optimistic, energetic, and action-minded compared to individuals who are not physically fit. Furthermore, physically fit individuals were reported to be less nervous and tense; and were also more secure, playful, independent, and emotionally mature than unfit individuals (President's Council on Physical Fitness and Sports, 1971). At a workshop sponsored by the National Institute of Mental Health concerning the relationship between exercise and mental health, Morgan (1984) reported that the participants developed the following consensus statements on the benefits of physical exercise as related to anxiety.

1. Physical fitness is positively associated with mental health and well-being.

2. Exercise is associated with the reduction of stress emotions such as state anxiety. Wood (1977) defined state anxiety as an empirical process of reaction taking place at a particular moment in time and at a given level of intensity.

3. Anxiety and depression are common symptoms of failure to cope with mental stress, and exercise has been associated with a decreased level of mild to moderate depression and anxiety.

4. Long-term exercise is usually associated with reductions in traits such as neuroticism and anxiety.

5. Appropriate exercise results in reduction of various stress indices such as neuromuscular tension, resting heart rate, and some stress hormones.

6. Current clinical opinion holds that exercise has beneficial emotional effects across all ages and in both sexes (Morgan, 1984).

Although these statements offer support for the claim that physical exercise can have positive effects, psychologically as well as physically, Ben-Schlomo and Short,

(1983) concluded that these changes are more consistent for rehabilitation groups than for individuals with no disabilities. They reported:

> While participation in exercise programs resulting in improved physical fitness has been shown to positively affect self-attitude measures of individuals with physical, emotional, and mental disabilities, results of studies using normal, non-rehabilitation subjects have been contradictory and inconclusive (p. 19).

Other research concerning mental health, self-concept, and anxiety has also involved high school or college students. Additional experimental research investigating the relationship between physical fitness and the psychological effects on elementary school children may be warranted.

Statement of the Problem

During the 1991-92 school year, 1,555 elementary and secondary schools in Oklahoma (out of a possible 1,880) offered physical education as a part of the curriculum (Oklahoma State Department of Education, 1992). If schools in today's society are the means of giving all children experiences that will help them fully develop, should physical education and fitness be an integral part of each child's daily routine? Many educators believe that physical education and fitness play a vital role in the development of children (Oglesby, 1987; Pangrazi, 1982; Thomas, Thomas, & Lee, 1988). By these standards, children in 325 Oklahoma schools are being denied the opportunity to develop their potential. Moreover, if physical fitness is important to the overall physical, social, emotional, and intellectual growth, there could be retarded development in the self-concept of students not participating in daily physical education and fitness programs. The problem of this study may be clarified by asking the following questions.

1. Is there a relationship between the physical fitness levels of a non-disabled fifth grade child and self-concept?

2. Does improvement in the fitness level of a non-disabled fifth grade child bring about a significant change in self-concept?

The purpose of this study was to examine non-disabled fifth graders who participated in the President's Challenge Physical Fitness Test to determine the existence of a correlation between one's physical fitness level and one's self-concept and anxiety level. A secondary purpose was to determine if non-disabled fifth graders who improved their fitness level between the pre-test and post-test also exhibited a significant change in their overall self-concept and anxiety levels.

Hypotheses

The null hypotheses were utilized with regard to each variable. The null hypotheses are:

1. There will be no significant relationship between non-disabled fifth grade children's physical fitness levels and their self-concepts.

2. There will be no significant relationship between non-disabled fifth grade children's physical fitness and their anxiety levels.

3. There will be no significant difference in the self-concept of those non-disabled fifth grade students who exhibit improvement in their physical fitness levels during the school year and those who do not.

4. There will be no significant differences in the anxiety levels of those non-disabled fifth grade students who exhibit improvement in their physical fitness levels and those who do not.

In order to assess whether or not there was a significant relationship between the independent variable (physical fitness) and the two dependent variables (self-concept and anxiety), the Pearson product-moment correlation was performed for the first two null hypotheses. In addition, for the second part of this study a one-way analysis of covariance was performed separately to determine whether or not a

significant difference existed between the adjusted group mean scores of the improvement group (those students who exhibited improvement in fitness levels) and the comparison group (those students who did not exhibit improvement in their fitness levels) for each of the two dependent variables. The significance level was set at .05 for the analysis of covariance.

Significance of Investigation

Human beings are created with a natural urge for physical activity (Croce & Lavay, 1985). Physiologically, the benefits of exercise are numerous. Some of the proven benefits include strengthening of the cardiovascular system, increased resistance to illness, improved strength and muscle tone, and a decrease in insomnia (Carlson & Ardell, 1981). The benefits, however, are not restricted to the physical domain. Research has also focused on the relationship between physical activity and emotional characteristics. This study investigated how physical fitness has had an impact on self-concept, stress and anxiety, and an overall feeling of well-being.

In the course of growing up, a child learns not only about people and objects in the world but also about her/himself. The development of self-concept is a growth process that begins early in a child's life and develops through social interaction with people and interaction with the environment. According to Oliver (1960), children with a poor self-concept tend to experience higher anxiety and are not as well-adjusted as children with a good self-concept.

Research has not been conclusive in regard to the relationship between physical fitness and a non-disabled child's self-concept and anxiety level. Although there is research in this area, much of the research has not focused on non-disabled elementary age children.

This study was important for a number of reasons. First, the study adds to the literature on the effects of physical fitness among non-disabled children between the

ages of 9 and 11. Second, the study may contribute to the resolution of the contradictory results of studies using subjects with no disabilities to examine changes in self attitudes after physical fitness activities. Third, the study may offer ways of facilitating improvement in self-concept among non-clinical populations. Finally, if it can be demonstrated that a child's fitness level does contribute positively to self-concept and does help students cope with anxiety, perhaps more schools will consider making physical fitness a part of the daily program.

Purpose of Investigation

The fundamental purpose of this study was to ascertain whether selected non-disabled fifth grade children's fitness levels correlated with their self-concepts and anxiety levels as measured by the Piers-Harris Children's Self-Concept Scale. The study was specifically concerned with:

1. Determining whether a positive correlation exists between the level of fitness and self-concept of those non-disabled fifth grade students who participated in the President's Challenge Fitness Test.

2. Determining whether a negative correlation exists between the level of fitness and level of anxiety of those who participated in the President's Challenge Fitness Test.

3. Determining whether those non-disabled fifth grade students who scored higher on the second President's Challenge Fitness Test administered during the second semester also showed a positive change in self-concept as compared to those students who did not improve their scores on the fitness test.

4. Determining whether those non-disabled fifth grade students who scored higher on the second President's Challenge Fitness Test administered during the second semester also exhibited lower levels of anxiety than those students who did not improve their scores on the fitness test.

Scope

The scope of this study was:

1. To study only the following characteristics: physiological, anxiety level, and self-concept.

2. To study only those non-disabled fifth grade students who participated in the President's Challenge Fitness Test at a rural elementary school in northwest Oklahoma. Only those students who received parental/guardian consent were involved in the study.

3. To determine whether a relationship existed between the child's physical fitness levels and self-concept and anxiety levels.

4. To determine if a significant change in self-concept and anxiety levels resulted from improvement in fitness level as determined by the President's Challenge Fitness Test.

Definition of Terms

For the purposes of this study, terms that were important for its understanding are defined as follows:

Anxiety: A feeling or emotion dominated by apprehension even though the nature or causes of danger are unknown (Taylor, 1953).

Motor Fitness: Concerned with the following elements of physical fitness: strength, speed, agility, endurance, power, coordination, balance, flexibility, and body control (deVires, 1986).

Physical Education: The knowledge and experiences the school provides for the purpose of enhancing motor, intellectual, social, and physical development of individuals through the means of body movement (Tenoschok, 1984).

Physical Fitness: The combination of motor fitness and physical working capacity as measured by the President's Challenge Fitness Test.

Physical Activity: The time spent by subjects in aerobic activity (jogging, swimming, biking, etc.) and time spent in non-aerobic physical activity (weightlifting, stretching, pushups, sit-ups, etc.).

Physical Working Capacity A measure of aerobic power (deVires, 1986).

Self-Concept: Children's view of themselves (Thomas, Thomas, & Lee, 1988). (In this study, the terms "self-awareness" and "self-concept" were used interchangeably.)

State Anxiety: An empirical process of reaction taking place at a particular moment in time and at a given level of intensity (Wood, 1977).

Piers-Harris Children's Self-Concept Scale: A scale designed primarily for research on the development of children's self attitudes and the correlates of these attitudes.

The President's Challenge: An awards program that recognizes and motivates students ages 6-17 to meet challenging goals for cardiorespiratory and muscular endurance, muscular strength, flexibility, and agility.

Limitations

The following limitations of this study should be noted.

1. Pre-test, post-test sensitization could be a factor and could affect the results.
2. Since random selection was not used, the findings of this study may not be generalizable to any other school but may be transferable.
3. The subjects' knowledge of their fitness results could be a threat to the validity of the study.

Delimitations

The delimitations of this study were as follows:

1. The subjects involved in the study were only those 73 non-disabled students in the fifth grade who were granted parental/guardian permission and who participated in the President's Challenge Fitness Test at a rural elementary school in northwest Oklahoma.

2. The Presidents Challenge Physical Fitness Test was used to assess the physical fitness levels of the subjects.

3. The Piers-Harris Children's Self Concept Scale was used to determine the self-concept levels and anxiety levels of the subjects.

Assumptions

The following assumptions of the study should be noted.

1. During the fitness testing of the subjects it was assumed that all subjects were highly motivated and gave their best effort.

2. During the administration of the Piers-Harris it was assumed that all subjects answered all of the questions honestly.

Overview

The remaining chapters are arranged as follows: Chapter II presents an analyses of the literature relating physical activity to self-concept and anxiety. Chapter III contains a description of the methods and procedures utilized in the study, including subjects, sampling procedure, research instrumentation, data-gathering techniques, and an explanation of how the data were analyzed. In Chapter IV the results of the data analyses are presented. Chapter V concludes the study and provides a summary, an explanation of the results, implications for further research, and conclusions.

CHAPTER II

REVIEW OF LITERATURE

The review of literature is presented in three sections. The first section, physical fitness and self-concept, begins with a view of positions and opinions on physical fitness and on self-concept and then proceeds with a review of studies relating physical fitness and self-concept. The second section on physical fitness and anxiety is organized in a similar manner. The final section reviews literature related to the Piers-Harris Children's Self-Concept Scale.

Physical Fitness and Self-Concept

Various authors such as Martens (1975), Hellison (1973), and Pangrazi (1982) have defined self-concept and explained its relationship to physical fitness. Martens described self-concept as a system of conceptions about oneself and as an attitude similar to other attitudes with cognitive, affective, and behavioral components. The cognitive component includes the various categories used to describe oneself. For example, children may describe themselves as being fast, smart, heavy, gregarious, and so on. The affective component pertains to the individual's self-esteem and refers to the child's feelings about self. Finally, the behavioral component refers to the various ways one may act toward oneself. Martens proposed that a child's attitude about self is probably the most important in a myriad of attitudes. He wrote that self attitude is important because it influences an individual's goals and behavior in reaching those goals. Through his research, Martens found that physical education activity (including fitness programs) influence one's self-concept. However, it should be

noted that Martens attributed such influences to other factors as well, including teacher approval, praise, and body image as having a similar, if not greater, influence on the development of self-concept.

Martens' (1975) position on the importance of self attitude was supported by Combs (1965), who suggested that people discover their self-concepts from the kinds of experiences they have with life. Combs also noted that people develop feelings that they are liked, wanted, accepted, and able, from having been successful.

Pangrazi (1982) proposed that children who possess positive feelings about themselves have a priceless commodity and this, in turn, increases opportunities for personal growth. He stated that most people who deal with self-concept agree that a sense of self-worth, a sense of personal competence and a feeling of belonging are important parts of an individual's development. Pangrazi suggested that physical education can enhance these feelings by providing experiences and fitness activities that will contribute to the individual's development. He offered the following suggestions for aiding students in developing a positive self-concept in physical education and fitness activities.

1. Students should be provided direction in realistically evaluating abilities. This places an emphasis on comparison with past performances and setting goals for improvement.

2. Students should be allowed to progress at their own individual rates.

3. Physical fitness should be emphasized to the students. Although they may not possess high skill levels in other areas, all students can improve their fitness levels.

4. Students should be taught how to praise themselves and others. By praising other students, they are more likely to praise themselves.

5. Physical education instructors need to expect students to succeed (Pangrazi, 1982).

The Pangrazi (1982) suggestion about instructor expectation is supported by a study performed by Martinek and Johnson (1979), who found that school-age students who were expected to be low achievers did not receive the same encouragement as those students who were expected to be high achievers.

Hellison (1973) addressed the topic of physical fitness and self-esteem by suggesting that physical education deserves special consideration when it comes to the development of self-esteem in young children. He stated the following:

> Although many programs other than physical education can also alter an individual's self-esteem, there are at least three reasons for suggesting that physical education should receive special consideration in any discussion of self-esteem change. First, the American culture has traditionally extolled the value of physical prowess, fitness, and appearance. . . . Second, perceptions of the body and self-perceptions parallel each other according to experimental evidence, as well as theoretical propositions. . . . And third, physical education has a highly visible affective dimension (p. 11).

Studies of Physical Fitness and Self-Concept

Various studies have been conducted dealing with the relationship between physical fitness and the psychological well-being or self-concept of individuals. Few of these studies have pertained specifically to elementary students. Some of the results of these studies have shown significant relationships while others have not. Those studies showing a significant relationship include a study by Tillman (1965), who conducted a correlation study comparing 63 junior high and high school males who exhibited high levels of physical fitness, and 50 males who exhibited low levels of physical fitness on the A-S Reaction Study of Allport, Cattell's 16 Personality Factor Questionnaire, and the Kuder Preference Record. Tillman found differences between the personality traits of the two fitness groups. He reported that the physically fit boys were more socially oriented, exhibited more dominance, and were more outgoing than the boys from the low fitness group.

Collingwood and Willett (1971) used five obese adolescent boys as subjects in a study that examined the effects of a physical training program on self-concept and body image. The boys participated in a three-week program consisting of 30 hours of physical training. The Bill's Index of Adjustment and Values (IAV) and a short form of the Body-Attitude Scale were used as instruments in the study. The results showed that the boys experienced a significant improvement in self-concept and body image after participation in the program.

Collingwood (1972) examined the changes in self attitude of 25 matched pairs of male rehabilitation clients. The IAV and the Body-Attitude Scale were again employed. Also included in the evaluation process were the subjects' counselors who were asked to rate their clients' behavioral changes in the classroom. Subjects were randomly assigned to a control group and an experimental group. The experimental group participated in a fitness program of jogging, agility drills, and calisthenics five days a week for four weeks. Collingwood reported significant differences between groups on the IAV, the Body-Attitude Scale, and the ratings from subjects' counselors, with the experimental group exhibiting greater positive change because of the fitness program.

Sharp and Reilly (1975) correlated measures of physical fitness with selected scales on the Minnesota Multiphasic Personality Inventory (MMPI). The subjects for the study included 65 male college students. Sharp and Reilly reported that aerobic fitness correlated positively with the more favorable scales on the MMPI and negatively with the less favorable scales. Their analysis of changes in physical fitness scores and changes in personality scores indicated that subjects who initially scored high on the fitness tests gained most psychologically but the least physically and, conversely, those subjects who scored the lowest on the fitness tests gained the most physically but the least psychologically.

Leonardson (1977) investigated the perceived fitness and self-concept of 165 high school students. Using the Piers-Harris Children's Self-Concept Scale, he found a significant correlation. Additional research by Leonardson and Gargivlo (1978) using 33 college freshmen, supported the correlation between perceived physical fitness and self-concept. To assess self-concept, a 44-item semantic differential rating scale with a test-retest reliability of .82 was utilized.

Jorgenson and Jorgenson (1979) examined the perceived emotional well-being of 454 subjects who ran an average of 22 miles per week. The subjects were asked to respond to a questionnaire designed to measure the perceived emotional well-being of the subjects. The authors reported that 92% of the subjects perceived increased emotional well-being as a result of running.

In a 10-week study using 120 college students as subjects, Hilyer and Mitchell (1979) examined the effects of a physical fitness jogging program on self-concept as measured by the Tennessee Self-Concept Scale (TSCS). The subjects were randomly assigned to one of three groups: (1) an experimental group participating in running only; (2) an experimental group participating in running and also receiving counseling; and (3) a control group. The authors reported a significant difference in mean gain scores of self-concept among low self-concept students according to treatment. The largest changes of self-concept were reported among low self-concept students in the running groups.

Percy, Dziuben, and Martin (1980) conducted a study with fifth and sixth graders analyzing the effects of distance running one to three miles for a period of seven weeks. They reported a positive change in self-concept as measured by the Coppersmith Self-Esteem Inventory. Bradfield et al. (1981) initiated a daily running program in which an entire school of 450 students participated. They reported that as a result of the program, students exhibited improved physical health, an increase in self-esteem, and a decrease in behavior problems, as observed by teachers and staff.

McGowan, Jarman, and Pederson (1974) conducted a study pertaining to the effects of an endurance training program on the self-concept of 37 seventh-grade males with low self-esteem. The subjects were assigned either to an experimental group that participated in an 18-week running program or to a control group. The authors reported a significant increase occurred in self-concept from pre-test to post-test for the experimental group.

Jasnoski and Holmes (1981) examined the effects of an aerobic fitness program on 103 female college students in order to determine whether initial levels of fitness were related to differences in personality. The women participated in one-hour aerobic fitness sessions twice weekly for 15 weeks. Included in the sessions were 15 minutes of warm-up stretches; 30 minutes of dancing, running, or jumping rope; and 15 minutes of cool down. The instruments employed to assess personality variables were the 16 Personality Factor Questionnaire, the Self Rating Depression Scale, and the Type A Personality Survey. The authors found that initial levels of fitness were related to increased self-assurance, greater emotional stability, and less pretentiousness. Jasnowski and Holmes concluded that simply participating in the aerobic program was related to increased self-assurance, increased imagination, decreased inhibition, and decreased behaviors of the coronary prone, or type A, personality. Furthermore, they reported that improvements in fitness were related to increased self-assurance, increased liberalness, and decreased tension.

A study comparing the self-concepts of third, fourth, and fifth grade students who ranked in the highest and lowest groupings on a measure of physical fitness was conducted by Behrman (1985). All third and fourth grade students from a metropolitan school system in Georgia were required to participate in a 600-yard walk/run as a part of their physical fitness class. Students were ranked by grade level according to the time it took them to complete the course. The Piers-Harris Children's Self-Concept Scale was administered to those students, who ranked in the top 15% and the bottom

15%. Their results showed that a significant difference existed between self-concept scores of third and fourth grade students who ranked in the highest group on the physical fitness measure and the students who ranked in the lower groups.

Using 15 female volunteers, Ben-Schlomo and Short (1986) conducted a cause and effect study to determine if physical conditioning improved the self-concept and body satisfaction of volunteers as measured by the Tennessee Self-Concept Scale (TSCS) and the Body-Cathexis Scale. The subjects were randomly assigned to either an arm training group, a leg training group, or a control group. The conditioning groups exercised for six weeks on cycle ergometers while the control group did not participate in any type of exercise. The authors reported a difference between the groups with the greatest psychological gains most apparent in the females who were initially physical unfit. From their findings, they suggested that participation in aerobic conditioning had psychological benefits for women.

Studies that do not support a significant correlation or cause and effect relationship were also reported. For example, Johnson (1969) investigated the relationships among self-concepts, movement concepts, and physical fitness. He further determined the effects of a physical conditioning program and a sports skill program upon self-concept and movement concept. Seventy-three male freshmen were randomly assigned to three groups: one experimental group participated in a sports skill program; a second experimental group participated in a physical conditioning program; and the third group was the control group. The Q-sorts was used for determining self-concept and movement concept. Johnson reported a significant relationship between self-concept and movement concept but found no significant relationship between self-concept and physical fitness or movement concept and physical fitness. Christian (1969) performed a six-week study to determine the relationship between physical fitness and self-concept in 189 male college students. He focused his study on three areas: (1) determining the relationship between initial

measurements in physical fitness and self-concept, (2) looking for corresponding change in self-concept and increased fitness levels, and (3) identifying the role of knowledge of improvement in fitness on the change in self-concept. Christian used three groups in the study: (1) a control group receiving only archery instruction, (2) a fitness training group with knowledge of their progress, and (3) a group receiving the same treatment as group 2 but without progress reports. The instruments employed in the study were the TSCS and a battery of four physical efficiency tests. Christian reported no significant relationships between self-concept and physical fitness and further concluded that improvement of the selected aspects of physical fitness among male college students did not result in a changed self-concept for either those knowing the results of improvement or those not knowing. An inverse relationship was found in the Sonstroem and Metz (1969) study examining the physical and psychological fitness of 165 male adolescents. In this study, no significant relationship between the boys' self-esteem and physical fitness was found.

Hulecki (1988) designed a study to determine the relationship between increased physical activity and learning disabled students' self-concept. The subjects were 34 learning disabled students with an average age of 14 years, 7 months. Hulecki employed a control group and an experimental group. The experimental group's class schedule provided them with a period to participate in aerobic-type physical education classes for a six-week period. The control group remained in study hall during the same time. Using the Piers-Harris Children's Self-Concept Scale, she found no significant difference between the self-concept of the experimental and the control groups.

Summary of Physical Fitness and Self-Concept

Research investigating the relationship between physical fitness and self-concept has arrived at contrasting results. Although findings from most authors and

studies reviewed supported the relationship between physical fitness and self-concept (Behrman, 1985; Cooper, 1982; Leonardson, 1977), other studies did not (Christian, 1969; & Hulecki, 1988; Johnson, 1969). Favorable studies reported that individuals who were in poor physical and/or psychological condition exhibited more improvement as a result of physical fitness activities or programs. It should be noted that the majority of such studies were focused on the teenage, college, and/or handicapped populations with a limited number of studies devoted to non-disabled elementary school students. Although the studies were directed at the effects of physical fitness on overall self-concept, other research has been used to examine some of the individual factors which make up self-concept, including anxiety and stress, each of which is addressed in the following sections.

Physical Fitness and Anxiety

Wilmore (1986) described anxiety as an undesirable psychological state that has reached pandemic proportions in recent years. He defined anxiety as:

> A vague feeling of nervousness, apprehension, and uncertainty that is similar to the feelings associated with a specific cause or threat, but can produce confusion, and distorted perceptions of time and space, and distortion of motivation and meanings of events (p. 33).

As for the relationship between physical fitness level and anxiety, Wilmore suggested that people who suffer from anxiety usually exhibit low levels of fitness.

Wood (1977) reported that before attempting to investigate the relationship between anxiety and physical activity one should understand that anxiety behavior may be divided into two dimensions. These two dimensions are: state anxiety and trait anxiety. In defining the two terms, Wood stated that:

> State anxiety is a transitory emotional state or condition of the human organism that is characterized by feelings of apprehension and automatic arousal while trait anxiety refers to a 'tendency' to respond to situations perceived as threatening with elevations in a state intensity (p. 67).

In a study pertaining to exercise and anxiety, DeWolf (1991) suggested that researchers commonly use trait anxiety measures in assessing the effects of chronic exercise and state anxiety measures in assessing the effects of acute exercise.

A large number of people have been reported to suffer from anxiety, stress, and depression. The search for viable treatments for these disorders continues; however, some of the most often used treatments in the past have included psychotherapy and medication (Morris & Beck, 1972). However, Cooper (1982) noted that in recent years several psychiatrists had begun to use aerobic exercise as a physiological tranquilizer and as a means for relieving some types of stress and emotional anxiety. Handly (1985) supported Cooper's view by comparing physical fitness to a "giant eraser" capable of relieving a person of anxiety and stress. While noting that any type of regular exercise routine will provide benefits for individuals, Handly suggested that anxious people should participate in aerobic exercise. Handly also proposed that, by combining physical exercise along with relaxation techniques even people who suffer from severe anxiety attacks can learn to cope with their anxiety. Swede and Seymour (1987) contributed further to those opinions when they proposed that exercise and improvement in one's fitness level plays a key role in a person's ability to control anxiety and stress. They included exercise as a part of their seven-step program to control anxiety. It should be noted that, besides exercise, Swede and Seymour's program includes diet, relaxation, attitude, imagination, social support, and spiritual value.

Thomas, Thomas, and Lee (1988) suggested that anxiety and stress are specific to different situations. For example, they noted that situations that might raise a child's stress or anxiety level include a teacher's placing unreasonable pressure on the child to perform well in a national award program such as the "President's Council on Physical Fitness Awards" or the "Jump Rope for Heart" or even a classroom exam. Thomas, Thomas, and Lee also listed signals which can serve as anxiety and stress signals in children. These include better performance during practice than in actual

performance, trouble sleeping the night or nights preceding an important event, extreme nervousness or difficulty relaxing before an important event, and mood swings in a child that appear to be related to important events.

Cooper (1982) agreed with Thomas, Thomas, and Lee (1988) to an extent, but he said that improvement in one's fitness level will result in an improved ability to deal with specific stress and anxiety situations which may occur during the course of an average day. He emphasized that through aerobic fitness an individual can reduce his/her heart rate and this heart rate will tend to stay lower and rise more slowly when anxiety strikes, therefore, aiding the individual in staying calmer and in control of his/her emotions. Cooper presented two answers for the lower heart rate and lower anxiety level. He stated:

> First of all, after aerobic conditioning, there is a slight increase in the size of the heart. . . As a result, the heart pumps out more blood with each stroke. In medical terminology this is called an 'increase in stroke volume,' and what it means is that there is a conservation of energy. . . The second reason that the resting heart rate goes down and stays down in that better cardiovascular fitness tends to put a 'governor' on the effect that the adrenal gland's secretions can have on the heart . . . in response to anxiety or fear (p. 189).

Studies of Physical Fitness and Anxiety

Several studies have been focused on an examination of the effects of physical exercise on anxiety and stress. Cooper (1982) supported the relationship between physical fitness and stress management in a six-month research study conducted by the Institute for Aerobics Research in Dallas. The subjects for the study included teachers and administrators of the Dallas Independent School District. The subjects were divided into two groups: (1) an experimental group of 100 subjects who took part in a fitness and good nutrition program, and (2) a control group of 60 subjects who did not do anything to change their exercise habits or diet. Cooper reported that those subjects who participated in the aerobics fitness program and altered their diets

experienced positive changes in the following areas: (1) significant gains in self-concept and reduced depression; (2) a positive change in ability to handle stress; and (3) according to principals, significant improvement in teachers' abilities to cope with job stress.

Folkins, Lynch, and Gardner (1972) investigated the effects of physical fitness on changes in personality, mood, and work behavior variables among 75 college students enrolled in a jogging class and 62 students enrolled in archery and golf courses. To determine the fitness levels of the subjects, the researchers used the subjects' resting heart rate and results of a timed 1.75 mile run. Instruments used to measure psychological variables were the self-confidence and the personal adjustment scales of the Adjective Check List, the anxiety and depression scales of the Multiple Affect Adjective Check List, and two 9-point self-rating scales to assess subjects' ability to handle work. The results of the study showed a significant change in psychological fitness for women who participated in the jogging group. The authors emphasized that, initially, the women were in much poorer condition than the men. Using a correlation analysis, they concluded that women who improved their time in the 1.75 mile run became less depressed, more confident, more personally adjusted, more efficient at work, and more rested. They also reported that as heart rate decreased, the subjects' anxiety also decreased.

Raglin and Morgan (1987) performed a study which examined the claim that state anxiety would be reduced following exercise. The subjects in the study were placed into two groups. One group rested quietly for 40 minutes while the other group participated in aerobic exercise. The subjects' blood pressures and state anxieties were assessed before and after the 40 minutes of exercise in order to study possible changes in blood pressure and anxiety. The State-Trait Anxiety Inventory was used to measure the subjects' anxiety level in the study. The researchers found that both conditions, resting and exercise, reduced levels of state anxiety and blood pressure.

Wilson, Berger, and Bird (1981) conducted a study comparing the effects of running and participation in an exercise class on state anxiety. They also compared the effects of a different activity (eating) on state anxiety. The subjects completed the state form of the State-Trait Anxiety Inventory prior to and following their activity. Wilson, Berger, and Bird found that all groups experienced a reduction in state anxiety. The most significant finding in this study, however, was reported to be the conclusion that frequency of running, not the actual distance covered or running history, was the single-most important feature in reducing anxiety.

Using 37 women and 46 men enrolled in an 8-week individualized exercise program, Wilfley and Kunce (1986) investigated the effects of initial levels of physical fitness and psychological stress on changes in physical fitness, self-concept, and emotional distress following exercise. Each subject participated in three one-hour exercise sessions per week. In their analysis of the differential effects of exercise, the authors reported that the benefits of exercise appeared to be strongly related to the initial levels of stress and fitness. Subjects who were initially low in physical fitness and reported high levels of stress demonstrated significantly more favorable changes in self-concept, total stress, and vitality than subjects who were average physically or who reported less stress.

In a study by Goldwater and Collins (1986), 51 males were assigned to one of two conditioning groups. The treatment programs were similar but differed in that the experimental group participated in cardiovascular conditioning workouts and the control group participated in non-aerobic activities such as volleyball, badminton, and marching. The aerobic group worked out five days a week as compared to two days a week for the controlled non-aerobic group. Anxiety was measured by the TMAS. The researchers found that both groups showed a significant improvement in cardiovascular fitness, with the experimental group showing a significantly greater improvement than the control group. Subjects in the experimental group also showed less anxiety on the

TMAS, although the differences between the groups only bordered on statistical significance (p=0.055). The researchers reported that exercise did not have to be cardiovascular in nature to show an improvement in subjects.

Summary of Physical Fitness and Anxiety

The results of the reported studies demonstrate that stress levels and anxiety levels can decrease as a result of physical fitness activities. Although the positions and studies in the review support the relationship between physical fitness and anxiety level, the majority of subjects utilized in these studies were college students or adults. Further studies utilizing elementary age students as subjects are warranted.

Overview of Piers-Harris Children's Self-Concept Scale

The Piers-Harris Children's Self-Concept Scale (PHCSCS) was developed by Piers (1969) primarily for research and this remains its primary purpose (see Appendix A). It has been found useful when used on an individual basis or a group basis and as a screening device in school classrooms to identify children in need of psychological referral. The scale, designed for children over a wide age range, requires approximately a third grade reading knowledge (Piers, 1969). Much of the information and data collected using the scale have been of the correlational variety. In 1966, Cox conducted one of the first stimulus-response types of studies employing the PHCSCS. In the study, Cox attempted to relate parent-child interaction to self-concept during the developmental period (Piers, 1969).

Piers and Harris (1964) developed an original pool of items for the scale from Jersild's (1952) collection of children's statements about what they liked and disliked about themselves. The original pool of items consisted of 164 declarative statements.

Following a pilot study, Piers and Harris revised the scale to a 140-item scale and later revised the scale to its current 80-item length consisting of 80 declarative statements.

The current version of the PHCSCS employs six interpretable factors. These six factors include: (1) behavior, (2) intellectual and school status, (3) physical appearance and attributes, (4) anxiety, (5) popularity, and (6) happiness and satisfaction. Piers and Harris (1964) suggested that in using the scale one may attend to the responses on the separate factors. They noted, however, that the use of a cluster score must be utilized. For example, in an unpublished study utilizing fourth and sixth-graders, Piers (1969) found that boys rated themselves significantly lower on Factor 1 (Behavior) and on Factor 4 (Anxiety) than did girls. Eastman (1965) found strong correlations (.43 and .50) between cluster scores from Factor 2 (Intellectual and School Status) and the WISC Full Scale and Verbal Scale.

In a similar study using cluster scores from the six factors, Smith (1968) examined the effects of a nine-month program designed to improve the self-concepts of economically deprived students. A sample of 166 fourth, fifth, and sixth grade students was involved in the program. Students were compared with a control group for initial differences in the total Piers-Harris score and cluster scores for the six factors. Smith reported that while there was no significant difference in the total score, Factor 2 (Intellectual and School Status) and Factor 3 (Appearance) showed significant improvements in the experimental group.

As for possible gender biases, Farls (1966), Millen (1966), and Piers and Harris (1964) found no significant differences in the means and standard deviations of total scores between males and females. Also, as for personality correlates, anxiety is a construct which can be expected to be negatively correlated with positive self-attitudes. Millen investigated this using the Children's Manifest Anxiety Scale, and reported that the correlations were substantial, ranging from -.54 to -.69. Millen noted that the results

may be somewhat inflated because the Anxiety factor on the PHCSCS contains similar items to those on the Children's Manifest Anxiety Scale.

The PHCSCS can quickly be completed (15-20 minutes) and can be administered and scored by educated non-psychologists (Piers, 1969). However, Piers suggested that the scores be interpreted with the aid of someone knowledgeable in measurement and statistics, psychology, and self-theory.

Summary of Piers-Harris Children's Self-Concept Scale

The review of literature on the PHCSCS clarified its use as a valid tool for research in investigating and examining self-concept and psychological variables such as anxiety, popularity, behavior, and happiness in children ranging from the third to the twelfth grade. The simple declarative yes/no statements within the instrument make the PHCSCS a device easily administered to fifth grade students (Piers, 1969).

Summary of Literature Review

The literature on the relationship between physical fitness and its effects on self-concept and anxiety presents evidence that positive benefits may occur in these areas as a result of physical fitness. Furthermore, because most of the studies in this area were conducted with adolescents and adults (Goldwater & Collins, 1986; Wilfley & Kunce, 1986). Studies examining non-disabled children 10 to 11 years of age are warranted.

The review of literature concerning the effects of physical fitness on self-concept revealed conflicting conclusions. First, some of the literature shows that a significant positive relationship exists between physical fitness and self-concept (Ben-Schlomo & Short, 1986; Collingwood, 1972; Sharp & Reilly, 1975; Tillman, 1965). Second, other literature does not support a significant relationship between physical fitness and self-concept (Christian, 1969; Huelcki, 1988; & Johnson, 1969). Although

running and jogging were the most frequently investigated forms of physical conditioning, the effects of agility drills, calisthenics, and weight training were also examined.

Results of studies dealing with the effects of physical fitness on anxiety concluded that fitness activities do contribute to improvement in one's ability to cope with stress and anxiety. The studies found that following some form of physical activity, subjects exhibited improvements in their anxiety level even though a cause-effect relationship was not established (Goldwater & Colllins, 1986; Raglin & Morgan, 1987; Wilson, Berger, & Bird, 1981). As a treatment for anxiety and stress, aerobic exercise was the most often recommended type of exercise. Furthermore, the literature showed that while fitness activities are a part of the treatment recommended for people who experienced high anxiety, other factors such as diet, attitude, and the ability to relax play key roles as well.

CHAPTER III

PROCEDURES

Introduction

Chapter III is used to describe the procedures utilized in this study. The chapter has been divided into the following sections: subjects, sampling, instrumentation, data gathering techniques, data analyses, and design of study.

Description of Subjects

The subjects involved in this study were 73 fifth grade children from one elementary public school. The school has a population of approximately 76 fourth grade students and 75 fifth grade students and is located in a small rural community in Northwestern Oklahoma.

The sample included 36 boys and 37 girls, all with a White ethnic background. There were two students in the class who did not participate because of physical disabilities. The average age of the subjects was 11.5 years. All subjects participated in the President's Challenge Fitness Test during the fall semester and again during the spring semester of the 1992-1993 school year.

The subjects were chosen because of the homogeneity of the group, their school's commitment to the physical testing of its students, and because of the cooperation of the school district. Furthermore, much of the research performed in the past has not focused on this particular age group.

Sampling

A convenient sample of 73 fifth grade children from an elementary school in Northwest Oklahoma participated in the first stage of this study. Each of these students had returned an active parental/guardian consent form (see Appendix E). The parental/guardian consent form had been approved by the Institutional Review Board of Oklahoma State University and assured confidentiality of the subject's test results. The first stage consisted of a correlation study to determine whether a relationship existed between physical fitness level and self-concept. It was also determined whether or not a relationship existed between physical fitness level and anxiety level. This stage of the study was conducted during the month of October in the fall semester of the 1992-93 school year.

Stage 2 of the study was designed to examine whether an improvement in fitness level would be accompanied by changes in self-concept and levels of anxiety. For this analysis a comparison group, (N=26), (made up of those students showing no change in fitness level) and an improvement group, (N=43), (made up of students showing improvement in fitness level) were established. Four students who participated in stage one of the study did not participate in stage two. Three of these students had moved to another town and one had become ill during the weeks of testing. This stage of the study was conducted during the month of March in the spring semester of the 1992-93 school year.

Instrumentation

Piers-Harris Children's Self-Concept Scale

In order to measure self-concept and anxiety level, the Piers-Harris Children's Self-Concept Scale was utilized (Piers, 1969). To determine the anxiety level of the subjects, the anxiety subtest which exists within the PHCSCS instrument was employed

(see Appendix B). For this study, the revised version of the PHCSCS scale, which consists of 80 yes/no declarative statements was used. The test was administered by having the subjects mark each of the 80 items either "yes" or "no." These items were then scored by summing the total number of self-concept responses. Those who scored high were considered to have a positive self-concept. Anxiety was measured by using the questions noted in Appendix B. Those subjects who had a high score on the anxiety factor were considered to have a low level of anxiety.

Appendix C presents norms for self-concept based on testing of 1183 Pennsylvania public school children ranging from grades 4 to 12 (Piers, 1969,). Raw scores, together with percentile rankings for members of the normative group, are shown in Table XI in Appendix C. For example, an individual with a raw score of 52 or a percentile ranking of 46 equals or exceeds 46% of the normative group. Average scores are usually considered to be those between the 31st and 70th percentiles, or between raw scores of 46 to 60 (Piers, 1969). Piers noted that norms were not established for the anxiety factor included within the PHCSCS and that further research was needed in this area.

Reliability

In determining reliability, the majority of the reliability data came from the original standardization study, which employed the 95-item scale (Appendix D). However, the revised 80 item-scale, though shorter, was shown to have better reliability by Wing (1966), who found coefficients of .77 for 244 fifth graders for both a two-month and four-month test-retest.

Validity

Jersild (1952) attempted from the beginning to build content validity into the scale by defining the universe to be measured as the areas about which children

reported qualities they liked or disliked about themselves. Mayer (1965) compared scores on the PHCSCS with scores on the Lipsitt's Children Self-Concept Scale (1958) for a sample of 98 special education students, 12 to 16 years of age. Mayer obtained a correlation of .68. Using subjects from grades 6 through 9, Cox (1966) found correlations of .43 and .31 between the Piers-Harris and teacher and peer ratings of socially effective behavior.

President's Challenge Physical Fitness Test

In order to determine the physical fitness level of the subjects, the President's Challenge Physical Fitness Test (PCPFT) was utilized (President's Council on Physical Fitness and Sports, 1992). The PCPFT consists of five challenge items designed to test the overall fitness endurance of the participants. The five challenge items include the following: (1) one-mile run/walk, (2) curl-ups, (3) V-sit reach, (4) shuttle run, and (5) pull-ups or flexed arm hang. The five challenge items and the fitness component they measure are noted in Appendix F. The PCPFT was administered to the subjects within a two-week time period. The subjects were administered one challenge item every other school day during the two weeks of testing. For example, on the first day of testing, the subjects performed the one-mile run/walk. On the third day the students participated in the curl-up phase of the test.

The test was scored by using percentiles established for the PCPFT from a 1985 school population survey conducted by the University of Michigan Institute for Social Research (PCPFS, 1992). In order to convert the percentiles to continuous data form the percentiles were converted to z-scores and then to standard scores (Weinberg & Schumaker, 1962). The scores from the five individual challenge items were added to arrive at an overall fitness score.

Although information pertaining to the reliability and validity of the President's Challenge was not available, the test has been utilized in physical education classes since 1966 as a measure of physical fitness (PCPFS, 1992).

Data Gathering Techniques

In gathering the quantitative data for the correlation study (stage 1), all subjects were administered the PCPFT during the month of October of the 1992-93 school year. The students were administered the test by the physical education instructor and the researcher. The researcher then administered the Piers-Harris Children's Self-Concept Scale to the subjects on the day following the completion of the PCPFT. Before distributing the PHCSCS, the examiner spoke to the subjects about the value of finding out how they really feel about themselves as well as the necessity for a completely honest response rather than a socially desirable one. This was recommended by the Piers-Harris Test Manual. The examiner also stressed that there were no right or wrong answers, that the results would not affect their school grades, and that all results would be kept confidential. A page of brief instructions was provided on the first page of the measuring instrument (see Appendix A). The instructions and scale items were read aloud by the examiner to avoid any comprehension difficulties. To avoid any confusion, the scale items were read twice. This approach was recommended by the PHCSCS Manual for those administering the scale to fifth grade students. The subjects were allowed as much time as they needed to complete the instrument.

In gathering the quantitative data for the second stage of the study, the same procedure was followed at the completion of the PCPFT administered during March in the spring semester of the 1992-93 school year. The time between the administration of the pre-test and the post-test was 120 days.

Data Analyses

The Pearson product-moment correlation coefficient was utilized in stage 1 of this study to determine if a significant relationship existed between the physical fitness level and the self-concept of the selected fifth grade students. The Pearson correlation method was used because the data collected were of a continuous nature (Drew, 1980). The same statistical correlation method was used to determine if a significant relationship existed between physical fitness level and the anxiety level of these same students.

For stage two of the study, a one-way analysis of covariance for independent samples was utilized after the second fitness test to determine if a significant difference existed between the adjusted post-test means of the comparison and improvement groups' self-concept scores and anxiety scores. The one way analysis of covariance was chosen for two reasons: first, because it is a powerful analysis for comparing two independent means; and second, because the use of a one-way analysis of covariance adjusts the post-test means on the basis of cavort (pre-test) (Drew, 1980). The level of confidence was .05.

Design of Study

This study was a combination of a correlation and experimental study. For the correlation stage of the study, all of the students in the class who had received parental consent were administered the 80-item Piers-Harris Self-Concept Scale the day following the completion of the PCPFT during the fall semester of the 1992-93 school year. Scores from the fitness test and self-concept scale were used to determine whether a correlation existed between physical fitness level and self-concept and physical fitness level and anxiety level. It should be noted that prior to the administration of the PHCSCS the subjects were allowed to see their results on the PCPFT.

All of the subjects participated in regular physical education classes during the time period between stage 1 and stage 2 of the study. The activities the subjects participated in during this period included aerobic activities, peg-board climbing, rope climbing, jumping rope, and games designed to enhance the fitness levels of the students.

During the spring semester, the PCPFT was administered again. On the day following the completion of the test, all fifth grade subjects were again given the Piers-Harris Children's Self-Concept Scale. Those students who exhibited improvement in their fitness level were compared to those students who did not exhibit improvement in their fitness level. This comparison was done to determine if improved fitness level would result in a change in self-concept and a change in anxiety level.

Summary

The Pearson correlation coefficient was used to test for a significant relationship between physical fitness level and self-concept and physical fitness and anxiety level. This analysis tested the first two null hypotheses:

H1: There will be no significant relationship between non-disabled fifth grade children's physical fitness levels and their self-concepts.

H2: There will be no significant relationship between non-disabled fifth grade children's physical fitness levels and their anxiety levels.

The analysis of covariance was employed to determine if a positive change in physical fitness level would result in significant change in self-concept and anxiety level. The level of confidence was .05. This analysis tested the remaining two null hypotheses:

H3: There will be no significant difference in the self-concept of those non-disabled fifth grade students who exhibit improvement in their physical fitness levels during the school year and those who do not.

H4: There will be no significant difference in the anxiety levels between those non-disabled fifth grade students who exhibit improvement in their physical fitness levels and those who do not.

Chapter IV will present and analyze the data which were collected to determine if the null hypotheses should be accepted or not accepted.

CHAPTER IV

ANALYSES OF DATA

Introduction

The purpose of this study was to ascertain whether the physical fitness levels of selected non-disabled, fifth grade children correlated with their levels of self-concept and anxiety. This study was also concerned with determining if a change in physical fitness level would result in a significant change in a fifth grade student's self-concept and anxiety level.

This chapter includes the results of the statistical analyses of the data collected in this study. Statistical procedures from SYSTAT version 5.01, 1990 edition and Stat-Star 2.00 were used to analyze the data. The first section will address the first two null hypotheses: (1) there will be no significant relationship between non-disabled fifth grade children's physical fitness levels and their self-concepts, and (2) there will be no significant relationship between non-disabled, fifth grade children's physical fitness and anxiety levels. The remaining sections present results of the analyses pertaining to the secondary null hypotheses: (1) there will be no significant difference in the self-concept of those non-disabled, fifth grade students who exhibit improvement in their physical fitness levels during the school year and those who do not, and (2) there will be no significant difference in the anxiety levels between those non-disabled fifth grade students who exhibit improvement in their physical fitness levels and those who do not.

Relationship Between Physical Fitness and Self-Concept

All students who returned their parental consent forms were utilized for this

stage of the study (N=73). The Pearson product-moment correlation was employed to test the relationship between physical fitness level and self-concept level. Table I lists the means and standard deviations for the physical fitness scores and the self-concept scores for all subjects combined and for boys and girls separately.

TABLE I

MEANS AND STANDARD DEVIATIONS FOR PHYSICAL FITNESS AND SELF-CONCEPT

Group	N	Fitness		Self-Concept	
		M	SD	M	SD
Class	73	265.39	33.37	61.55	12.03
Boys	36	251.28	31.90	59.33	11.38
Girls	37	279.05	28.85	63.70	12.15

The Pearson correlation between physical fitness and self-concept for the entire group was significant (r=.59, p<.05). The coefficient of determination was .35. When analyzed separately for males and females, the correlation was significant (r=.53, p<.05) for males and for females (r=.64, p<.05) (Table II).

The correlation of .59 for the entire group indicated a moderate relationship between fitness level and self-concept. The coefficient of determination (r=.35) indicated that 35% of the variance among the criterion scores (self-concept) is explained by differences in the predictor variable (fitness level) (Huck, Cormier, & Bounds, 1974).

TABLE II

PEARSON CORRELATION: CORRELATION AND COEFFICIENTS OF DETERMINATIONS BETWEEN PHYSICAL FITNESS AND SELF-CONCEPT

Group	Correlation	Coefficient of Determination
Class	.59*	.35
Boys	.53*	.28
Girls	.64*	.41

These results supported the positions of Martens (1975) and Pangrazi (1982), who suggested that physical fitness is related to self-concept. The findings also supported Leonardson (1977), who reported a significant relationship between perceived fitness and self-concept.

Relationship Between Physical Fitness and Anxiety

The Pearson product-moment correlation was utilized to test the relationship between the two variables of physical fitness level and anxiety level. Table III lists the means and the standard deviations for the group's physical fitness scores and the group's anxiety scores, as well as the means and standard deviations for fitness scores and anxiety scores for boys and girls separately.

Table IV presents the results of the Pearson correlation for physical fitness and anxiety. The original group was significant (r=.39, p<.05). The coefficient of determination was .15. Separating the class according to gender provided a correlation

of .60 and a coefficient of determination of .36 for males, and a correlation of .37 and a coefficient of determination of .14 for females. These results supported the positions of Morris and Beck (1972) and Cooper (1982), who reported the use of physical fitness activities as a means for relieving anxiety.

TABLE III

MEANS AND STANDARD DEVIATIONS FOR PHYSICAL FITNESS AND ANXIETY

Group	N	Fitness		Self-Concept	
		M	SD	M	SD
Class	73	265.42	33.36	8.93	2.51
Boys	36	251.33	31.82	9.17	2.24
Girls	37	279.05	28.85	8.70	2.72

Comparing Pre-Test and Post-Test Self-Concept Scores

The second stage of this study was intended to determine if a change in fitness level would result in a change in self-concept and anxiety level. For this stage, two groups were established: an improvement group, which consisted of students who had improved their fitness level during the school year; and a comparison group, consisting of students who had not improved their fitness level during the school year.

TABLE IV

PEARSON CORRELATION: CORRELATION AND COEFFICIENTS OF DETERMINATIONS BETWEEN PHYSICAL FITNESS AND ANXIETY

Group	Correlation	Coefficient of Determination
Class	.39*	.15
Boys	.60*	.36
Girls	.37*	.14

*$p<.05$

TABLE V

MEANS, STANDARD DEVIATIONS, AND COMPARISON OF PRE-TEST AND POST-TEST SCORES ON SELF-CONCEPT FOR IMPROVEMENT AND COMPARISON GROUPS

		Pre-Test		Post-Test			
Group	N	M	SD	M	SD	t	p
Improvement	43	61.74	11.05	66.56	9.80	4.184	.0001*
Comparison	26	61.12	13.53	60.65	14.39	.303	.765

*$p<.05$

Table V presents the self-concept pre-test and post-test means and standard deviations, along with the t-values and p-values for the improvement group (N=43) and the comparison group (N=26). A t-test for correlated samples with alpha set at .05 was used to test the difference between the pre-test and post-test means.

The t-test was utilized to determine if a significant change in self-concept occurred between the pre-test and post-test (Huck, Cormier, & Bounds, 1974). The results of the t-test for the improvement group indicated a significant p-value of .0001, $p<.05$. For the comparison group, the results indicated no significant difference between the pre-test and post-test means with $p = .76$, $p > .05$.

Comparing Pre-Test and Post-Test Anxiety Scores

Table VI presents the means and standard deviations for the anxiety pre-test and post-test for the two groups. The t-test for correlated samples with alpha set at .05 was utilized to compare the means. The t-test was utilized to determine if a significant change in anxiety scores occurred between the pre-test and post-test (Huck, Cormier, & Bounds, 1974).

TABLE VI

MEANS, STANDARD DEVIATIONS, AND COMPARISONS OF PRE-TEST AND POST-TEST SCORES ON ANXIETY LEVELS FOR IMPROVEMENT AND COMPARISON GROUPS

Group	N	Pre-Test M	Pre-Test SD	Post-Test M	Post-Test SD	t	p
Improvement	43	9.75	2.44	9.58	2.55	2.017	.0513
Comparison	26	9.24	2.29	9.21	2.29	.077	.9394

The results for the improvement group did not indicate a significant change in anxiety level between the pre-test and post-test, although they did approach significance with a t=2.017, p=.051, p>.05. For the comparison group, there was no significant difference between the pre-test and post-test (t=.077, p=.9394, p>.05).

Comparing Post-Test Self-Concept Means Between Groups

A one-way analysis of covariance was utilized to determine if a significant difference existed between the improvement and comparison group's self-concept (dependent variable) post-test means, with alpha set at .05. The scores on the self-concept pre-test were used as the concomitant variable. The purpose for using this analysis was to adjust for any initial group differences (Huck, Cormier, & Bounds, 1974). An initial test used to test for the assumption of a common slope was not significant; therefore, other steps in the analysis were conducted. Table VII presents the summary table for the one-way analysis of covariance. The results showed that a significant difference exists between the improvement and comparison groups' adjusted means on the self-concept post-test (dependent variable), $F(1, 1, 66) = 8.59$, $p = .004$.

These results indicated that, as physical fitness level increases, self-concept scores increase. The results also supported the findings of Behrman (1985), who found a significant difference in the self-concept scores of third and fourth grade students who ranked high in physical fitness and those who ranked low.

Comparing Post-Test Anxiety Means Between Groups

To determine if a significant difference existed between the improvement and comparison groups' post-test anxiety scores (dependent variable), a one-way analysis of covariance was used with the alpha level established at .05. The concomitant

variable was the pre-test anxiety scores. The initial test utilized to determine the assumption of common slopes was not significant; therefore, other steps in the analysis were conducted. Table VIII presents a summary of the results of the one-way analysis of covariance. The results indicated that there is not a significant difference between the groups' adjusted post-test means for anxiety level, F (1, 1, 66)=3.06, p=.085.

TABLE VII

ANALYSIS OF COVARIANCE: COMPARISON BETWEEN GROUPS ON POST-TEST SELF-CONCEPT SCORES

Source	Sum of Squares	Degree of Freedom	Mean Square	F Ratio	p
Fitness Level	471.01	1	471.01	8.59	.004*
Self-Concept (Covariate)	6036.62	1	6036.62	114.81	.000
Error	3470.00	66	52.57		

*p<.05

Comparing Gender and Self-Concept

A two-way analysis of variance was used to analyze pre-test and post-test self-concept data to determine if a significant difference existed between the self-concept scores of females and the self-concept scores of males. The purpose for doing this analysis was that the initial stage of this study indicated a stronger correlation between

physical fitness and self-concept for females than for males. The results of this analysis are presented in Table IX. The results do not indicate that a significant difference exists for the two main effect variables (gender and self-concept).

TABLE VIII

ANALYSIS OF COVARIANCE: COMPARISON BETWEEN GROUPS ON POST-TEST ANXIETY SCORES

Source	Sum of Squares	Degree of Freedom	Mean Square	F Ratio	p
Fitness Level	13.43	1	13.43	3.06	.085
Anxiety Pre-Test (Covariate)	117.27	1	117.27	24.91	.000
Error	289.84	66	4.39		

It should be noted that these results are not directly related to the hypotheses but were analyzed to determine if gender differences were a significant factor in determining self-concept level in this study.

Comparing Gender and Anxiety

Stage 1 of this study indicated that a stronger relationship between physical fitness and anxiety existed for males than for females. A two-way analysis of variance was utilized to determine if a significant difference existed between the anxiety levels of males and females using gender and pre-test and post-test anxiety scores as the two

independent variables. Table X presents the results of this analysis. The results do not indicate that a significant difference exists for the main variables. These results are not directly related to the hypotheses but were analyzed to determine if gender was a significant factor affecting the anxiety levels of fifth grade students who participated in this study.

TABLE IX

TWO-WAY ANALYSIS OF VARIANCE: COMPARING EFFECTS OF GENDER AND PRE-TEST AND POST-TEST SELF-CONCEPT SCORES ON OVERALL SELF-CONCEPT

Source	Sum of Squares	Degree of Freedom	Mean Square	F Ratio	p
Gender	425.523	1	425.523	2.832	0.095
Self-Concept	330.917	1	330.917	2.202	0.140
Gender x Self-Concept	22.917	1	22.917	0.153	0.697
Within	19231.636	128	150.247		
Total	20010.992	131			

TABLE X

TWO-WAY ANALYSIS OF VARIANCE: COMPARING EFFECTS OF GENDER AND PRE-TEST AND POST-TEST ANXIETY SCORES ON OVERALL ANXIETY

Source	Sum of Squares	Degree of Freedom	Mean Square	F Ratio	p
Gender	10.939	1	10.939	1.826	0.179
Anxiety	6.818	1	6.818	1.138	0.288
Gender x Anxiety	5.121	1	5.121	0.844	0.257
Within	766.667	128	5.990		
Total	789.545	131			

Results as Related to Hypotheses 1 - 4

Results Related to Hypothesis 1

The first null hypothesis was that there would not be a significant relationship between non-disabled fifth grade children's physical fitness level and their self-concepts. Results of the data did not support the hypothesis. A Pearson product-moment correlation was used to assess the associations between the continuous variables, pre-test fitness scores and pre-test self-concept scores. (These correlations were presented in Table II.)

The results indicated a significant statistical relationship between the two variables ($r=.59$, $p<.05$). The results also indicated that, as pre-test fitness level scores increase, self-concept scores increase.

Results Related To Hypothesis 2

The second null hypothesis stated that there would not be a significant relationship between non-disabled, fifth grade children's physical fitness levels and their anxiety levels. It should be noted that a high anxiety score indicates a lower anxiety level. Results of the analysis supported the hypothesis. A Pearson product-moment correlation was utilized to analyze the relationship between the two continuous variables, pre-test fitness scores and pre-test anxiety level scores. (The correlations were presented in Table IV).

Results of the analysis indicate a significant statistical inverse relationship between the two variables, $r=.39$, $p<.05$. The results indicated that as fitness level increases, anxiety level decreases.

Results Related to Hypothesis 3

The third hypothesis was that there would be no significant difference in the self-concept of those students who exhibited improvement in their physical fitness levels during the school year and those who did not. Results of the data analyses did not support the hypothesis. A one-way analysis of covariance was utilized to determine if a significant difference existed between the improvement group post-test mean score and the comparison group post-test mean score on self-concept. (The summary of data was presented in Table VII).

Analyses of the data indicated that a significant difference does exist between the group's adjusted post-test self-concept means, $F(1, 1, 66)=8.96$, $p=004$. Results indicated that as physical fitness level improves, self-concept improves.

Results Related to Hypothesis 4

The fourth null hypothesis stated that there would be no significant difference in the anxiety levels between those students who exhibited improvement in their physical

fitness levels and those who did not. Using a one-way analysis of covariance, the data analyses indicated no significant difference in the adjusted mean scores on anxiety between the improvement group and the comparison group, $F(1, 1, 66)=3.06$, $p=.085$ (see Table VIII). Therefore, Hypotheses 4 was supported.

CHAPTER V

DISCUSSION

Introduction

Chapter V presents a summary of the study, a discussion of the results relative to the null hypothesis, conclusions, and implications for further research and for physical education.

Summary

The primary purpose of this study was to examine the relationship between physical fitness and self-concept and the relationship between physical fitness and anxiety among non-disabled, fifth grade students. The secondary purpose of this study was to ascertain whether an improvement in physical fitness level would result in a change in self-concept and anxiety levels in non-disabled, fifth grade students.

In September of 1992, permission was granted by the superintendent to begin a study using the non-disabled, fifth grade students at an elementary school for the 1992-93 school year. The researcher met with the superintendent of the school system, the principal of the school, and the physical education instructor at the school to review the purpose and procedure of the study. Before any subjects participated in the study, they were required to return a parental consent form to their instructor.

Subjects for the correlation stage of this study consisted of 73 non-disabled, fifth grade students (37 females and 36 males, aged 10 to 12). During the fall semester of the 1992-93 school year, the physical education instructor and the researcher administered the President's Challenge Physical Fitness Test (PCPFT) to all

participants. On the day following the completion of the fitness test, the researcher administered the Piers-Harris Self-Concept Scale to all subjects. The researcher scored the physical fitness tests, self-concept scales, and anxiety scales.

A Pearson product-moment correlation was employed to test the hypothesis that no significant relationship existed between the physical fitness level and self-concept of non-disabled, fifth grade students. The variables included the test scores for physical fitness and self-concept. Results of the Pearson correlation revealed a significant positive relationship between physical fitness and self-concept.

A Pearson correlation was utilized to test the second hypothesis that there would be no significant inverse relationship between the physical fitness level and the anxiety levels of non-disabled, fifth grade students. Results of the analyses showed that a significant inverse relationship did exist.

During the spring semester of the 1992-93 school year, stage 2 of this study was conducted. The physical education instructor and the researcher administered the PCPFT to 69 subjects. On the day following the completion of the fitness tests, the researcher administered the Piers-Harris Self-Concept Scale to the 69 subjects. The physical fitness tests, self-concept scales, and anxiety scales were scored by the researcher. After scoring the physical fitness tests to determine if the subjects had improved their fitness levels, the researcher divided the subjects into an improvement group and a comparison group. The improvement group consisted of 43 subjects who had improved their fitness levels. The comparison group consisted of 26 subjects who had not improved their fitness levels. Statistical analyses showed that the two groups, improvement and comparison, were enough alike to proceed with stage 2 of this study.

A one-way analysis of covariance was utilized to determine if a significant difference existed between the improvement group and the comparison groups' adjusted post-test means on self-concept. The results of the data showed that a significant difference did exist.

The same procedure was used to determine if a significant difference existed between the improvement and comparison groups' adjusted post-test means for anxiety level. The results indicated no significant difference.

Findings

Relationship Between Physical Fitness and Self-Concept

A Pearson correlation was used to determine if a significant positive relationship existed between physical fitness and self-concept for the original group. A significant positive relationship was found between the two variables. These findings did not support the first hypothesis and indicated that the physical fitness level of the fifth grade students involved in this study was related to their self-concepts. This means, in essence, that those students who have a higher physical fitness level also have a higher self-concept.

Relationship Between Physical Fitness and Anxiety

A Pearson correlation was used to determine if a significant inverse relationship existed between physical fitness and anxiety level for the original group. A significant inverse relationship was found between the two variables. These findings did not support the second hypothesis concerning the relationship between physical fitness and anxiety level. Therefore, in this study, those fifth grade students who had higher physical fitness levels could experience lower anxiety.

Comparing Pre-Test Mean Scores and Post-Test Mean Scores on Self-Concept for Females to the Pre-Test Mean Scores and Post-Test Mean Scores for Males

A two-way analysis of variance was used to determine if a significant difference existed between the self-concept scores of the males and females. No significant difference was found between the two groups of scores. The results indicated that the gender of the subjects involved in this study did not have a significant impact on the results of the self-concept scores of the subjects.

Although these findings did not directly relate to the hypothesis, they were analyzed to determine if gender difference was a significant factor in determining self-concept in this study.

Comparing Pre-Test Mean Scores and the Post-Test Mean Scores on Anxiety for Females to the Pre-Test Mean Scores and Post-Test Mean Scores for Males

A two-way analysis of variance was used to determine if a significant difference existed between the anxiety scores of the males and females. No significant difference was found between the scores of the two groups, indicating that the results of the anxiety scale were not significantly influenced by the gender of the subjects.

Although these findings were not directly related the the hypothesis, they were analyzed to determine if gender was a significant factor affecting the anxiety levels of fifth grade students in this study.

Improvement Group Mean Scores on the Self-Concept Pre-Test Compared to the Post-Test Mean Scores for the Improvement Group

A t-test for correlated samples was used to compare pre-test scores on the

Piers-Harris Self-Concept Scale with post-test scores. The t-test was utilized to determine if those students who had improved their physical fitness levels had significantly improved their self-concept scores. A significant difference was found between the two groups of scores. These results indicated that those students who improved their physical fitness levels also experienced a positive change in their self-concepts.

This study supported the findings of Collingwood and Willett (1971) by indicating that improved fitness levels can increase self-concept.

Comparison Group Mean Scores on the Self-Concept Pre-Test Compared to the Post-Test Mean Scores for the Comparison Group

A t-test for correlated samples was used to compare pre-test scores on the Piers-Harris Self-Concept Scale to post-test scores. The t-test was used to determine if those students who had not improved their physical fitness scores would experience a change in self-concept scores. No significant difference existed between the two groups of scores. These results indicated that those students who did not improve their physical fitness levels during the school year did not experience a significant change in their self-concepts between the pre-test and the post-test.

Improvement Group Post-Test Mean Scores on the Self-Concept Post-Test Compared to the Post-Test Mean Scores for the Comparison Group

An analysis of covariance was used to compare the adjusted post-test mean scores on self-concept between the improvement and comparison groups. A significant difference was found between the groups. These findings indicated that fifth grade students who improve their physical fitness levels will have a significantly higher self-

concept score ($p < .05$) than those students who do not improve their physical fitness levels. These findings did not support the third hypothesis stating that there would be no significant difference in the self-concepts of those non-disabled, fifth grade students who exhibited improvement in their physical fitness levels during the school year and those who did not. Furthermore, these results would indicate that improving the fitness levels of students can enhance their self-concept. In essence, physical education classes that successfully improve the overall fitness levels of students not only improve the physical domain of the student but can also improve the psychological domain as well.

Improvement Group Post-Test Mean Scores on the Anxiety Post-Test Compared to the Post-Test Mean Scores for the Comparison Group

An analysis of covariance was used to compare the adjusted post-test mean scores on anxiety between the experimental and groups. No significant difference was found between the scores of the two groups. These findings supported the fourth hypothesis stating that there would be no significant difference in the anxiety levels between those non-disabled fifth grade students who exhibited improvement in their physical fitness levels and those who do not. This means, in essence, that improving the fitness levels of students will not have a significant impact on their levels of anxiety.

These findings may also support the position of Thomas, Thomas, and Lee (1988), who suggested that anxiety and stress are specific to different situations. For example, having the students participate in the PCPFT may have affected their anxiety levels. This consideration could be a topic for further research.

Conclusions

This study supported the premise that the physical fitness levels of fifth grade

students are related to their self-concept and anxiety levels. The review of literature consists of opinions and studies which also supported this position. The results indicated that improving fitness level significantly enhances self-concept level, but does not significantly reduce anxiety level. Thomas, Thomas, and Lee (1988) suggested that anxiety may be specific to different situations. For example, if the students experienced unreasonable pressure to perform well on the PCPFT or the Piers-Harris Children's Self-Concept Scale, this might have contributed to a higher anxiety level in these students during the testing time periods.

Through the use of the PCPFT it was determined that 43 of the 69 subjects improved their fitness levels, while 26 students did not. This could be attributed to such factors as the students' attitudes toward the physical education teacher, the physical education teacher's attitude toward these students, and the students' attitudes toward the physical fitness activities that they participated in throughout the year (Pangrazi, (1982). Pangrazi also suggested that students should be allowed to progress at their own rates in physical education classes. There may have been various times throughout the year that these students participated in fitness activities they were not capable of performing at a level sufficient enough to provide them with the same fitness benefits as those who were successful; therefore, the non-successful students may not have improved their fitness levels at all on these particular days. All of the factors mentioned above may be variables which could be considered if this study is replicated.

Recommendations for Further Research

One recommendation for further research is that this study be repeated with some variations. Other studies could be conducted by:

1. Using all students, not just those in the fifth grade.
2. Comparing private schools to public schools.

3. Not allowing students to become familiar with the results of their fitness scores before administering the Piers-Harris Self-Concept Scale.

4. Determining the effect that the physical education instructor has on the self-concept and anxiety levels of students.

5. Determining the effect that the physical education instructor has on the physical fitness levels of students.

6. Using other measurement instruments for determining overall fitness levels such as the American Association for Health, Physical Education, Recreation and Dance Health Related Fitness Test or the Amateur Athletic Union Testing Program.

7. Using other instruments to measure self-concept and anxiety, such as the Tennessee Self-Concept Scale, Coopersmith Self-Esteem Inventory, and the State-Trait Anxiety Inventory.

8. To expand the study by using qualitative methods in order to determine possible multiple causations and conditions that influence a student's self-concept.

This study did not include a wide variety of ethnic and economic backgrounds; therefore, other studies researching these areas are recommended.

Recommendations for Practice

Elementary education programs and physical education programs may apply this study to the improvement of curriculum programs. Also, school superintendents, principals, teachers, and parents may also find this study beneficial for supporting physical education in their schools.

Recommendations for Elementary Education

Unfortunately, physical education and fitness programs have been a target for elimination in some curricula. Continued research pertaining to the relationship between the physical self and the psychological self is needed. State legislators,

school boards, superintendents, principals, teachers, and parents should be exposed to the content, extent, and results of research involving physical fitness and psychological fitness. School administrators should know about the relationship between physical fitness activities and the psychological benefits of such activities before deciding to remove physical education from the curriculum. In fact, such knowledge may encourage more school districts to add elementary physical education classes to their daily curriculum.

Recommendations to Physical Education Programs

Since physical fitness improvement is of benefit to all students, physically and psychologically, physical education instructors should become experienced in teaching activities that promote physical fitness improvement.

Physical education instructors, administrators, and curriculum designers should consider a commitment to physical education programs by identifying the benefits of well-designed programs and by making the necessary efforts to introduce these programs into their schools. Based on this study, a well-designed physical education program should incorporate activities and games that enhance the overall fitness levels of the students involved. Some activities should be designed so that students can enjoy them at home and, if possible, for a lifetime. Programs should include methods for improving strength endurance, cardiovascular endurance, flexibility, and nutrition. All of these are involved in lifetime health and fitness and should continue to improve self-concept throughout life. Furthermore, the lack of a significant difference between genders indicates that girls and boys can enhance their self-concept by improving their fitness level. For physical education programs, this means that a well-planned program should incorporate activities from which both girls and boys may derive fitness benefits. This does not mean that all activities should be coeducational; instead, it means that all students should be actively involved in the physical education classroom during their

physical education period. The results of this dissertation show that an elementary physical education program that emphasizes overall fitness improvement can have a significant impact on the affective domain as well as the physical domain.

Final Statement

Research and knowledge of research is vital to maintaining quality education programs in schools. This study indicated that the physical fitness level of fifth grade students is related to their self-concepts and anxiety levels. This study also supported the idea that an improvement in physical fitness can result in an improved self-concept. Of particular value related to these findings is the importance that physical education programs with well-planned fitness programs could have in contributing to the affective domain as well as the physical domain of children. School administrators should begin to assist physical education instructors in developing physical education programs designed to improve the physical fitness level of students. Also, administrators should consider the benefits of physical education programs and should support efforts to maintain these programs in their schools.

Physical education instructors are in a position to control the curriculum within their classrooms and should provide students and parents with information explaining the benefits of improving their fitness levels. In addition, parents should become fitness literate and should insist that their schools maintain high quality physical education programs. By becoming fitness literate, parents can assist physical education teachers in developing positive attitudes and desirable fitness behaviors in children.

National education goals have been established by past and present administrations, but within these goals there is no mention of physical education. The present administration should consult the President's Council on Physical Fitness and should consider making physical fitness goals a part of their national education goals.

REFERENCES

Behrman, M. W. (1985). A study of the differences in the self-concept of third, fourth, and fifth grade students who ranked in the highest and lowest groups on a measure of physical fitness. Dissertation Abstracts International, 47, 826-03A.

Ben-Schlomo, L. S., & Short, M. A. (1983). The effects of physical exercise on self attitudes. Occupational Therapy in Mental Health, 3, 11-28.

Ben-Schlomo, L. S., & Short, M. A. (1986). The effects of physical conditioning on selected dimensions of self concept in sedentary females. Occupational Therapy in Mental Health, 5, 27-46.

Bradfield, R. H., Cannon, P., Parker, M., & Lualhati, R. (1981). Run to learn-learn to run: Exercise as a behavior and academic facilitator. Physical Educator, 46(1), 27-32.

Calhoun, G., & Morse, W. (1977). Self-concept and self-esteem: Another perspective. Psychology in the Schools, 14, 318-322.

Carlson, J., & Ardell, D. B. (1981). Physical fitness as a pathway to wellness and effective counseling. Counseling and Human Development, 13, 1-9.

Christian, J. A. (1969). Relationship between fitness and self-concept. Dissertation Abstracts International, 30, 2872-8A.

Collingwood, T. R. (1972). The effects of physical training upon behavior and self attitudes. Journal of Clinical Psychology, 28, 583-585.

Collingwood, T. R., & Willett, L. (1971). The effects of physical training upon self-concept and body attitude. Journal of Clinical Psychology, 27, 411-412.

Combs, A. W. (1965). The Professional Education of Teachers. Boston: Allyn and Bacon.

Cooley, C. H. (1922). Human Nature and the Social Order. New York: Charles Scribner & Sons.

Cooper, K. H. (1982). The Aerobics Program for Total Well-being. New York: M. Evans.

Cox, S. H. (1966). Family background effects on personality development and social acceptance. (Unpublished Doctoral Dissertation, Texas Christian University.)

Croce, R., & Lavay, B. (1985). Now more than ever, physical education for the elementary school-aged child. Physical Educator, 42 (2), 52-58.

Davis, M. W. (1970). The effects of a cardiovascular conditioning program on selected psychological responses of college males. Dissertation Abstracts International, 31, 221-A.

deVires, H. A. (1986). Physiology of Exercise for Physical Education and Athletics. Dubuque, Iowa: William Brown.

DeWolf, T. R. (1991). The effects of levels of exercise and gender on depression and anxiety. (Unpublished Doctoral Dissertation, Oklahoma State University.)

Drew, C .J. (1980). Introduction to Designing and Conducting Research. St. Louis: C. V. Mosby.

Eastman, E. (1965). The relationship between self-concept and intelligence in children. (Unpublished Research Paper, Whitworth College).

Farls, R. (1966). Unpublished data received from Freedom Area School District, Freedom, Pennsylvania.

Folkins, C., Lynch, S., & Gardner, M. (1972). Psychological fitness as a function of physical fitness. Archives of Physical Medicine and Rehabilitation, 53, 503-508.

Goldwater, B. C., & Collins, M. L. (1986). Psychological effects of cardiovascular conditioning: A controlled experiment. Psychosomatic Medicine, 47, 174-181.

Handly, R. (1985). Anxiety and Panic Attacks. New York,: Fawcett Crest.

Hellison, D. R. (1973). Humanistic Physical Education. Englewood Cliffs, New Jersey: Prentice Hall.

Hilyer, J. C., & Mitchell, W. (1979). Effect of systematic training combined with counseling on the self-concept of college students. Journal of Counseling Psychology, 26, 427-436.

Huck, S. W., Cormier, W. H. & Bounds, W. G. (1974). Reading Statistics and Research. New York: Harper and Ross.

Hulecki, M. B. (1988). The relationship between increased physical fitness and learning disabled children's self-concept, anxiety, and academic achievement. Dissertation Abstract International, 49, 3269-11A.

Humphrey, J. H. (1980). Child Development Through Physical Education. Springfield, Illinois: Bannerstone House.

Ismail, A. H., & Trachtman, L. E. (1973). Jogging the imagination. Psychology Today, 6, 78-82.

Jasnoski, M. L., & Holmes, D. S. (1981). Influence of initial aerobic fitness, aerobic training and changes in aerobic fitness on personality functioning. Journal of Psychosomatic Research, 25, 553-556.

Jersild, A. T. (1952). In Search of Self. New York: Teachers College, Columbia University, Bureau of Publications.

Johnson, B. W. (1969). A study of the relationship among self concept, movement concept and physical fitness and the effects of a physical conditioning program and a sports-skill program upon self concept and movement concept. (Unpublished Doctoral Dissertation, Florida State University.)

Jorgenson, C. B., & Jorgenson, D. E. (1979). Effect of running on perception of self and others. Perceptual and Motor Skills, 48, 242.

Lee, M. (1983). A History of Physical Education and Sports in the U.S.A. New York: John Wiley and Sons.

Leonardson, G. R. (1977). Relationship between self-concept and perceived physical fitness. Perceptual and Motor Skills, 44, 62.

Leonardson, G. R., & Gargivlo, R. M. (1978). Self-perception and physical fitness. Perceptual and Motor Skills, 46, 338.

Lipsitt, L. P. (1958). A self-concept scale for children and its relation to the children's form of the manifest anxiety scale. Child Development, 29, 463-472.

Martens, R. (1975). Social Psychology and Physical Activity. New York: Harper and Row.

Martinek, T. J., & Johnson, L. B. (1979). Teacher expectations: Effects on dyadic interactions and self-concept in elementary age children. Researcher Quarterly, 50, 60-70.

Mayer, C. L. (1965). A study of the relationship of early special class placement and the self-concept of mentally handicapped children. (Unpublished Doctoral Dissertation, Syracuse University.)

McGowan, R. W., Jarman, G. O., & Pederson, D. M. (1974). Effects of a competitive training program on self-concept and peer approval. Journal of Psychology, 86, 57-60.

McIntyre, T. D. (1971). A field experimental study of cohesiveness status and attitude change in four biracial small sport groups. Abstracts of research papers. American Alliance for Health, Physical Education and Recreation, 56, p. 83.

Millen, L. (1966). The relationship between self-concept, social desirability and anxiety in children. (Unpublished Master's Thesis, Pennsylvania State University.)

Morgan, W. P. (1985). Affective beneficence of vigorous physical activity. Medicine and Science in Sports and Exercise, 17, 94-100.

Morgan, W. P. (1984). Coping with mental stress: The potential and limits of exercise intervention. Bethesda: NIMH, 11-14.

Morris, J. B., & Beck, A. T. (1972). The efficacy of anti-depressant drugs: A review of research. Archives of General Psychiatry, 30, 667-674.

Oglesby, C. (1987). Psycho-Social Aspects of Physical Education. Reston, Virginia: American Alliance for Health, Physical Education, Recreation, and Dance.

Oklahoma State Department of Education (1992). Report on Curriculum. Oklahoma City, Oklahoma.

Oliver, J. N. (1960). The effects of physical conditioning on the sociometric status of educationally sub-normal boys. Physical Education, 52 (156), 38-46.

Owens, J. (1981). Physical education activity for everyone. Viewpoints in Teaching and Learning, 57, 94-98.

Pangrazi, R. (1982). Physical education, self-concept, achievement. Journal of Physical Education, Recreation and Dance, 32, 16-18.

Percy, L. E., Dziuban, C. D., & Martin, J. D. (1980). Analysis of effects of distance running on self-concepts of elementary students. Perceptual and Motor Skills, 52, 42.

Piers, E. V. (1969). The Piers-Harris Children's Self-Concept Scale. Nashville, Tennessee: Counselor Recordings and Tests.

Piers, E. V., & Harris, P. B. (1964). Age and other correlates of self-concept in children. Journal of Educational Psychology, 55, (2), 91-95.

Plato. (1946). The Republic (M. O'Brian, Trans.) Cleveland, Ohio: Fund Editions Press. (Original work published in 388 B. C.)

Pollock, M. L. (1974). Follow-up study on the effects of conditioning four days per week on the physical fitness of adult males. American Corrective Therapy Journal, 28, 135-139.

President's Council on Physical Fitness and Sports. (1971). Physical Fitness Research Digest, 1, 1-12. Washington, D.C. : U.S. Government Printing Office.

President's Council on Physical Fitness and Sports. (1992). The President's Challenge Physical Fitness Program Packet. Bloomington, Indiana: Poplars Research Center.

Raglin, J. S., & Morgan, W. P. (1987). Influence of exercise and quiet rest on state anxiety and blood pressure. Medicine and Science in Sports and Exercise, 19, 456- 463.

Roberts, J. M., Arth, M. J., & Bush, R. R. (1959). Games in culture. American Anthropology, 61, 597-605.

Roberts, J. M., & Sutton-Smith, B. (1962). Child training and game involvement. Ethnology, 2, 166-185.

Sharp, M. W., & Reilley, R. R. (1975). The relationship of aerobic physical fitness to selected personality traits. Journal of Clinical Psychology, 31, 428-430.

Smith, M. (1968). Evaluation Report of a Pilot Program to Raise Self-Concepts of Economically Deprived Students. (Title III E.S.E.A.) Pontiac, Michigan: Pontiac Schools.

Sonstroem, R. J., & Metz, K. F. (1969). Physical fitness, self-esteem, and attitudes toward physical activity. Research Quarterly, 40, 743-749.

Swede S., & Seymour S. J. (1987). The Panic Attack Recovery Book. New York, New York. New American Library.

Taylor, J. A. (1953). A personality scale of manifest anxiety. Journal of Abnormal and Social Psychology, 48, 285-290.

Tenoschok, M. (1984, November). Physical education: A basic. Middle School Journal, 5, pp. 26-27.

Thomas, J. R., Thomas, K. T., & Lee, A. M. (1988). Physical Education for Children: Concepts into Practice. Champaign, Illinois: Human Kinetics.

Tillman, K. (1965). Relationship between physical fitness and selected personality traits. Research Quarterly, 36, 483-489.

Weinberg, G. H., & Schumaker, J. A. (1962). Statistics: An intuitive approach. Belmont, California: Wadsworth Publishing.

Wilfley, D., & Kunce, J. (1986). Differential physical and psychological effects of exercise. Journal of Counseling Psychology, 33, 337-342.

Wilmore, J. (1986). Sensible Fitness. Champaign, Illinois: Leisure Press.

Wilson, V. E., Berger, B. G., & Bird, E. J. (1981). Effects of running and of an exercise class on anxiety. Perceptual and Motor Skills, 53, 472-474.

Wing, S. W. (1966). A study of children whose reported self-concept differs from classmates' evaluation of them. (Unpublished Doctoral Dissertation, University of Oregon.)

Wood, D. T. (1977). The relationship between state anxiety and acute physical activity. American Corrective Therapy Journal, 31, 67-69.

APPENDIXES

APPENDIX A

QUESTIONNAIRE: THE WAY I FEEL ABOUT MYSELF

NAME _____

AGE _____ GIRL OR BOY _____

GRADE _____ SCHOOL _____

DATE _____

Here is a set of statements. Some of them are true of you and so you will circle yes. Some are not true of you and so you will circle the no. Answer every question even if some are hard to decide, but do not circle both yes and no. Remember, circle the yes if the statement is generally like you or circle the no if the statement is generally not like you. There are no right or wrong answers. Only you can tell us how you feel about yourself, so we hope you will mark the way you really feel inside.

1. My classmates make fun of me ---------- yes no
2. I am a happy person ---------- yes no
3. It is hard for me to make friends ---------- yes no
4. I am often sad ---------- yes no
5. I am smart ---------- yes no
6. I am shy ---------- yes no
7. I get nervous when the teacher calls on me ---------- yes no
8. My looks bother me ---------- yes no
9. When I grow up, I will be an important person ---------- yes no
10. I get worried when we have tests in school ---------- yes no
11. I am unpopular ---------- yes no

I am well behaved in school ---------- yes no

13. It is usually my fault when something goes wrong ---------- yes no
14. I cause trouble to my family ---------- yes no
15. I am strong ---------- yes no
16. I have good ideas ---------- yes no
17. I am an important member of my family ---------- yes no
18. I usually want my own way ---------- yes no
19. I am good at making things with my hands ---------- yes no
20. I give up easily ---------- yes no
21. I am good in my school work ---------- yes no
22. I do many bad things ---------- yes no
23. I can draw well ---------- yes no

24. I am good in music ---------- yes no
25. I behave badly at home ---------- yes no
26. I am slow in finishing my school work ---------- yes no
27. I am an important member of my class ---------- yes no
28. I am nervous ---------- yes no
29. I have pretty eyes ---------- yes no
30. I can give a good report in front of the class ---------- yes no
31. In school I am a dreamer ---------- yes no
32. I pick on my brother(s) and sister(s) ---------- yes no
33. My friends like my ideas ---------- yes no
34. I often get into trouble ---------- yes no
35. I am obedient at home ---------- yes no
36. I am lucky ---------- yes no
37. I worry a lot ---------- yes no
38. My parents expect too much of me ---------- yes no
39. I like being the way I am ---------- yes no
40. I feel left out of things ---------- yes no
41. I have nice hair ---------- yes no
42. I often volunteer in school ---------- yes no
43. I wish I were different ---------- yes no
44. I sleep well at night ---------- yes no
45. I hate school ---------- yes no
46. I am among the last to be chosen for games ---------- yes no
47. I am sick a lot ---------- yes no
48. I am often mean to other people ---------- yes no
49. My classmates in school think I have good ideas ---------- yes no
50. I am unhappy ---------- yes no

51. I have many friends ---------- yes no
52. I am cheerful ---------- yes no
53. I am dumb about most things ---------- yes no
54. I am good looking ---------- yes no
55. I have lots of pep ---------- yes no
56. I get into a lot of fights ---------- yes no
57. I am popular with boys ---------- yes no
58. People pick on me ---------- yes no
59. My family is disappointed in me ---------- yes no
60. I have a pleasant face ---------- yes no
61. When I try to make something, everything seems to go wrong ---------- yes no
62. I am picked on at home ---------- yes no
63. I am a leader in games and sports ---------- yes no
64. I am clumsy ---------- yes no
65. In games and sports, I watch instead of play ---------- yes no
66. I forget what I learn ---------- yes no
67. I am easy to get along with ---------- yes no
68. I lose my temper easily ---------- yes no
69. I am popular with girls ---------- yes no
70. I am a good reader ---------- yes no
71. I would rather work alone than with a group ---------- yes no
72. I like my brother (sister) ---------- yes no
73. I have a good figure ---------- yes no
74. I am often afraid ---------- yes no
75. I am always dropping or breaking things ---------- yes no
76. I can be trusted ---------- yes no
77. I am different from other people ---------- yes no

78. I think bad thoughts ---------- yes no

79. I cry easily ---------- yes no

80. I am a good person ---------- yes no

APPENDIX B

ANXIETY SUBTEST

6. I am shy.
7. I get nervous when the teacher calls on me.
8. My looks bother me.
10. I get worried when we have tests in school.
20. I give up easily.
28. I am nervous.
37. I worry a lot.
40. I feel left out of things.
44. ,I sleep well at night.
55. I have lots of pep.
74. I am often afraid.
75. I cry easily.

APPENDIX C

TABLE: SCHOOL-AGE NORMS

TABLE XI

SCHOOL-AGE NORMS (GRADES 4 THROUGH 12) (N=1138)

Piers-Harris Raw Score	Percentile	Piers-Harris Raw Score	Percentile
80	43		24
78	42		23
77	44		27
79	41		21
76	99	40	20
75	98	39	18
74	97	38	17
73	96	37	15
72	95	36	14
71	94	35	13
70	93	34	12
69	91	33	11
68	89	32	10
67	87	31	9
66	85	30	8
65	82	29	7
64	79	28	6
63	77	27	6
62	74	26	5
61	71	25	5
60	69	24	4
59	66	23	3
58	63	22	3
57	60	21	2
56	57	20	2
55	55	19	2
54	52	18	1
53	49	17	
52	46	16	
51	44	15	
50	41	14	
49	38	13	
48	36	12	
47	33	11	
46	31	10	
45	29		

APPENDIX D

TABLE: RELIABILITY DATA

TABLE XII

RELIABILITY DATA

	Grade	Sex	N	Index	Coefficient
Pennsylvania Public Schools (Piers & Harris, 1964;95 items)	3	Girls	56	Kuder-Richardson	.90
	3	Boys	63	Kuder-Richardson	93
	6	Girls	56	Kuder-Richardson	.89
	6	Boys	71	Kuder-Richardson	.90
	10	Girls	53	Kuder-Richardson	.78
	10	Boys	64	Kuder-Richardson	.88
	6	Both	63	Spearman-Brown	.90
	10	Both	58	Spearman-Brown	.87
	3	Both	56	4 month test-retest	.72
	6	Both	66	4 month test-retest	.71
	10	Both	60	4 month test-retest	.72
Oregon Public Schools (Wing, 1966; 80 items)	5	Both	244	2&4 month test-retest	.77

APPENDIX E

PARENTAL CONSENT FORM

Dear Parent/Guardian:

The fifth grade students at our school have been chosen to participate in a research study pertaining to the relationship between one's physical fitness level and one's self-concept and anxiety level. With parental consent, the Piers-Harris Self-Concept Scale will be administered to all fifth grade students following the completion of the President's Challenge Fitness Test, which is part of our schools' physical education program. The information gathered will help physical educators at the local, state, and national levels improve their programs.

Completing the paper and pencil Piers-Harris Self-Concept Scale will pose no risk to your child. The 80-item questionnaire will ask about behavior, intellectual and school status, physical appearance, anxiety, popularity, and happiness. Procedures have been designed to protect your child's privacy and allow for anonymous participation. No names or other identifiers will be recorded on the answer sheets. No student will ever be mentioned by name in a report of the results. A copy of the questionnaire is available for your review at your child's principal's office.

This research proposal has been reviewed by the OSU Institutional Review Board, District Superintendent, School Principal, and School Physical Education Teacher.

Valid results depend on high participation rates among students in the fifth grade class. However, the decision to participate is voluntary and you and/or your child have the right to decline and no penalty shall occur.

If you have any questions please contact: Steve Lohmann, Instructor of Health and Physical Education, Box 206, Northwestern Oklahoma State University; (405) 327-1700 Ext. 234.

Please read the form below. Circle your response and return the form to the school within three days. Thank you for your cooperation. Keep one copy of this letter for yourself.

My child _____ may / may not
complete the Piers-Harris Self-Concept Scale.

_____ _____

Date Parent/Guardian's Signature

APPENDIX F

PRESIDENT'S CHALLENGE FITNESS TEST

Challenge Item	Fitness Component Measured
one-mile run/walk	heart/lung endurance
curl-ups	abdominal strength endurance
V-sit reach	lower back/hamstring flexibility
shuttle run	leg strength/endurance/power/ agility
pull-ups	upper strength/endurance

2

VITA

Steve Lynn Lohmann

Candidate for the Degree of

Doctor of Education

Thesis: **THE RELATIONSHIP BETWEEN PHYSICAL FITNESS AND ITS EFFECTS ON SELF-CONCEPT AND ANXIETY AMONG FIFTH GRADE STUDENTS**

Major Field: Educational Administration

Biographical:

Personal Data: Born in Alva, Oklahoma, September 6, 1956, the son of Mr. and Mrs. Arnold Lohmann.

Education: Graduated from Alva Senior High School in May of 1974; received Bachelor of Science in Education degree from Northwestern Oklahoma State University in May, 1978; received Master of Education degree from Northwestern Oklahoma State University in May, 1981; completed requirements for the Doctor of Education Degree at Oklahoma State University in December. 1993.

Professional Experience: Teacher and Coach (1-12), Alva Public Schools, Alva, Oklahoma, 1978-85; Assistant Football Coach and Head Track Coach, Northwestern Oklahoma State University, 1985-91; Instructor of Health and Physical Education, Northwestern Oklahoma State University, 1991-93, Assistant Professor of Health and Physical Education and Faculty Athletic Representative, Northwestern Oklahoma State University, 1993 to present.

Professional Organizations: Higher Education Alumni Council of Oklahoma (HEACO); Oklahoma Alliance for Health, Physical Education, Recreation and Dance (OAHPERD); American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD).