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SELF-CONCEPTIONS, PHYSICAL FITNESS FACTORS, SCHOOL ACHIEVEMENT AND THEIR INTERRELATIONS WITH SIXTH-GRADE STUDENTS

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Dedicated to:

Fred H. Green and John W. McClure

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TABLE OF CONTENTS

LIST OF TABLES

SELF-CONCEPTIONS, PHYSICAL FITNESS FACTORS, SCHOOL ACHIEVEMENT AND THEIR INTERRELATIONS WITH SIXTH-GRADE STUDENTS

CHAPTER I

INTRODUCTION

Researchers are continuously searching for relationship between certain variables, and the degree of their relative correspondence. Published research has frequently re-inforced the proposition that self-esteem is a variable that is significantly related to both physical achievement and academic achievement, in a positive manner. This study was concerned with comparing the differences in the mean scores, that represent sixth-grade students' self-esteem as performances on tests measuring physical fitness and academic achievement varied.

Also because of the emphasis placed on the importance of the general health of the child and his success in school, this study explored the relationships between factors of physical fitness and tests of academic achievement. There may be in existence certain physical fitness factors that load more heavily with academic achievement, and as a consequence the correspondence of the two domains is enhanced.

Kraus and Hirschland conducted comparative studies of European and American youth and found the American youth to be inferior to his European counterpart in general physical proficiency. These two researchers

purported the lack of sufficient exercise contributed a serious deficiency, and prevention of this deficiency was an urgent need. They claimed physical education needed a very definite expansion and active participation on a wider base, not only in high schools, but even more important in elementary schools.[1]

The impetus behind the fitness movement resulted from the findings of the Kraus-Weber test comparisons and other research that claimed American youth to be ignoring vigorous activities and, consequently possessing a lack of fitness.

> . . . . Six test movements appraising strength and flexibility of trunk and leg muscles were given to 4264 American and 2870 European children from comparable urban and suburban communities.[2]

	Austrian	Italian	Swiss	American
Number Tested	678.0	1036.0	1156.0	4264.0
Failure	9.5%	8.0%	8.8%	57.9%
Incidence of Failure	9.7%	8.5%	8.9%	80.0%

By exploiting these findings by the use of news media and winning the public sentiment, the project was given national concern and the American Association of Health, Physical Education, and Recreation created the AAHPER Youth Fitness Test.

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[1]Hans Kraus and Ruth P. Hirschland, "Muscular Fitness and Health," Journal of the American Association for Health · Physical Education · Recreation (December, 1953), XXIV, 17-19.

[2]Hans Kraus and Ruth P. Hirschland, "Minimum Muscular Fitness Tests in School Children," Research Quarterly, XXV (May, 1954), 178-188.

Statement of the Problem

The problem of this study was to determine whether significant differences exist between the self-esteem scores of sixth-grade students and their performance as measured by achievement and fitness tests.

Procedure

The primary procedure of this study was to determine the correlations that exist between the various combinations of the achievement test scores and fitness test scores for males, for females, and for both males and females. Of equal importance in this study was to determine the extent self-esteem scores differ, as the academic achievement and fitness scores change from high to low.

The sample consisted of three-hundred and six sixth-grade males and females whose ages were eleven and twelve inclusive. These students were from Midwest City Public Schools of Midwest City, Oklahoma, and were enrolled in the sixth grade for the regular school year 1969-1970. The participating elementary schools were Country Estates Elementary School, Eastside Elementary School, and Townsend Elementary School.

The AAHPER test was chosen to be the tool employed to measure physical fitness of the children of this study as it is relatively comprehensive and efficient. The term physical fitness as measured by this test is an operational term and is contingent upon the performance capacities of each individual child as evaluated by the battery of fitness tests consisting of pull-ups, sit-ups, shuttle run, standing broad jump, 50-yard dash, softball throw, and 600-yard run-walk.

The Iowa Test of Basic Skills was the tool used to measure academic achievement of the students, and the various sub-test scores reported were vocabulary, reading, language, work-study, arithmetic and composite. By using the Iowa tests as a tool to differentiate academic achievement, much of the subjectivity was eliminated and variables like personality and appearance that have a tendency to influence teacher nomination were controlled.

There is a tendency for teachers to make judgments on the basis of superficial characteristics. Teachers tend to overestimate the ability of youngsters who are well-dressed, well-groomed, and polite and to underestimate the ability of many children whose intellectual skills might be masked by a hostile attitude, disinterested parents, or an unkept and untidy personal appearance.[1]

Pegnato and Birch report on the accuracy of teacher nomination in a study to determine the effectiveness of different measures of identification of gifted children in a junior-high school. They found teacher judgment to be the poorest identifier of giftedness, as compared with group achievement tests, group intelligence tests, and even honor rolls.[2]

The achievement sub-tests composed of vocabulary, reading comprehension, language skills, work-study skills, arithmetic skills, and a composite score was paired with the Youth Fitness sub-tests of pull-ups, sit-ups, shuttle run, standing broad jump, 50-yard dash, softball throw and

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[1]James J. Gallagher, Teaching the Gifted Child (Boston: Allyn and Bacon, Inc., 1964), pp. 8-9.

[2]C. Pegnato and J. W. Birch "Locating Gifted Children in Junior High Schools: A Comparison of Methods," Exceptional Children, XXV (March, 1959), 300-304.

600-yard run-walk in every possible combination for males and females and both males and females inclusive. A correlation coefficient was computed for each of the 126 fitness-achievement combinations, in order to study the relationships between the variables.

The inventory used to measure self-esteem was developed by Coopersmith from items selected and reworded from the "Rogers and Dymond scale."[1] The Self-Esteem Inventory, referred to as the S. E. I. Short-Form, came from a perspective of the individual and is concerned with items dealing with general self, social self-peers, home-parents, and school-academics. This scale gives a composite picture of the self-standard. There are thirty-seven positive indicators on the "like me" side, indicating the well-adjusted person and thirty-seven negative indicators on the "unlike me" side. A person's resemblance to this ideal type is determined by the degree he describes himself in accordance with the way the hypothetically well-adjusted person would. The S. E. I. items are divided into two groups, by agreement of a team of psychologists, and the subject checks "like me" or "unlike me" to indicate behavior as like or unlike his ideal self.[2]

The correlates analyzed in regard to self-esteem were the various combinations of physical fitness factors and achievement that yielded the highest correlation for males, for females, and for both males and females.

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[1]Rosalind F. Dymond, "Adjustment Changes over Therapy from Self-Sorts" in Psychotherapy and Personality Change, ed. by Carl Rogers and Rosalind F. Dymond (Chicago: The University of Chicago Press, 1954), pp. 77-79.

[2]Ruth C. Wylie, The Self Concept, A Critical Survey of Pertinent Research Literature (Lincoln, Neb.: University of Nebraska Press, 1961), p. 88.

The mean self-esteem score for the qualifying groups was compared statistically to determine significant differences.

Sub-groups were extracted from the qualifying correlates and were analyzed in order to determine the extent to which self-esteem was significant. The 60th percentile and greater, was the criterion considered for high scores on the academic achievement test and the physical fitness test. The 40th percentile and less was the criterion considered for low scores on the academic achievement test and the physical fitness test. All of the scores that met the above criteria, from the qualifying correlates, were included in these samples. Sub-groups of high achievement-high physical fitness, high achievement-low physical fitness, high physical fitness-low achievement, and low achievement-low physical fitness were observed in all possible combinations to determine if there were significant differences between the various groups in regard to self-esteem.

Correlation for the relationships between the six section scores on the achievement test and the seven section scores on the physical fitness test were identified for each of the three groups composed of males, females, and the total group as follows:

(1) Achievement score on vocabulary with fitness score on pull-ups.

(2) Achievement score on vocabulary with fitness score on sit-ups.

(3) Achievement score on vocabulary with fitness score on shuttle run.

(4) Achievement score on vocabulary with fitness score on standing broad jump.

(5) Achievement score on vocabulary with fitness score on 50-yard dash.

(6) Achievement score on vocabulary with fitness score on softball throw.

(7) Achievement score on vocabulary with fitness score on 600-yard run-walk.

(8) Achievement score on reading comprehension with fitness score on pull-ups.

(9) Achievement score on reading comprehension with fitness score on sit-ups.

(10) Achievement score on reading comprehension with fitness score on shuttle run.

(11) Achievement score on reading comprehension with fitness score on standing broad jump.

(12) Achievement score on reading comprehension with fitness score on 50-yard dash.

(13) Achievement score on reading comprehension with fitness score on softball throw.

(14) Achievement score on reading comprehension with fitness score on 600-yard run-walk.

(15) Achievement score on language skills with fitness score on pull-ups.

(16) Achievement score on language skills with fitness score on sit-ups.

(17) Achievement score on language skills with fitness score on shuttle run.

(18) Achievement score on language skills with fitness score on standing broad jump.

(19) Achievement score on language skills with fitness score on 50-yard dash.

(20) Achievement score on language skills with fitness score on softball throw.

(21) Achievement score on language skills with fitness score on 600-yard run-walk.

(22) Achievement score on work-study skills with fitness score on pull-ups.

(23) Achievement score on work-study skills with fitness score on sit-ups.

(24) Achievement score on work-study skills with fitness score on shuttle run.

(25) Achievement score on work-study skills with fitness score on standing broad jump.

(26) Achievement score of work-study skills with fitness score on 50-yard dash.

(27) Achievement score of work-study skills with fitness score on softball throw.

(28) Achievement score on work-study skills with fitness score on 600-yard run-walk.

(29) Achievement score on arithmetic skills with fitness score on pull-ups.

(30) Achievement score on arithmetic skills with fitness score on sit-ups.

(31) Achievement score on arithmetic skills with fitness score on shuttle run.

(32) Achievement score on arithmetic skills with fitness score on standing broad jump.

(33) Achievement score on arithmetic skills with fitness score on 50-yard dash.

(34) Achievement score on arithmetic skills with fitness score on softball throw.

(35) Achievement score on arithmetic skills with fitness score on 600-yard run-walk.

(36) Composite achievement score with fitness score on pull-ups.

(37) Composite achievement score with fitness score on sit-ups.

(38) Composite achievement score with fitness score on shuttle run.

(39) Composite achievement score with fitness score on standing broad jump.

(40) Composite achievement score with fitness score on 50-yard dash.

(41) Composite achievement score with fitness score on softball throw.

(42) Composite achievement score with fitness score on 600-yard run-walk.

Assumptions

(1) That physical fitness is defined in terms of performance of a set of seven tasks.

(2) That the self-esteem inventory score was an accurate quantitative assessment of how the individual actually perceived himself, and that the children answered the questionnaire with honesty and integrity.

(3) That academic achievement was measured comprehensively by the Iowa Test of Basic Skills.

(4) That the scores reported in the study from the various domains were from populations with normal distributions.

Limitations

(1) The study was limited by measuring academic achievement by a quantitative test score. It is important for teachers to reflect that what we call "achievement" in our school children is determined mainly by the construction of what we call achievement tests. Until we can become more effective constructors of achievement tests which measure depth of understanding as well as breadth, these skyrocketing achievement scores may mean much less than we would like them to mean.[1]

(2) The study was limited by physical fitness being determined by AAHPER Youth Fitness Test Scores. The discovery of the precise relations between performance capacities, specific physiological indices, and health, in its organic and functional meaning, should be the objective of

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[1]Gallagher, Teaching the Gifted Child, pp. 31-33.

concerted research efforts. Such research should lead to a broader concept of physical fitness, its components, and their relationship.[1]

(3) The study was limited to 306 sixth-grade students ages eleven and twelve of Midwest City Public Schools during the school year 1969-70.

(4) The study was limited by attempting to measure the difficult personality variable, self-esteem. The validity of the S. E. I. centers around a judgmental process in which the individual examines his performance, capacities and attributes according to his personal standards. Whether or not the individual expresses his feelings honestly will have a definite effect on the accuracy of the tool to measure self-esteem.[2]

Hypotheses

The general hypothesis assumed that there were no significant differences in the means of self-esteem between the qualifying sub-groups of high achievement-low physical fitness, low achievement-high physical fitness, high achievement-high physical fitness and low achievement-low physical fitness, for boys, girls, and total group in all possible combinations.

The general hypothesis included eighteen specific hypotheses. The experiment involved the testing of these hypotheses.

Males

(1) There is no statistically significant difference between the mean score of self-esteem for male students with selected high physical

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[1]Edwin A. Fleishman, The Structure and Measurement of Physical Fitness (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1964), p. 154.

[2]Stanley Coopersmith, The Antecedents of Self-Esteem (San Francisco: W. H. Freeman & Co.: 1967), pp. 6-7.

fitness-low achievement skills and the mean score of self-esteem for male students with selected high physical fitness-high achievement skills.

(2) There is no statistically significant difference between the mean score of self-esteem for male students with selected high physical fitness-low achievement skills and the mean score of self-esteem for male students with selected low physical fitness-high achievement skills.

(3) There is no statistically significant difference between the mean score of self-esteem for male students with selected high physical fitness-low achievement skills and the mean score of self-esteem for male students with selected low physical fitness-low achievement skills.

(4) There is no statistically significant difference between the mean score of self-esteem for male students with selected high physical fitness-high achievement skills and the mean score of self-esteem for male students with selected low physical fitness-high achievement skills.

(5) There is no statistically significant difference between the mean score of self-esteem for male students with selected high physical fitness-high achievement skills and the mean score of self-esteem for male students with selected low physical fitness-low achievement skills.

(6) There is no statistically significant difference between the mean score of self-esteem for male students with selected low physical fitness-high achievement skills and the mean score of self-esteem for male students with selected low physical fitness-low achievement skills.

Females

(7) There is no statistically significant difference between the mean score of self-esteem for female students with selected high physical

fitness-low achievement skills and the mean score of self-esteem for female students with selected high physical fitness-high achievement skills.

(8) There is no statistically significant difference between the mean score of self-esteem for female students with selected high physical fitness-low achievement skills and the mean score of self-esteem for female students with selected low physical fitness-high achievement skills.

(9) There is no statistically significant difference between the mean score of self-esteem for female students with selected high physical fitness-low achievement skills and the mean score of self-esteem for female students with selected low physical fitness-low achievement skills.

(10) There is no statistically significant difference between the mean score of self-esteem for female students with selected high physical fitness-high achievement skills and the mean score of self-esteem for female students with selected low physical fitness-high achievement skills.

(11) There is no statistically significant difference between the mean score of self-esteem for female students with selected high physical fitness-high achievement skills and the mean score of self-esteem for female students with selected low physical fitness-low achievement skills.

(12) There is no statistically significant difference between the mean score of self-esteem for female students with selected low physical fitness-high achievement skills and the mean score of self-esteem for female students with selected low physical fitness-low achievement skills.

Total Group

(13) There is no statistically significant differences between the mean score of self-esteem for male and female students with selected high

physical fitness-low achievement skills and the mean score of self-esteem for male and female students with selected high physical fitness-high achievement skills.

(14) There is no statistically significant difference between the mean score of self-esteem for male and female students with selected high physical fitness-low achievement skills and the mean score of self-esteem for male and female students with selected low physical fitness-high achievement skills.

(15) There is no statistically significant difference between the mean score of self-esteem for male and female students with selected high physical fitness-low achievement skills and the mean score of self-esteem for male and female students with selected low physical fitness-low achievement skills.

(16) There is no statistically significant difference between the mean score of self-esteem for male and female students with selected high physical fitness-high achievement skills and the mean score of self-esteem for male and female students with selected low physical fitness-high achievement skills.

(17) There is no statistically significant difference between the mean score of self-esteem for male and female students with selected high physical fitness-high achievement skills and the mean score of self-esteem for male and female students with selected low physical fitness-low achievement skills.

(18) There is no statistically significant difference between the mean score of self-esteem for male and female students with selected low

physical fitness-high achievement skills and the mean score of self-esteem for male and female students with selected low physical fitness-low achievement skills.

Treatment of the Data

Correlation coefficient was used to describe the degree of relation between the two variables, academic achievement and physical fitness. Pearson product-moment correlation coefficient was used to measure the correlation of this study, for the 126 combinations of achievement scores and fitness scores for boys, girls, and total group.

The influence on self-esteem by academic achievement scores and physical fitness scores was determined by computing the "t" test for each of the eighteen specific hypotheses related to the general hypothesis. The specific hypothesis was assuming there are no significant differences between the mean scores of the qualifying sub-groups' self-esteem. Prerequisite to the selection of an independent "t" test, "F" tests were computed to determine the differences between the variances of the independent samples. Variance ratio considerations, and sample size equality were the criteria used for the "t" test selection in this study. The .05 level of significance was used to determine if the "t" values were significant.

Definition of Terms

Physical Fitness.[1] The functional capacity of individuals to perform certain kinds of tasks requiring muscular activity.

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[1]Fleishman, The Structure of Physical Fitness, p. 154.

Self-Concept.[1] The self, that organized consistent conceptual gestalt composing of perceptions of the characteristics of the "I" or "me," and the perceptions of the relationships of the "I" or "me" to others and to various aspects of life, together with the values attached to these perceptions.

Dynamic Strength.[2] The strength of muscles in the limbs in moving or supporting the weight of the body repeatedly over a given period of time (measured by pull-ups, sit-ups, and flexed-arm hang).

Explosive Strength.[3] The ability to exert maximum energy in one explosive act (measured by shuttle run, softball throw, 50-yard dash and standing broad jump).

Stamina.[4] Cardio-vascular endurance, measurable only by prolonged exertions of the whole body (measured by 600-yard run-walk).

AAHPER Youth Fitness Test.[5] A construct of the American Association for Health, Physical Education, and Recreation, a Department of the National Education Association of the United States.

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[1]Carl R. Rogers, "A Theory of Therapy, Personality, and Inter-Personal Relationships, as Developed in the Client-Centered Framework," Psychology: A Study of Science, Three: Formulations of the Person and the Social Contest, ed. by S. Koch (New York: McGraw-Hill Book Co., 1959), pp. 184-256.

[2]Fleishman, The Structure of Physical Fitness, p. 30.

[3]Ibid., p. 29.

[4]Ibid., p. 36.

[5]AAHPER Youth Fitness Test Manual (Rev. ed.; Washington, D. C.: American Association for Health, Physical Education and Recreation, 1965).

Iowa Test of Basic Skills. An analytical battery of tests emphasizing vocabulary, reading comprehension, language skills, work-study skills, arithmetic skills and composite scores.

Self-Esteem.[1] The degree of correspondence between an individual's ideal and actual concepts of himself, and concerns the amount of value an individual attributes to various facets of his person.

Summary

This study gives insight into the relationship between academic achievement and factors of physical fitness. Of primary interest was to observe how self-esteem is influenced by various combinations of high and low performances in achievement and physical fitness.

The data for this study were taken from the Midwest City Public School system of Midwest City, Oklahoma, as follows:

(1) During November, 1969, the Iowa Tests of Basic Skills were administered to the sixth-grade students and these were the academic achievement scores used in this study.

(2) During February, 1970, the AAHPER Youth Fitness Test was administered to the sixth-grade students and these were the physical fitness scores used in this study.

(3) During February, 1970, the Self-Esteem Inventory (S. E. I.) was administered to the sixth-grade students and these were the self-esteem scores used in this study.

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[1]Arthur R. Cohen, "Some Implications of Self-Esteem for Social Influence," Personality and Persuasibility, ed. by Carl I. Hoveland and Irving L. Janis (New Haven: Yale University Press, 1966), p. 103.

(4) Three hundred and six sixth-grade students participated in the study and only those eleven and twelve years old were used in the sample. There were 161 males and 145 females that were tested.

(5) Academic achievement scores, fitness test scores and self-esteem scores comprise the data used in this study.

CHAPTER II

REVIEW OF LITERATURE

Introduction

This chapter presents a review of research and theory related to factors of self-concept, physical fitness, and school achievement, which permits insight into determining the interrelationship among the variables. Theoretical and historical presentations were employed to give insights into self-conceptions and physical fitness variables, while academic achievement was reviewed through the perspective of the Iowa Tests of Basic Skills. Selected studies showing the various interrelationships among physical fitness, self-concept factors and school achievement are cited at the end of this chapter.

Self-Concept Phenomenon

Self defined in an objective manner is difficult because few people interpret their social and physical environment the same way. Consequently the way an individual views himself is dependent upon the psychoanalytic concept which emphasized the unconscious aspects of our inner world, and the genetic interpretations of self which stress maturation, growth and experience.[1]

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[1]Louis Kaplan, Foundations of Human Behavior (New York: Harper & Row Publishers, 1965), p. 124.

Freud structured the personality around the id, the ego, and the superego. He regarded the id as the product of a person's biological endowment, the ego as the result of interaction with objective reality in the higher mental processes, and the superego as the product of socialization. The term in Freudian psychology, that is closest to self-concept, would be the construct of the ego composed of the three major systems just described. Self-concept is explained by Adler as being the continual interaction between the child and his environment and his evaluation of it. Adler believed that all of the child's behavior is a result of his life style or self-concept. Each child's style of life guides all of his actions in accordance with his goals and purposes. The child's perception determines his behavior more than the so-called reality of the situation.[1]

Jung believed that purpose and aim play important roles in personality development by stages that are expressed in terms of goals. The gamut being from mere survival in infancy, through the dominance of sexual expression in adolescence, to the level of cultural, philosophical and spiritual goals in maturity.[2]

A theoretical reference of self which agrees with the philosophy of this study comes from Combs and Snygg as they define the perceived self as the individual's own unique organization of ways of regarding himself.[3]

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[1]Raymond F. Gale, Developmental Behavior, Humanistic Approach (London: MacMillan Company, 1969), pp. 27-29.

[2]Luella Cole, Psychology of Adolescence (New York: Holt, Rinehart and Winston, 1961), pp. 306-307.

[3]Arthur Combs and Donald Snygg, Individual Behavior: A Perceptual Approach to Behavior (Rev. ed.; New York: Harper & Row, 1959), pp. 126-34.

"Self" is not a mere conglomeration of isolated concepts, but a patterned interrelationship of the way we are treated by those who surround us; in our earliest years by our families and in later years by all those people with whom we come in contact. Because of these varying relations with others, people are continually discovering and rediscovering themselves. From this review of self-concept it is clearly understood that it is a multi-dimensional term. This chapter did not attempt to analyze the multi-dimensional constellation of all the personality concepts in their entirety, but rather to focus on one dimension, and that being the attitude which the individual holds toward himself.

Self-attitudes should not be confused with the emotional pre-dispositions that cause people to act in characteristic ways in certain situations, but rather the object of consideration is "each person," as a unique individual. Each person being construed unique from a self-evaluation standpoint.

The attitudes that a child holds towards himself is largely derived from the reflected appraisal of others. Each child carries within himself the reflectory mirror of his social group and as he observes how he is regarded, he values himself accordingly. If priority people in his life treat him in a positive way, then he places a high value on himself, but if priority people in his life give him negative re-inforcement, then he regards himself lowly. If he cannot live up to the expectations of his parents, he has little opportunity to develop a positive conception of himself.[1]

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[1]Kaplan, Foundations of Human Behavior, pp. 123-145.

The Self-Esteem Inventory was developed by Coopersmith in 1959, and most of the items came from the "Rogers and Dymond Scale." The "Rogers and Dymond Scale" utilizes an adjustment score and was devised to provide an external criterion of adjustment level. To obtain the adjustment criterion, a group of statements was given to practicing clinical psychologist, and they were asked to differentiate those the well-adjusted person should say are like him and those the well-adjusted person should say are unlike him. The composite picture of the self-description of the well-adjusted person was determined from thirty-seven "like me" positive indicators and thirty-seven "unlike me" negative indicators. A person's resemblance to this ideal type is computed by counting the number of these seventy-four items which he places on the same end of the distribution, when he sorts to describe himself, as the hypothetically well-adjusted person would. The "adjustment score," as the previously described tally is referred to, was used in an attempt to ascertain the effects of therapy on an experimental group, as contrasted to a control group. The pre- and post-test design helped to demonstrate the degree of profit derived from counseling. These findings confirmed that the mean adjustment score of the total experimental group after therapy was significantly higher than their pre-therapy score. Before attributing the difference to therapy, all other possible explanations of the significant improvement should be considered.[1]

The review of the "Rogers and Dymond Scale" affords a basis for a better understanding of the Self-Esteem Inventory (S. E. I.), used in this

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[1]Dymond, "Adjustment Changes over Therapy," pp. 77-79.

study and designed by Coopersmith in 1959. There are two forms of the S. E. I., Form A and Form B.

Form A contains fifty-eight items and a total of five subscales. It provides a general assessment of self-esteem which may be broken down into component subscales depending on the goals and interest of the examiner, but which may be used without such differentiation. These four subscales (excluding the lie scale) which cycle in sequence the gamut of the S. E. I. are: general self, social self-peers, home-parents, and school-academic.

Form B contains twenty-five items with no subscales, and is based on an item analysis of Form A, which included those twenty-five items that showed the highest item-total score relationships of scores obtained with Form A. The responses indicating high self-esteem report a maximum score of twenty-five.

In validating the S. E. I., the inventory was initially administered to two fifth- and sixth-grade classes, of both males and females. The score possibilities ranged from zero to 100, as each of the fifty responses carried a point value of two. The actual scores ranged from forty to 100, with a mean of 82.3 and a S. D. of 11.6. The mean score for the forty-four males was 81.3, S. D. of 12.2; the mean score of the forty-three females was 83.3, S. D. of 16.7. Later the S. E. I. was administered to one of the fifth-grade classes in order to check the test-retest reliability, and it was found that with a sample of thirty fifth-grade children, the reliability was .88, after a five-week time lapse. A subsequent sample of 1,748 children with diverse interests, abilities, and social backgrounds shows a mean

for the males was 70.1, S. D. 13.8 and a mean for the females of 72.2, S. D. 12.8. Test-retest reliability after a three-year interval with a sample of fifty-six children from this population was .70. From these research findings both studies reported to be skewed in the direction of high self-esteem and the mean for males was not significantly different from that of the females.[1] This implies a lack of sex skewness. The validity of the S. E. I. centers around a judgmental process in which the individual examines his performance, capacities and attributes, according to his personal standards. Whether or not the individual expresses these feelings honestly will influence the accuracy of this study, but any attempt to measure in the affective domain will meet with similar circumstances, as the measurement of attitudes is an arduous task.

Items in the S. E. I. include statements relative to school, family, peers, self, and general social activities. In this study no attempt was made to differentiate between the various experience areas. Coopersmith made an analysis of the tests of fifty-six children and found no significant differences between the self-appraisals for the different areas.[2]

The S. E. I. is concerned with an overall general appraisal of worthiness as influenced by success or failure in the realms of achievement and physical fitness. Hopefully the diverse experience areas covered on the S. E. I. will aid the attempt to measure accurately each individual's perception of self.

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[1] Stanley Coopersmith, The Antecedents of Self-Esteem (San Francisco: W. H. Freeman & Co., 1967), p. 10.

[2] Ibid.

Selected studies are presented at the end of this chapter which present how the published literature considers self-esteem to relate to academic achievement and physical achievement. The selected studies are samples that are representative of the position assumed by the literature of how these variables show a positive relationship.

Physical Fitness Phenomenon

Physical fitness is another variable that merits concern and while one definition is used to describe it as the condition of the body necessary for performing various tasks, it transcends these boundaries. The concepts that underlie physical fitness are composed of those qualities necessary for the individual to function efficiently and happily in the environment.[1]

Dauer lists a number of these concepts as:

(1) Enough strength, ability, flexibility, speed and endurance to do easily and effectively the routine duties and maximum tasks that the day may bring. This means living as a vigorous organism and implies organic fitness.

(2) Freedom from disease and removable handicapping disorders.

(3) A sturdy physique which means a well-developed body with posture habits. Evidence of good nutritional habits should be present.

(4) He comes to the end of the day sleepy but not overly tired and is able to sleep well and feel recovered in the morning from the activities of the preceding day.

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[1]Victor P. Dauer, Fitness for Elementary School Children Through Physical Education (Minneapolis, Minn.: Burgess Publishing Co., 1962), p. 3

Physical fitness is freedom from chronic disease, possessing good teeth, good hearing, good eyesight and normal mentality. It is the ability to handle the body well and the capacity to work hard over a long period of time without diminished efficiency. Approaches for objective testing should include appraisal of physique, organic efficiency, and motor fitness.[1] Physical fitness is a variable that possesses a degree of ambiguity, as there are many different concepts associated with the term. Many times the term is defined in regard to the dimension of physical fitness that is being measured. This is by necessity as there is no all-inclusive tool in existence that measures every facet of physical fitness.

The problem of an inadequate tool for measuring physical fitness in all its dimensions has been the case for many years. In 1924 after examining various tests of physical fitness, it was concluded that there was no single test to measure fitness, because most measured only some of the components of fitness.[2]

Due to the varied dimensions that are associated with fitness, a current assessment reveals that there is still no single measuring tool for all aspects of fitness. A variety of fitness philosophies still prevail, and there are still many unanswered questions. The AAHPER battery of fitness

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[1]Thomas Kirk Cureton, Physical Fitness Appraisal and Guidance (St. Louis: The C. V. Mosby Co., 1947), pp. 18-21.

[2]V. D. Collins and E. C. Howe, "The Measurement of Organic and Neuromuscular Fitness," American Physical Education Review, XXIX (February, 1924), 64-70.

tests have performed a valuable function, but they have been regarded as interim measures pending more extensive research.[1]

Physical fitness itself is a broad quality involving medical and dental supervision and care, immunization and other protection against disease, proper nutrition, adequate rest, relaxation, good health practices, sanitation and other aspects of healthful living. Exercise is an essential element to achieving physical fitness. Strength, stamina, endurance and other desirable physical qualities are best developed through vigorous activity. Physical fitness is achieved through a sensible balance of all these provisions adapted to age, maturity, and capability of the individual.[2]

Exercise is an essential element to physical fitness and the majority of the measuring devices attempted to assess value in regard to performance. In this type of measurement, skill is a variable that is not easily controlled and it is questionable whether ability to perform a particular task should influence the fitness score.

The modern concept of assessing is a functional one which recognizes the fact that there are certain factors which aid or hinder the functional performance. Some of these factors are age, weight, height, and body build.

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[1]Fleishman, The Structure of Physical Fitness, pp. 150-152.

[2]President's Council on Physical Fitness, Youth Physical Fitness Suggested Elements of a School-Centered Program; Parts One and Two, (Rev. ed. January, 1967), iii.

All factors must be considered when attempts are made to identify the causes underlying physical performance.[1]

The existence of varied concepts underlying physical fitness is prevalent in the literature, but there is a marked degree of consistency showing physical exercise as a common element of physical fitness. The controversy seems to be associated with the elements that comprise the term physical fitness and an acceptable and accurate tool for measuring it, in its gestault. By reporting research findings, the authoritative differences are exposed and also insights are afforded into the elements that experience commonness. A systematic approach is to determine the earliest times in history where physical education was of concern and follow its progress and treatment to the present time.

The Greeks and Romans were one of the first people to give physical education an important place in the educational program. They were cognizant of its utilitarian value in times of war, and many of the present philosophical ideas controlling the modern programs date back to this early era.[2]

The Greeks emphasized the educational aspects of exercise and because physical fitness played such an important factor in the Greek culture, they instigated the Olympic games. The Romans differed from the Greeks,

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[1]Leonard A. Larson and Rachael Dunoven Yocom, Measurement and Evaluation in Physical Health and Recreation Education (St. Louis: The C. V. Mosby Co., 1951), p. 155.

[2]N. P. Neilson and Winifred Van Hagen, Physical Education for Elementary Schools (New York: A. S. Barnes and Co., 1932), p. 1.

as they gave priority to military games and exercises and these professional exhibitions were practiced at the exclusion of other sporting contests.[1]

The primitive people received most of their exercise through the ordinary daily pursuits that were necessary for them to earn a livelihood. The dance was a form of fitness activity where the warrior imitated in pantomime fashion forces of nature or the hunting pursuit. The middle ages had a place reserved for physical fitness activities, but most of the recreational activities were impregnated with a strong religious motive and most of the activities carried the sanctions of the church. Chivalric education not only had recreational implication, but other aims were to train the youths to be strong in character and in body in order to defend the holy region. Physical education was introduced into the schools of this country about the time of the Civil War, but most recreation and sports activities were reserved for the wealthy. The chief argument used in favor of physical education, as a school discipline, was to supplant the physical work or chores that the city boys no longer had to perform.[2]

The oldest program of evaluating physical fitness is the anthropometrical and dynamometer strength testing program. From 1884-1905 various applications were made of dynamometer tests to show that strength increased with exercise, food, rest, and barometric pressure; while fatigue, smoking, hunger, low atmospheric pressure and high temperature accompanied by high humidity lowered strength and endurance in strength exercise.[3]

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[1]Don Cash Seaton, et al. Physical Education Handbook (New York: Prentice-Hall, Inc., 1951), p. 3.

[2]Ibid., pp. 4-5.

[3]Cureton, Physical Fitness Guidance, p. 30.

In 1913, Sargent purported that strength was a desirable objective and was probably the most important of the early measured qualities indicating physical fitness. About the same time at the University of London in England, the pioneering work in the evaluation of functional heart tests were gaining impetus.[1]

During this time there was a wave of interest in standards of fitness, and a great deal written about the methods of measurement to determine the degree of fitness. The performance oriented authorities considered general motor efficiency, with emphasis on agility and big muscle coordination, as the ultimate test of fitness. The measurement of strength in its various forms was considered to be indicators of health, vigor and fitness.[2] Other authorities based fitness on physiological work principles and measurement of this phenomenon consisted of a highly complex apparatus used to determine cardiovascular functioning.

Medical departments of insurance companies and military investigation committees attempted to develop and standardize fitness tests as the universal cry was that there was a need for a test that would measure, objectively, the fitness of the body as a whole and accurately differentiate fitness quality. An attempt at this was the motor fitness tests that

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[1] Ibid., p. 31.

[2] M. Gladys Scott and Ester French, Better Teaching Through Testing (New York: A. S. Barnes and Co., 1945), pp. 109-110.

emphasized vigorous physical activity and its underlying factors of strength, speed, agility, endurance, and power.[1]

Branches of the Armed Forces have emphasized the role of tests in their physical fitness programs, as they are perpetually evaluating their training program as a means of adequately preparing soldiers for combat service. Many of the military fitness programs are concerned with providing better measures of the fitness factors that comprise the phenomenon.[2]

The American Association for Health, Physical Education, and Recreation have had an interest in fitness since their professional organization began in 1885. Traditionally the trend has been towards more interest during war years and a drop-off following the cessation of hostilities.[3]

Kraus and his associates did much to revitalize an interest in fitness with their comparative studies of American and European children. One report stated an eight percent incidence of failure for European children on the Kraus-Weber Test, while the American incidence of failure was 56.6 percent.[4]

As a result of these international comparison studies, President Eisenhower called a Conference on Fitness of American Youth in June of 1956, and from this conference came the President's Council on Youth

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[1]H. Harrison Clark, Application of Measurement to Health and Physical Education (New York: Prentice-Hall, Inc., 1953), p. 192.

[2]Col. Theodore P. Bank, "The Army Physical Conditioning Program," Journal of Health & Physical Education, XIV No. 4 (April, 1943), 195.

[3]AAHPER Youth Fitness Test Manual, (Washington, D. C.: American Association for Health, Physical Education, and Recreation, A Department of the National Education Association of the United States, 1958), p. 1.

[4]Kraus and Hirchland,"Muscular Fitness," pp. 17-19.

Fitness. An AAHPER Research Council was given the responsibility for the initial planning of the AAHPER Youth Fitness Project. Two of their primary tasks were to devise and agree upon a test battery and then collect a nationwide sample of test results that were representative of American youth. The first edition of the AAHPER Youth Fitness Test Manual appeared in October of 1958. There seemed to be immediate enthusiasm towards optimum fitness with a concerted effort by business, industry, and education. Fitness like fashion became the vogue with emphasis on exercise. The AAHPER test program impetus spread to foreign countries and more international comparisons were being made. A comparison of British and American boys and girls showed a poor picture of physical fitness for the Americans, and also a study of 20,000 Japanese youth revealed they were superior in almost every test element.[1]

President Kennedy used his influence and interests to alleviate the "soft American" image and called attention to the problem in an article that he wrote for Sports Illustrated Magazine.

> The physical vigor of our citizens is one of American's most precious resources. If we waste or neglect the resource, if we allow it to dwindle or grow soft, then we will destroy much of our ability to meet the great and vital challenges which confront our people.[2]

The President's Council on Physical Fitness, set up by President Eisenhower, was expanded under President Kennedy, and was continued under

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[1] AAHPER Youth Fitness Test Manual, 1958, pp. 1-4.

[2] John F. Kennedy, "The Soft Americans," Sports Illustrated (December 26, 1960), p. 57.

President Johnson. The status quo of Johnson seems to be employed by President Nixon at the present time.

The data for the first national survey were collected and analyzed during the school year of 1957-58. The test and the national norms were published by the AAHPER in September 1958 and the scores included test results for 8,500 boys and girls in grades five through twelve.[1]

The original test battery consisted of seven test items which consist of pull-up (for boys), modified pull-up (for girls), sit-up, standing broad jump, shuttle-run, 50-yard dash, softball throw for distance, and the 600-yard run-walk. The seven test items may be given in the gymnasium, or outdoors but only after each child has received a physicians' approval to participate.[2]

Improvement in the test items, the test norms, and its application has evolved through the last six years. The international comparative studies show our young people do not have the shoulder and upper-arm strength or the endurance revealed by young people of many other countries even though our nutrition and health standards are higher.[3]

Many authorities believe the inferiority of the American youth has been overstated and more emphasis should be placed on studies relating to the environmental, cultural, training, and genetic factors that influence

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[1] AAHPER Youth Fitness Test Manual, (Rev. ed.), 1965, pp. 8-9.

[2] AAHPER Youth Fitness Test Manual, 1958, p. 5.

[3] AAHPER Youth Fitness Test Manual, (Rev. ed.), 1965, p. 9.

the test results.[1] Often these international comparison studies were based on too few tests or on unspecified standards. A major problem was the lack of comparability of public education between countries.

The test battery itself was modified slightly in the revised fitness manual, as the flexed-arm hang has been substituted for the modified pull-up for girls. The authorities believe the flexed-arm hang to be a more efficient and reliable measure of girls' arm and shoulder girdle strength. The scoring of this item changed from recording the completed number of pull-ups, to the nearest whole number to recording in seconds the length of time the subject holds the hanging position. The new national norms appear in the 1965 Revised Edition of the AAHPER Youth Fitness Manual. The 1965 percentile scores for every test at every level is higher or remains the same as compared to the 1958 AAHPER Youth Fitness Manual scores. The goals were to raise the norms to even higher levels. The higher norms indicate that boys and girls age ten to seventeen, are generally more fit today, as measured by the AAHPER Youth Fitness Test, than they were seven years ago.[2]

The test items administered during the second survey were constant to those given in 1957-58 with one exception and that being the substitution of the flexed-arm hang for the modified pull-up for girls. The data were collected during the school years 1963-64 and 1964-65 and approximately 9,200 boys and girls (age ten to seventeen) participated in the revision of the norms. The AAHPER Youth Fitness Test Battery used in this study

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[1] Fleishman, The Structure of Physical Fitness, pp. 151-152.

[2] AAHPER Youth Fitness Test Manual, (Rev. ed.), 1965, pp. 5-14.

consists of seven test items, with detailed instructions for administering each item provided. The recommended order for administering the test items is pull-up for boys, flexed-arm hang for girls, sit-up, shuttle run, and standing broad jump be given in one period; with the 50-yard dash, softball throw for distance and 600-yard run-walk in a second period.[1]

The pull-up for boys is recorded in number completed to the nearest whole number. The pupil assumes the hanging position (palms away from the body) from the bar and he raises his body by his arms until his chin can be placed over the bar. He then lowers his body to a full hang and then repeats the exercise as many times as possible.

The flexed-arm hang for girls is recorded in seconds commensurate with the length of time the subject holds the hanging position. The hanging position shows palms away from the body, the elbows flexed, and the body off the floor with the chin above the bar. The pupil holds this position as long as possible, to the nearest second.

Sit-up for boys and girls required the subject to lie on his back with legs extended and feet about two feet apart. The hands are in back of the neck with fingers interlaced and the heels are held to the floor at all times by a partner. The exercise required the subject to sit-up and touch the right elbow to the left knee and then return to the starting position. The alternating process is employed between touching the right elbow and left knee, and left elbow and right knee. One point is given for each complete movement of touching elbow to knee.

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[1] Ibid., pp. 11-23.

The shuttle run for boys and girls has the subject being timed as he races to get a block of wood thirty feet away and then return behind the starting line to deposit the block. He then returns to get the other block and his time is concluded when he crosses the original starting line with the second block. The score is recorded to the nearest tenth of a second.

The standing broad jump for boys and girls is recorded in feet and inches to the nearest inch. The distance is measured from the take-off line to the part of the body that touches the floor nearest the take-off line after landing. Preparatory to jumping, the pupil swings the arms backward and bends his knees, and then accelerates from his stationary position by extending the knees and swinging forward the arms.

The 50-yard dash for boys and girls is recorded in seconds to the nearest tenth of a second, and is the amount of time between the starter's signal and the instant the pupil crossed the finish line. Additional competition can be created by administering this test item to two pupils at a time.

The softball throw for distance for boys and girls is an overhand throw that is recorded to the nearest foot, the perpendicular distance from the starting line to where the ball lands. The pupil must throw the ball while remaining behind the restraining line and within two parallel lines, six feet apart.

The 600-yard run-walk for boys and girls is the amount of time it takes the subject to cover the distance, recorded in minutes and seconds. Running may be interspersed with walking, but the object is

to cover the distance in the shortest possible time. Any properly marked open area is permissible, but football fields and tracks lend themselves especially to this item.

The items on the AAHPER Youth Fitness Test measure dynamic strength, explosive strength, trunk strength, and stamina. Dynamic strength is strength of muscles in the limbs in moving or supporting the weight of the body repeatedly over a given period of time. It is measured by the test items dealing with pull-ups and flexed-arm hang. Explosive strength is the ability to exert maximum energy in one explosive act. It is measured on the AAHPER Youth Fitness Test by the shuttle run, softball throw, 50-yard dash, and standing broad jump. Stamina is concerned with cardio-vascular endurance and is measurable only by prolonged exertions of the whole body. The 600-yard run-walk is the fitness test item that measures this strength. Trunk strength is measured on the AAHPER Test by sit-ups, but according to some authorities, this is an imperfect assessment. Sit-ups would also be loaded to dynamic strength, explosive strength, and stamina.[1]

Academic Achievement Measurement

The Iowa Tests of Basic Skills provided for comprehensive measurement of the following fundamental areas of vocabulary, reading comprehension, language skills, work-study skills, and arithmetic skills. The purpose of these tests is to reveal how well each pupil has mastered the basic skills which are considered to be crucial to the total educational development of the pupil. The Iowa Tests of Basic Skills consist of eleven separate tests

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[1]Fleishman, The Structures of Physical Fitness, pp. 29-36.

for grades three through nine, but each pupil takes only items appropriate in content and difficulty to his own grade level. There are time restrictions on each test, but the directions for administration are the same for all grades, thus allowing any number of grades to be tested simultaneously. A test schedule for four sessions is suggested, but under no circumstances should the entire battery be administered in one day. A common procedure is to administer the test in the mornings of four consecutive days.[1]

The Vocabulary subtest is composed of items requiring the examinee to select from four choices a word having most nearly the same meaning as a designated word in a brief context. The examinee needs to recognize a synonym, and there is no measure of the breadth and depth of concepts.[2]

Reading comprehension is measured by series of multiple-choice questions on brief selections. The items are designed to determine whether the reader comprehends more than the sense meanings, so the variety of questions concerns organizational pattern, main ideas, summarizing, and tone and intent. This variety makes for a better overall measure of comprehension and the range of difficulty is sufficient to challenge individual differences at each level.[3]

The language skills test measures the skills of correct writing, spelling, capitalization, punctuation, and usage. The spelling test uses

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[1] Teacher's Manual - Iowa Tests of Basic Skills (Boston: Houghton Mifflin Co., The Riverside Press Cambridge, 1956), p. 3.

[2] J. Stanley Ahmann and Marvin D. Block, Evaluating Pupil Growth (Boston: Allyn and Bacon, Inc., 1964), p. 364.

[3] Ibid., pp. 364-365.

recognition items, and the pupil's task is to determine if any word is misspelled.[1] Capitalization, punctuation, and usage are presented in various kinds of materials, such as letters and conversation, and the pupils are directed to determine whether an error occurs or not by marking a particular choice.

Work-study skills are composed of the three subtests of map reading, reading graphs and tables, and knowledge and use of reference materials. These tests represent important aspects of reading skills in addition to development of vocabulary and comprehension of narrative material. Knowledge and use of reference materials is concerned with skills required in locating words in a dictionary, using an index and table of contents, using an encyclopedia, and locating information through the selection of correct references.[2]

Arithmetic skills are composed of two subtests that are concerned with arithmetic concepts, and arithmetic problem solving. The concepts are oriented around various areas such as simple algebra, geometic figures, monetary system, and telling time. The arithmetic problem solving required the student to set up his own operation and to use addition, subtraction, multiplication, and division for whole numbers and fractions.[3]

The group on which the battery of tests was standardized represents an attempt to include a sampling of all elementary children in grades three through eight who are in regular attendance in the public schools throughout

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[1] Ibid. [2] Ibid., p. 365. [3] Ibid., p. 366.

the United States. A total of 74,174 pupils from 213 school systems in forty-six states were included in the normative sample.[1]

The coefficient of reliability and the standard error of measurement for each of the eleven tests, and the composite of these are avilable in the Manual for Administrators, Supervisors, and Counselors.[2] The reliability coefficients range from 0.70 in Map Reading, grade three to 0.96 in Reading, grade four, for the subtests.

Grade and percentile norms are available for each of the eleven tests and for the composite of all tests. Individual pupil achievement and school averages are aided in their interpretation by percentile norm reporting. The school average norms are presented for the beginning, middle, and end of the year,[3] and this is an aid to schools that have mid-year promotions.

For additional information relating to the test batteries and descriptive data one may refer to the Sixth Mental Measurement Yearbook.[4] The copyright dates of 1955 and 1956 are reviewed, and references are supplied that concern studies associated with the Iowa Test of Basic Skills.

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[1] Ibid.

[2] E. F. Lindquist and A. N. Heironymus, Manual for Administrators, Supervisors and Counselors: Iowa Test of Basic Skills (Boston: Houghton Mifflin Company, 1956).

[3] Ahmann, Evaluating Pupil Growth, p. 366.

[4] Oscar Krisen Buros, ed., The Sixth Mental Measurement Yearbook (Highland Park, N. J.: The Gryphon Press, 1965), p. 13.

Review of Selected Research Studies

The studies reported in this section were concerned with the following criteria:

(1) The relevancy of the selections to this study in terms of providing ideas and information related to self-concept, physical fitness and academic achievement.

(2) The reporting of studies that supply pertinent information such as population data and types of tests used, with their statistical interpretation.

(3) Ventilating the multi-dimensional and expansive nature of self-conceptions by reporting studies revealing related personality facets such as popularity, personal and social adjustment, levels of aspiration, and self-esteem.

(4) Revealing the position assumed by published research in regard to the interrelationships of variables in the domains of physical fitness, self-concept, and academic achievement.

Selected studies are reported in this section which represent a consensus of the many studies reviewed by the writer. A review of the studies concerned with the interrelationship of academic achievement, physical fitness factors, and self-concept factors revealed a high degree of agreement among authorities.

The Kraus-Weber Test is a series of performances designed to measure minimum muscular fitness. Items four and five of the Kraus-Weber series have been shown to be related to school achievement in the early grades, in a study by Kagerer. Using a sample of 409 first-grade children from

Lafayette, Indiana, correlations were run on their Metropolitan Readiness Test scores and scores on the various items of the Kraus-Weber Test. The matrix of correlations indicated that school achievement was related to muscular fitness, but only to those muscle groups measured by two of the six subtests that measure relative strength and flexibility of the muscles of the lower and upper back. Kagerer's conclusion was that school achievement has a muscular component associated with it.[1]

The influence of a special physical education teacher on children's motor skill performance is reported in a study by Workman. This is a study of comparison in performance of selected motor skills between elementary school children taught by the specialist in physical education and those taught by the classroom teacher. The sample consisted of 200 sixth-grade boys and girls taught by the specialists and 200 sixth-grade boys and girls taught by the classroom teacher. The groups were compared in regard to their ability to perform five motor skill tests. Significant differences in favor of the group taught by the specialist were found on all five of the tests for girls and three of the five tests for boys. Therefore, the significant differences in the performance of the two groups could well be attributed to the difference in physical education teachers.[2]

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[1]Rudolph Lucas Kagerer, The Relationship of the Kraus-Weber Test for Minimum Muscular Fitness to School Achievement (unpublished master's thesis, Purdue University, 1958).

[2]Donna Jo Workman, "Comparison of Performance of Children Taught by the Physical Education Specialist and by the Classroom Teacher," The Research Quarterly, XXXIX No. 2, (Washington, D. C.: American Association for Health, Physical Education, and Recreation, May, 1968), 389-394.

An interrelationship between academic achievement and physical fitness achievement is suggested in a study of 827 college freshmen women. The physical fitness test consisted of the standing broad jump, flexed-arm hang, curl-ups and the three-minute step test. The girls were scored in regard to high, fair, and poor on physical fitness achievement. Grade-point averages determined for each fitness classification revealed statistically significant differences between the groups, with those achieving higher GPA's also were high on the fitness scores. These results suggest that greater health and vitality of a student aids him in achieving his academic potential.[1]

In 1965, Tillman conducted a study to determine the relationship between physical fitness factors and selected personality traits. In his study 386 high-school junior and senior boys were administered the 600-yard run-walk and pull-ups from the AAHPER Youth Fitness Test. The boys who finished in the upper 15 percent on the test were compared, by the use of personality tests, with boys who were in the lower 15 percent. The personality tests used in this study were the A-S Reaction Study of Allport, Cattell's Sixteen Personality Factor Questionnaire, and the Kuder Preference Record - Form C. The personality traits of boys who ranked in the upper 15 percent on a physical fitness test were found to differ significantly from the personality traits of the boys who ranked in the lower 15 percent

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[1]Chappelle Arnett, "Interrelationship Between Selected Physical Variables and Academic Achievement of College Women," The Research Quarterly, XXXIX No. 2, (May, 1968), 227-230.

on the test. The upper 15 percent were more extroverted, more dominant and more socially oriented than their lower 15 percent counterpart.[1]

In order to examine the relationship of physical fitness factors to selected measures of popularity a study was conducted in 1966 by Yarnall. The conditions and inferences from the study are as follows. Using a sample of seventy-five high-school boys, a sociometric measure was administered to the subjects in order to determine who were the most popular members of the class. A motor fitness index score, consisting of chins, push-ups, and vertical jump was used to determine physical fitness. A correlation coefficient was computed to determine the relationship of physical fitness to popularity. A significant r was the result, therefore the conclusion was that physical fitness is of some social value to the high-school student. The students with high popularity scores also tend to be members of more school clubs and organizations, to hold more school offices, to be athletic, and to participate in intramurals more often.[2]

Insight into the relationship of athletic achievement and personal and social adjustment of high-school boys is reported in a 1954 study by Biddulph. The personal and social adjustment of high-school boys of high athletic achievement was compared with the adjustment of boys of low athletic achievement. It was found that students ranking high in athletic

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[1] Kenneth Tillman, "Relationship Between Physical Fitness and Selected Personality Traits," The Research Quarterly, XXXVI No. 4, (December, 1965), 483-489.

[2] C. Douglas Yarnall, "Relationship of Physical Fitness to Selected Measures of Popularity," The Research Quarterly, XXXVII No. 2, (May, 1966), 286-288.

achievement demonstrated a significantly greater degree of personal and social adjustment than did students ranking low in athletic achievement.[1]

In 1954, LaPlace attempted to determine whether specific personality traits are associated with success in professional baseball. To determine this, a success group of forty-nine major-league players were compared to a "non-success" group of sixty-four minor-league players. The Minnesota Multiphasic Personality Inventory and a biographical data sheet were used to collect the data on the two variables. The results indicated minor-league players had a tendency toward sensitivity, lack of self-discipline, and their drives had a tendency to dissipate. Major-league players were also better able to adjust to situations requiring social contact, such as the ability to get along well with other people.[2]

The relationship between personality development and physical factors was reported in a study by Smith. The influence of football success and failure on the level of aspiration of the participants was determined. Smith found that individuals expressing higher levels of aspiration maintained some hope for success while repeatedly experiencing failure, and that those with low aspirations who experienced failure overtly withdrew from failure-producing situations. He also observed a tendency for those

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[1]Lowell G. Biddulph, "Athletic Achievement and the Personal and Social Adjustment of High-School Boys," The Research Quarterly, XXV No. 1, (March, 1954), 1-7.

[2]John P. LaPlace, "Personality and Its Relationships to Success in Professional Baseball," The Research Quarterly (October, 1954), pp. 313-319.

with the highest levels of aspiration to experience success repeatedly, even though they raised their level of aspiration goals.[1]

Demonstrating the relationship between physical adequacy and self-esteem, a group of nine-year-old boys was measured by a set of selected physical factors. Apparently, the nine-year-old boy who strives to attain higher goals (expresses high levels of aspiration) is physically superior in size and strength to others his age who are not willing to risk the chance of failure, and who thereby choose the aspiration level that seems to insure at least some measure of continued success.[2]

Caplin found in a study of 180 intermediate students that self-concept and achievement do compliment each other. Sixty children from the intermediate grades of each of the elementary schools in a small city in northern New Jersey were matched on the basis of age, grade, sex, race, intelligence, and socio-economic status. Correlations between scores on the self-concept instrument and the standard composite scores on the Iowa Test of Basic Skills were calculated. There was a significant positive relationship between self-concept and academic achievement. That is, those children having a more positive self-concept had higher academic achievement.[3]

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[1]C. H. Smith, "Influence of Athletic Success and Failure on the Level of Aspiration," The Research Quarterly, XX (May, 1949), 196-208.

[2]H. Harrison Clarke and David H. Clarke, "Relationship Between Level of Aspiration and Selected Physical Factors of Boys Aged Nine Years," The Research Quarterly, XXXII (March, 1961), 12-19.

[3]Morris D. Caplin, "Relationship of Self-Concept and Academic Achievement," Journal of Experimental Education, XXXVII No. 3, (Spring, 1969), 13.

Other facets of self-concept, such as popularity, level of aspiration, and social adjustment were reported in this section because they are important factors that help comprise the self-concept constellation. By reviewing studies concerned with specific dimensions of self-concept, the magnitude of the phenomenon is revealed. Self-concept is composed of many factors, each influencing the way an individual feels, thinks, and behaves toward himself. Rather than report the multi-dimensional constellation of concepts in their entirety, this study focused on the evaluative attitude which the individual held toward himself as an object. By age ten to twelve, the individual appears to have sufficient experience and ability to think abstractly, so that he can make general assessments of his powers.[1]

The studies reported in this section confirm a relationship between academic achievement, physical achievement, and self-concept factors. The consensus of the research is that success in academic achievement and physical achievement is complimented by high self-concept factors. The inverse is also supported in that as performances in academic achievement and physical achievement diminish, so do the factors associated with self-concept. The assumption from research is that the variables enjoy a positive degree of correspondence.

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[1]Coopersmith, The Antecedents of Self-Esteem, p. 8.

CHAPTER III

INTRODUCTION

The procedures of this study are presented in this chapter in the order of their occurrence. The population is defined, and the statistics are reviewed that were used to analyze the data.

The Population

The study was designed to investigate whether significant differences exist between the self-esteem scores of sixth-grade students and their performance as measured by achievement and fitness tests. With discretion, the Midwest City Public School System was chosen as the district from which the participating elementary schools were selected. The Midwest City Public Schools were chosen because of their elementary organization which included male elementary physical education instructors at the three elementary schools selected. Another criterion that influenced the selection of these elementary schools was the ability of each school to be representative of the entire Midwest City elementary system population. The three schools were agreed upon by the Midwest City Special Programs Director, and the writer as being the ones that most nearly fit the criteria of the study.

Selection of the Subjects

The three schools that participated in the study were Country Estates Elementary School, Eastside Elementary School, and Townsend Elementary School. The total sixth-grade population consisted of 306 students, ages eleven and twelve. There were 161 boys and 145 girls that comprised the 306 total. All of the sixth-grade students at each of the three elementary schools participated in the study, with the exception of those that were absent when the data were collected, or were physically handicapped to the extent they were unable to perform the various tests of physical fitness. For an itemized listing of the data collected on each student, reference may be made to Appendix A of the study.

Tools for Measuring

To determine academic achievement, physical fitness, and self-esteem, the following instruments were used to measure these variables.

(1) The Iowa Test of Basic Skills was used to measure school achievement, and these scores were reported in the form of percentiles. November of 1969 was the month when these tests were administered to the sixth-grade students used in this study. The tests were administered by the sixth-grade classroom teachers, and the answer sheets were machine scored.

(2) The AAHPER Youth Fitness Test was used to measure physical fitness of the sixth-grade students used in this study. This test was administered in February of 1970 by the male physical education instructors of the three elementary schools, and the raw scores on the various items were converted to their percentile equivalents with the use of the test manual.

(3) The Self-Esteem Inventory (S. E. I.) was determined by the twenty-five item tool devised by Coopersmith. The test was administered by the classroom teacher and hand scored by the writer. The raw scores were reported as the number correct, and this test was given in February of 1970. Reference to Appendix B gives an example of the Self-Esteem Inventory tool used in this study.

Treatment of the Data

The data for each of the subjects consisted of percentile scores being reported in school achievement and physical fitness, and a raw score being reported in self-esteem. Data analysis procedure was as follows:

Correlations for the relationship between the six section scores on the achievement test and the seven section scores on the physical fitness test were computed for every possible combination for boys, for girls, and the total group. Pearson product-moment correlation coefficients were computed to determine the various achievement-fitness relationships and this amounted to forty-two combinations for boys, forty-two combinations for girls, and forty-two combinations for total group. Table 1 shows the results of these comparisons for boys, Table 2 for girls, and Table 3 for total group.

TABLE 1

CORRELATION MATRIX FOR AAHPER YOUTH FITNESS TEST AND IOWA TEST OF BASIC SKILLS: (MALES)
N=161

df	.05	.01	Vocab-ulary	Reading Compre-hension	Lan-guage	Work-study	Arith-metic	Compos-ite
150	.159	.208						
200	.138	.181						
Pull-up			-0.0505	0.0153	0.0626	-0.0045	0.0563	0.0202
Sit-up			0.0544	0.0857	0.1315	0.0831	0.0965	0.1108
Shuttle run			0.0476	0.1449	0.2346	0.1818	0.2060	0.1882
Standing Broad Jump			-0.0374	0.0351	0.0822	0.0192	0.0785	0.0450
50-yard Dash			0.0307	0.1103	0.2011	0.1287	0.1584	0.1454
Softball Throw			-0.1179	-0.0532	0.0520	0.0086	0.1093	0.0050
600-yard run-walk			0.0286	0.1714	0.2407	0.2057	0.2403	0.2006

TABLE 2

CORRELATION MATRIX FOR AAHPER YOUTH FITNESS TEST AND IOWA TEST OF BASIC SKILLS: (FEMALES)
N=145

df	.05	.01	Vocab-ulary	Reading Compre-hension	Lan-guage	Work-study	Arith-metic	Compos-ite
125	.174	.228						
150	.159	.208						
Pull-up (flexed-arm hang)			-0.0671	-0.0024	0.0108	-0.0294	0.0571	-0.0115
Sit-up			0.0401	0.0816	0.1353	0.0337	0.1160	0.0877
Shuttle Run			-0.0734	-0.0457	0.0628	0.0571	0.0086	-0.0002
Standing Broad Jump			0.0070	0.0254	0.0699	0.1320	0.0844	0.0683
50-yard Dash			-0.0152	0.0110	0.0521	0.0004	0.0272	0.0118
Softball Throw			0.0552	0.0966	0.0478	0.1361	0.1691	0.1038
600-Yard Run-walk			0.0700	0.1658	0.1088	0.1506	0.2037	0.1570

TABLE 3

CORRELATION MATRIX FOR AAHPER YOUTH FITNESS TEST AND IOWA TEST OF BASIC SKILLS: (TOTAL GROUP) N=306

df	.05	.01	Vocab-ulary	Reading Compre-hension	Lan-guage	Work-Study	Arith-metic	Compos-ite
300	.113	.148						
400	.098	.128						
Pull-up			-0.0670	0.0085	0.0541	-0.0189	0.0447	0.0057
Sit-up			0.0494	0.0837	0.1293	0.0529	0.1050	0.1014
Shuttle run			-0.0074	0.0662	0.1624	0.1274	0.1057	0.1089
Standing Broad Jump			-0.0127	0.0302	0.0681	0.0703	0.0860	0.0548
50-Yard Dash			0.0021	0.0669	0.1430	0.0673	0.0862	0.0850
Softball Throw			-0.0537	0.0099	0.0698	0.0585	0.1196	0.0456
600-yard Run-walk			0.0379	0.1581	0.1934	0.1762	0.2096	0.1794

An attempt to determine the significance of a correlation coefficient is a frequent problem in research. One approach is to use the distribution of t, by applying the following formula:

$$t = r\sqrt{\frac{N - 2}{1 - r^2}}$$

One may determine if the sample value of r is significant, by making reference to a t table in accordance with the appropriate number of degrees of freedom.

There are tables that present tabulations of the values of r required for significance at different levels. By observation of tables that present the critical values of the correlation coefficient, it is noted where the number of degrees of freedom is small, a large value of r is required for significance. This means that little importance can be attached to correlation coefficients calculated on small samples unless these

coefficients are fairly substantial in size.[1]

In many tables, as the degrees of freedom increase past fifty, the intervals are reported irregularily. This is due to the small amount of change in the significance of the correlation coefficient, as N gets larger. For convenience, the degrees of freedom directly above and below the intervals critical to this study are reported at the .05 and .01 levels, for males, for females, and total group. Reference to these figures, and their comparison to the various correlation coefficients may be made in Tables 1, 2, and 3. An interpretation of the comparison implies if the correlation coefficient is greater than the critical value, reported in the table, then the computed coefficient is significant. The two variables that correlate may possess a common variance that influences both of them.

Taking the more conservative approach of analysis, would be to use 150 degrees freedom at the .01 confidence level for males. The actual degrees of freedom for males is N-2 or 159, but the absence of this interval in the table necessitates the use of 150df. Using .208 as the criterion, there are no correlations for females that exceed this figure. The closest figure is .2037, which is the correlation coefficient for 600-yard run-walk and arithmetic.

The correlation matrix for total group has N-2 or 304 degrees freedom. Using 300 degrees freedom at the .01 confidence level gives a slightly conservative figure of .148. Using .148 as the criterion, there are six correlations for total group that exceed this figure. The combinations

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[1]George A. Ferguson, Statistical Analysis in Psychology and Education, (New York: McGraw-Hill Book Co., 1959), p. 187.

are: shuttle run and language; 600-yard run-walk and reading comprehension; 600-yard run-walk and language; 600-yard run-walk and work-study; 600-yard run-walk and arithmetic; 600-yard run-walk and composite.

The various combinations of physical fitness factors and achievement that produce the highest correlations for males, for females, and for total group were analyzed to determine the mean differences of self-esteem as reported by the S. E. I. The combinations that yielded the highest correlations were the 600-yard run-walk and language skills for males; the 600-yard run-walk and arithmetic skills for females; the 600-yard run-walk and arithmetic skills for total group. These and other correlations may be observed by making reference to Tables 1, 2, and 3 respectively.

The groups that were chosen to fill the cells in the matrix shown in Table 4 were selected according to the following criteria.

(1) A person who merits a plus rating in the 600-yard run-walk had to score from the 60th percentile up on this test. A person who received a minus rating scored from the 40th percentile down on this fitness item.

(2) A person who received a plus rating in arithmetic skills scored from the 60th percentile up on this test, and a minus rating means he scored from the 40th percentile down.

(3) All of the people who qualified according to the stated criteria were included in the cells and by using the upper and lower forty percent of the academic achievement and physical fitness combinations, the self-esteem scores come from populations that can more accurately be termed Hi and Lo.

In Table 4, in order for a female's score to be placed in Cell A, she had to score from the 60th percentile up on the 600-yard run-walk, and from the 40th percentile down on the arithmetic skills test. To be in Cell B, a score of 60th percentile up was required on both the 600-yard run-walk, and the arithmetic skills test. To be in Cell C, a score of 40th percentile down on the 600-yard run-walk and a score of 40th percentile down on the arithmetic skills test was required. To be in Cell D, a score of 40th percentile down on the 600-yard run-walk and a score of 60th percentile up on the arithmetic skills test was required.

TABLE 4

FEMALES
Arithmetic Skills

600-yard run-walk	Lo	Hi
Hi	+600 -Arith. n=17 (A)	+600 +Arith. n=32 (B)
Lo	-600 -Arith. n=28 (C)	-600 +Arith. n=20 (D)

Cell A data refer to Appendix D. Table 10.
Cell B data refer to Appendix D, Table 11.
Cell C data refer to Appendix D, Table 12.
Cell D data refer to Appendix D, Table 13.

In Table 5, in order for a male's score to be placed in Cell A, he had to score from the 60th percentile up on the 600-yard run-walk, and from the 40th percentile down on the language skills test. Cell B has scores of 60th percentile up on both 600-yard run-walk and language skills. Cell C has scores of 40th percentile down on both the 600-yard run-walk, and language skills tests. Cell D has scores on 40th percentile down on the 600-yard run-walk and 60th percentile up on the language skills test.

TABLE 5

MALES
Language Skills

		Lo		Hi
		+600 -Lang. Skills		+600 +Lang. Skills
600-yard run-walk	Hi	n=8	A B	n=36
		-600 -Lang. Skills	C D	-600 +Lang. Skills
	Lo	n=31		n=36

Cell A data refer to Appendix D, Table 14.
Cell B data refer to Appendix D, Table 15.
Cell C data refer to Appendix D, Table 16.
Cell D data refer to Appendix D, Table 17.

Table 6 deals with total group, and Cell A is filled with scores of 60th percentile up on the 600-yard run-walk and 40th percentile down on arithmetic skills. Cell B has scores of 60th percentils up on both 600-yard run-walk and arithmetic skills. Cell C has scores of 40th percentile down on both 600-yard run-walk and arithmetic skills. Cell D has

scores of 40th percentile down on 600-yard run-walk and 60th percentile up on arithmetic skills.

TABLE 6

TOTAL GROUP
Arithmetic Skills

		Lo		Hi
		+600 -Arith.		+600 +Arith.
600-yard run-walk	Hi	n=25	A B	n=36
			C D	
		-600 -Arith.		-600 +Arith.
	Lo	n=49		n=48

Cell A, refer to Appendix D, Table 18.
Cell B, refer to Appendix D, Table 19.
Cell C, refer to Appendix D, Table 20.
Cell D, refer to Appendix D, Table 21.

In order to determine whether there are significant differences in the means of the self-esteem scores, "t" tests were computed between the various cell combination for males, for females, and total group. For each of the three groups, mean differences were computed between cells A and B, A and D, A and C, B and D, B and C, and D and C.

In order to determine the significance of the difference between variances for the independent samples, it was necessary to subject the samples to F tests. Ferguson purports that the F test assumes equality of variances in the populations from which the samples are drawn, and this condition is usually spoken of as homogeneity of variance. The departure of

the ratio of the two variances from unity is indicative of a difference between variances, and if the difference is significant, it is referred to as heterogeneous variance. The F ratio is calculated and reference to a table determines a significant level. In comparing the variances for two independent groups, the values are considered at the ten and the two percent levels.[1]

If the variances are significantly different (heterogeneous) a somewhat larger value of "t" may result than would otherwise be obtained. Instead of pooling the sums of squares from the samples and the corresponding degrees of freedom, one computes the variance of each mean separately.[2]

Results of the F tests may be found in Appendix C, Tables 7, 8, and 9 for males, females, and total group respectively. A review of the F test results in Appendix C revealed homogeneity of variance could not be assumed.

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[1]Ferguson, Statistical Analysis, pp. 181-183.

[2]Allen L. Edwards, Experimental Design in Psychological Research Education (New York: Rinehard & Company, Inc., 1950), pp. 164-170.

CHAPTER IV

ANALYSIS OF DATA, SUMMARY, CONCLUSION, AND RECOMMENDATIONS

The general hypothesis of this study assumed there were no significant differences in the mean score of self-esteem of the various sub-group combinations for males, females, and total group.

(1) There are six specific hypotheses that apply to the sub-group combinations dealing with the 600-yard run-walk and language skills matrix for males.

(2) There are six specific hypotheses that apply to the sub-group combinations dealing with the 600-yard run-walk and arithmetic skills matrix for females.

(3) There are six specific hypotheses that apply to the sub-group combinations dealing with the 600-yard run-walk and arithmetic skills matrix for total group.

The eighteen specific hypotheses and their findings were accepted or rejected according to the .05 level of significance.

Males

(1) There was no statistically significant difference between the mean score of self-esteem for male students with high 600-yard run-walk

and low language skills and the mean score of self-esteem for male students with high 600-yard run-walk and high language skills. The obtained "t" value was .03435 and this is less than the required value for significance.

(2) There was no statistically significant difference between the mean score of self-esteem for male students with high 600-yard run-walk and low language skills and the mean score of self-esteem for male students with low 600-yard run-walk and high language skills. The obtained "t" value was -0.2783 and this is less than the required value for significance.

(3) There was no statistically significant difference between the mean score of self-esteem for male students with high 600-yard run-walk and low language skills and the mean score of self-esteem for male students with low 600-yard run-walk and low language skills. The obtained "t" value was .3882 and this is less than the required value for significance.

(4) There was no statistically significant difference between the mean score of self-esteem for male students with high 600-yard run-walk and high language skills and the mean score of self-esteem for male students with low 600-yard run-walk and high language skills. The obtained "t" value was .1219 and this is less than the required value for significance.

(5) There was no statistically significant difference between the mean score of self-esteem for male students with high 600-yard run-walk and high language skills and the mean score of self-esteem for male students with low 600-yard run-walk and low language skills. The obtained "t" value was 4.3658 and this is greater than the required value for significance. The hypothesis was rejected and reference to this hypothesis is made in subsequent sections of this chapter.

(6) There was no statistically significant difference between the mean score of self-esteem for male students with low 600-yard run-walk and high language skills and the mean score of self-esteem for male students with low 600-yard run-walk and low language skills. The obtained "t" value was 1.0471 and this is less than the required value for significance.

Females

(7) There was no statistically significant difference between the mean score of self-esteem for female students with high 600-yard run-walk and low arithmetic skills and the mean score of self-esteem for female students with high 600-yard run-walk and high arithmetic skills. The obtained "t" value was -.4521 and this is less than the required value for significance.

(8) There was no statistically significant difference between the mean score of self-esteem for female students with high 600-yard run-walk and low arithmetic skills and the mean score of self-esteem for female students with low 600-yard run-walk and high arithmetic skills. The obtained "t" value was -.4756 and this is less than the required value for significance.

(9) There was no statistically significant difference between the mean score of self-esteem for female students with high 600-yard run-walk and low arithmetic skills and the mean score of self-esteem for female students with low 600-yard run-walk and low arithmetic skills. The obtained "t" value was 0.1083 and this is less than the required value for significance.

(10) There was no statistically significant difference between the mean score of self-esteem for female students with high 600-yard run-walk and high arithmetic skills and the mean score of self-esteem for female students with low 600-yard run-walk and high arithmetic skills. The obtained "t" value was -0.0685 and this is less than the required value for significance.

(11) There was no statistically significant difference between the mean score of self-esteem for female students with high 600-yard run-walk and high arithmetic skills and the mean score of self-esteem for female students with low 600-yard run-walk and low arithmetic skills. The obtained "t" value was .6642 and this is less than the required value for significance.

(12) There was no statistically significant difference between the mean score of self-esteem for female students with low 600-yard run-walk and high arithmetic skills and the mean score of self-esteem for female students with low 600-yard run-walk and low arithmetic skills. The obtained "t" value was .6696 and this is less than the required value for significance.

Total Group

(13) There was no statistically significant difference between the mean score of self-esteem for male and female students with high 600-yard run-walk and low arithmetic skills and the mean score of self-esteem for male and female students with high 600-yard run-walk and high arithmetic skills. The obtained "t" value was -0.6718 and this is less than the required value for significance.

(14) There was no statistically significant difference between the mean score of self-esteem for male and female students with high 600-yard run-walk and low arithmetic skills and the mean score of self-esteem for male and female students with low 600-yard run-walk and high arithmetic skills. The obtained "t" value was -0.6426 and this is less than the required value for significance.

(15) There was no statistically significant difference between the mean score of self-esteem for male and female students with high 600-yard run-walk and low arithmetic skills and the mean score of self-esteem for male and female students with low 600-yard run-walk and low arithmetic skills. The obtained "t" value was 0.2068 and this is less than the required value for significance.

(16) There was no statistically significant difference between the mean score of self-esteem for male and female students with high 600-yard run-walk and high arithmetic skills and the mean score of self-esteem for male and female students with low 600-yard run-walk and high arithmetic skills. The obtained "t" value was 0.0048 and this is less than the required value for significance.

(17) There was no statistically significant difference between the mean score of self-esteem for male and female students with high 600-yard run-walk and high arithmetic skills and the mean score of self-esteem for male and female students with low 600-yard run-walk and low arithmetic skills. The obtained "t" value was 1.1176 and this is less than the required value for significance.

(18) There was no statistically significant difference between the mean score of self-esteem for male and female students with low 600-yard run-walk and high arithmetic skills and the mean score of self-esteem for male and female students with low 600-yard run-walk and low arithmetic skills. The obtained "t" value was 1.0505 and this is less than the required value for significance.

Observations

The correlation coefficients of this study, as presented in Table 1, Table 2, and Table 3 were not impressive from a "prediction" standpoint. For purposes of prediction, the higher the coefficient, the greater the accuracy of prediction. A correlation of .7071 is required before one can state that fifty percent of the variance of the one variable is predictable from the variance of the other.[1]

The correlations do reveal a tendency for certain physical fitness sub-tests to load heavier with certain academic achievement tests. Considering this loading tendency from the view point of correlations that were significant, as reviewed in Chapter III of this study, it is interesting to note that of all the physical fitness sub-tests, shuttle run was involved two times, and 600-yard run-walk was involved seven times.

In general, the shuttle run measures explosive strength and agility while the 600-yard run-walk measures stamina (cardio-vascular endurance).[2]

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[1]Ferguson, Statistical Analysis, p. 128.

[2]Fleishman, The Structure of Physical Fitness, pp. 155-158.

Both tests are "timed" items and improvement in performance is definitely related to desire, effort, and tenacity.

The sub-tests in academic achievement that loaded heavier with the physical fitness tests were as follows: language loaded two times; arithmetic loaded two times; reading comprehension, work-study and composite each loaded one time. From this analysis, arithmetic and language are the academic achievement sub-tests that load more heavily with the physical fitness tests.

Resulting from an evaluation of the correlation findings, this study has shown the 600-yard run-walk to be related to school achievement in the sixth grade, more than any of the other fitness items. The endurance and tenacity necessary to score well on the 600-yard run-walk may be traits that are also peculiar to success in the academic domain. The variables that are common to the 600-yard run-walk and the academic achievement areas may provide a basis for subsequent research studies. One might attempt to determine if the correlation between the two variables is a functional relationship or a casual relationship.

Of the eighteen hypotheses that were tested concerning differences in the means of self-esteem, only the high achievement-high physical fitness group versus the low achievement-low physical fitness group for males was significant. The high achievement-high physical fitness group versus the low achievement-low physical fitness group was compared for females and total group, but only the male groups were significant. Of the eighteen hypotheses that were tested only three had the unique combination of comparing high achievement-high physical fitness with low achievement-low

physical fitness in regard to self-esteem scores. The other sub-group self-esteem scores for males, females, and total group were from people who had not performed all high or low on the achievement-fitness tests, but had a mixed performance. Fifteen of the hypotheses were concerned with comparisons of self-esteem scores between groups, where in each instance when there was a comparison of one groups' mean score to another groups' mean score, at least one of the groups' performance was either high achievement-low physical fitness, or low achievement-high physical fitness. The arrangement was prevalent in fifteen of the eighteen hypotheses and consequently limited the comparisons of "all highs" to "all lows" to three times.

By considering the "gestalt" of the study, it appears the findings are contrary to published research. Self-esteem scores were not significantly influenced by high or low performances in achievement and physical fitness in the majority of comparisons. According to Wilkinson, the probability of obtaining significant statistics by chance at the .05 level of significance is .6028.[1] This implies if eighteen hypotheses are tested at the .05 confidence level, there is approximately a sixty percent opportunity one of the hypotheses will be significant simply by chance.

Other considerations were the possession of desirable qualities of the self-esteem inventory tool. One consideration was the validity of the test, and whether it measured what it claimed to measure. Hopefully the

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[1]Bryan Wilkinson, "A Statistical Consideration in Psychological Research," Psychological Bulletin, ed. by Lyle H. Lanier and Margaret K. Harlow, XLVIII (Washington, D. C.: The American Psychological Association Inc., 1951), pp. 156-158.

test was specifically related to the trait for which it was designed to measure, and the students answered "honestly" according to his self-appraisal.

The reliability of a tool suggested that the test measures accurately and consistently, from one time to another. Reliable tests, whatever they measure, yield comparable scores upon repeated administration.[1]

The degree of reliability may be established by correlating the results when the same individuals take duplicate or equivalent forms of the test. The degree of reliability may also be established by correlating the scores on two or more successive administrations of the same test, putting the scores on the first administration of the test against scores made by the same students on a repeat performance. Another test of reliability consists of correlating the scores on the odd items of the tests (number one, three, five, seven, ets.) against the even items (numbers two, four, six, eight, etc).[2]

Subsequent research that uses the S. E. I. might consider checking the degree of reliability by one of the previous mentioned methods, in order to see if their findings are in agreement with the test-retest reliability figures of .70 and .88 reported by Coopersmith and reviewed in Chapter II of this study. An unreliable test would be comparable to an elastic ruler that reports different measurements each time it is used, and as a consequence consistency is violated.

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[1]John W. Best, Research in Education (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1959), pp. 177-178.

[2]Ibid., p. 243.

Analysis

In analyzing the findings of this study, the writer feels the results accurately portray the population that was measured. Self-esteem is a multi-dimensional phenomenon and dependent upon and influenced by many other variables than achievement in the academic and physical domains. It may even be inaccurate to assume that because a performance is "high," self-esteem is enhanced as self-esteem may be antecedent to high performances and not necessarily as a "result of." Possibly a more accurate assumption is to consider a reciprocal relationship between "performance" and self-esteem.

In response to the "bias" reported in the literature showing high self-esteem to be complimented by high performances in academic achievement and physical achievement, the writer suggests these findings to be "incomplete." Frequently the relationships that are identified are in domains "easier" to measure, and not necessarily the ones that are most influential. For an example think of the influence of "desire" on a performance in the academic and physical domains, but desire seems to be more easily observed in retrospect than measured.

Before cause and effect relationships are purported between self-esteem and performances in the academic and physical domains, the writer suggests more probing be done to determine if other variables are present that are equally influential. Some of these "other variables" may be in the affective domain and consequently are not easy to distinguish and certainly not easily measured.

In conclusion the writer hypothesizes that research has over emphasized the relationship between physical achievement and self-esteem and

academic achievement and self-esteem primarily because physical fitness and academic achievement are "measurable variables." The writer purports the existence of other significant variables that relate to self-esteem, which are just as influential, but are ignored because of their difficulty of measurement due to their presence in the affective domain.

Summary

According to this study, there were no highly impressive correlates from a "predictive" standpoint that resulted from running correlations on the six sub-tests of the Iowa Test of Basic Skills and the seven sub-tests of the AAHPER Youth Fitness Test. There was a tendency for the 600-yard run-walk fitness test to load heavier with the various tests of academic achievement. The arithmetic skills tests and the language skills test were the academic achievement sub-tests that revealed a slight tendency to load more heavily with the fitness tests. In the majority of cases, self-esteem did not appear to be influenced significantly by high and low performances on the academic achievement and physical fitness tests. The conjecture on the writer's part was that published literature has too freely associated a relationship between high self-esteem and achievement in the academic and physical domains, and has ignored other influential variables because of their difficulty to measure and identify. These "other variables" being present in the affective domain merit the concerted effort of every educator in an attempt to explore their identity and their measurable characteristics.

Conclusions

From an analysis of the data, the following conclusions were made:

(1) The physical fitness test of 600-yard run-walk consistently loaded heavier with the various tests of academic achievement.

(2) Language skills and arithmetic skills were the two sub-tests of the Iowa Test of Basic Skills that consistently loaded heavier with the various fitness tests.

(3) Physical achievement does not exert more influence than academic achievement on the self-esteem scores of eleven and twelve-year-old children.

Recommendations

From the results of this investigation, suggestions are afforded subsequent studies to be concerned with:

(1) To explore in depth the factors measured by the 600-yard run-walk, and their relationship to academic achievement.

(2) Determine whether self-esteem is antecedent to physical and cognitive success, or if it is a reciprocal relationship.

(3) Conduct a study with other age groups, to determine if the patterns of self-esteem vary with age.

(4) A longitudinal study of the same group to observe how self-esteem scores fluctuate as success and failures are experienced in school.

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APPENDIX A

_____ _____ I. D._____
Name School

Sex_____

Age (months)_____

Height (inches)_____

Weight (lbs.)_____

Self-Esteem Inventory_____

Pull-ups (Boys)_____

Modified Pull-ups (Girls)_____

Sit-ups_____

Shuttle Run_____

Standing Broad Jump_____

50-Yard Dash_____

Softball Throw_____

600-Yard Run-Walk_____

Vocabulary_____

Reading_____

Language Skills (Total)_____

Work-Study Skills (Total)_____

Arithmetic Skills (Total)_____

Composite_____

APPENDIX B

NAME: _____ SCHOOL: _____

TEACHER: _____ DATE: _____

Please mark each statement in the following way:

If the statement describes how you usually feel, put an (x) in the column "LIKE ME."

If the statement does not describe how you usually feel, put an (x) in the column "UNLIKE ME."

There are no right or wrong answers.

	LIKE ME	UNLIKE ME
Example: I am a hard worker		
1. I often wish I were someone else		
2. I find it very hard to talk in front of the class. .		
3. There are lots of things about myself I would change if I could		
4. I can make up my mind without too much trouble . . .		
5. I am lots of fun to be with		
6. I get upset easily at home		
7. It takes me a long time to get used to anything new.		
8. I'm popular with kids my own age		
9. My parents usually consider my feelings		
10. I give in very easily		
11. My parents expect too much of me		
12. It's pretty tough to be me		
13. Things are all mixed up in my life		

14.	Kids usually follow my ideas	
15.	I have a low opinion of myself	
16.	There are many times when I would like to leave home .	
17.	I often feel upset in school	
18.	I'm not as nice looking as most people	
19.	If I have something to say, I usually say it	
20.	My parents understand me	
21.	Most people are better liked than I am	
22.	I usually feel as if my parents are pushing me	
23.	I often get discouraged in school.	
24.	Things usually don't bother me	
25.	I can't be depended on	

APPENDIX C

TABLE 7

APPLICATION OF F TESTS FOR HOMOGENEITY OF VARIANCE FOR MALES

Formula

$$F = \frac{\text{Larger Variance}}{\text{Smaller Variance}}$$

Language Skills

600-yard run-walk

A	B
C	D

$$A \& B = \frac{(B)\ 20.8064}{(A)\ 12.9838} = 1.6024$$

$$A \& D = \frac{(D)\ 17.0643}{(A)\ 12.9838} = 1.3142$$

$$A \& C = \frac{(A)\ 12.9838}{(C)\ 10.6172} = 1.2229$$

$$B \& D = \frac{(B)\ 20.8064}{(D)\ 17.0643} = 1.2192$$

$$B \& C = \frac{(B)\ 20.8064}{(C)\ 10.6172} = *1.9596$$

$$D \& C = \frac{(D)\ 17.0643}{(C)\ 10.6172} = 1.6072$$

*Denotes significance at the .10 level.

APPENDIX C

TABLE 8

APPLICATION OF F TESTS FOR HOMOGENEITY OF VARIANCE FOR FEMALES

Formula

$$F = \frac{\text{Larger Variance}}{\text{Smaller Variance}}$$

Arithmetic Skills

600-yard run-walk

A	B
C	D

$$A \& B = \frac{(A)\ 21.2383}{(B)\ 20.8438} = 1.0189$$

$$A \& D = \frac{(A)\ 21.2383}{(D)\ 12.2094} = 1.7395$$

$$A \& C = \frac{(A)\ 21.2383}{(C)\ 13.4183} = 1.5827$$

$$B \& D = \frac{(B)\ 20.8438}{(D)\ 12.2094} = 1.7071$$

$$B \& C = \frac{(B)\ 20.8438}{(C)\ 13.4183} = 1.5533$$

$$D \& C = \frac{(C)\ 13.4183}{(D)\ 12.2094} = 1.0990$$

APPENDIX C

TABLE 9

APPLICATION OF F TESTS FOR HOMOGENEITY OF VARIANCE FOR TOTAL GROUP

Formula

$$F = \frac{\text{Larger Variance}}{\text{Smaller Variance}}$$

Arithmetic Skills

600-yard run-walk

A	B
C	D

$$A \& B = \frac{(B)\ 20.3734}{(A)\ 16.8863} = 1.2065$$

$$A \& D = \frac{(D)\ 17.4281}{(A)\ 16.8863} = 1.0320$$

$$A \& C = \frac{(A)\ 16.8863}{(C)\ 13.1435} = 1.2847$$

$$B \& D = \frac{(B)\ 20.3734}{(D)\ 17.4281} = 1.1689$$

$$B \& C = \frac{(B)\ 20.3734}{(C)\ 13.1435} = 1.5500$$

$$D \& C = \frac{(D)\ 17.4281}{(C)\ 13.1435} = 1.3259$$

APPENDIX D

TABLE 10

+600-yard run-walk, -Arithmetic (Girls) A

	I.D.	S.E.I.	N = 17
1.	126	17	
2.	133	15	
3.	134	12	
4.	137	15	
5.	139	10	ΣX = 234.0000
6.	152	14	ΣX^2 = 3,582.0000
7.	151	11	N = 17.0000
8.	159	20	$\bar{X}$ = 13.7647
9.	183	20	s.d. = 4.6085
10.	307	22	
11.	234	6	
12.	235	6	
13.	34	18	
14.	67	9	
15.	6	16	
16.	8	11	
17.	13	12	

APPENDIX D

TABLE 11

+600-yard run-walk, +Arithmetic (Girls) B

	I.D.	S.E.I.		I.D.	S.E.I.
1.	105	16	21.	203	17
2.	113	11	22.	204	9
3.	112	17	23.	197	18
4.	111	19	24.	216	6
5.	115	5	25.	218	12
6.	117	21	26.	258	18
7.	118	22	27.	259	22
8.	121	16	28.	268	19
9.	122	20	29.	274	23
10.	124	19	30.	19	17
11.	127	10	31.	20	15
12.	158	18	32.	30	14
13.	164	20			
14.	165	12			
15.	166	16			
16.	169	19			
17.	174	10			
18.	179	12			
19.	182	19			
20.	192	19			

ΣX = 511.0000

ΣX^2 = 8,827.0000

N = 32.0000

$\bar{X}$ = 15.9687

s.d. = 4.5655

APPENDIX D

TABLE 12

-600-yard run-walk, -Arithmetic (Girls) C

	I.D.	S.E.I.		I.D.	S.E.I.
1.	138	13	21.	94	19
2.	150	14	22.	90	14
3.	160	10	23.	88	16
4.	302	12	24.	3	16
5.	238	12	25.	12	20
6.	250	15	26.	14	11
7.	246	6	27.	18	14
8.	251	8	28.	22	10
9.	34	17			
10.	40	11			
11.	41	19	ΣX =	372.0000	
12.	56	15	ΣX^2 =	5,318.0000	
13.	272	16	N =	28.0000	
14.	291	12	$\bar{X}$ =	13.2857	
15.	292	14	s.d. =	3.6631	
16.	298	18			
17.	59	5			
18.	79	12			
19.	76	13			
20.	81	10			

APPENDIX D

TABLE 13

-600-yard run-walk, +Arithmetic (Girls) D

	I.D.	S.E.I.
1.	188	22
2.	212	10
3.	236	14
4.	237	12
5.	248	17
6.	247	18
7.	254	16
8.	253	21
9.	252	22
10.	261	16
11.	263	20
12.	267	13
13.	275	16
14.	299	21
15.	56	14
16.	61	15
17.	66	12
18.	78	19
19.	27	14
20.	26	14

$\Sigma X = 326.0000$

$\Sigma X^2 = 5,558.0000$

$N = 20.0000$

$\bar{X} = 16.3000$

$s.d. = 3.4942$

APPENDIX D

TABLE 14

+600-yard run-walk, -Language Skills (Boys) A

	I.D.	S.E.I.		
1.	7	13		
2.	17	10	ΣX =	109.0000
3.	106	21	ΣX^2=	1,589.0000
4.	285	17	N =	8.0000
5.	135	10	$\bar{X}$ =	13.6250
6.	129	12	s.d. =	3.6033
7.	140	11		
8.	167	15		

APPENDIX D

TABLE 15

+600-yard run-walk, +Language Skills (Boys) B

	I.D.	S.E.I.		I.D.	S.E.I.
1.	65	18	21.	97	23
2.	269	16	22.	16	16
3.	4	20	23.	25	12
4.	68	4	24.	35	18
5.	300	14	25.	45	15
6.	195	21	26.	257	13
7.	189	8	27.	260	15
8.	185	16	28.	264	21
9.	172	22	29.	270	11
10.	119	15	30.	273	9
11.	114	21	31.	108	23
12.	181	15	32.	120	17
13.	186	12	33.	125	20
14.	196	12	34.	157	8
15.	284	17	35.	170	22
16.	306	13	36.	173	21
17.	209	14	ΣX =	570.0000	
18.	242	13	ΣX^2 =	9,774.0000	
19.	107	17	N =	36.0000	
20.	69	18	$\bar{X}$ =	15.8333	
			s.d. =	4.5614	

APPENDIX D

TABLE 16

-600-yard run-walk, -Language Skills (Boys) C

	I.D.	S.E.I.		I.D.	S.E.I.
1.	52	10	21.	144	7
2.	49	7	22.	148	13
3.	95	10	23.	161	20
4.	103	12	24.	200	12
5.	241	12	25.	277	8
6.	223	17	26.	278	6
7.	213	12	27.	279	9
8.	287	17	28.	286	14
9.	276	15	29.	294	11
10.	175	9	30.	295	15
11.	297	11	31.	296	11
12.	301	12			
13.	210	13	ΣX =	361.0000	
14.	221	15	ΣX^2 =	4,533.0000	
15.	48	7	N =	31.0000	
16.	50	11	$\bar{X}$ =	11.6451	
17.	60	12	s.d. =	3.2584	
18.	75	12			
19.	74	14			
20.	142	7			

APPENDIX D

TABLE 17

-600-yard run-walk, +Language Skills (Boys) D

	I.D.	S.E.I.		I.D.	S.E.I.
1.	57	14	21.	193	9
2.	266	14	22.	194	21
3.	23	19	23.	201	16
4.	21	21	24.	202	9
5.	82	16	25.	282	11
6.	85	19	26.	230	15
7.	71	15	27.	70	12
8.	244	14	28.	84	15
9.	245	20	29.	28	15
10.	243	12	30.	32	7
11.	229	20	31.	38	21
12.	228	15	32.	262	15
13.	222	6	33.	265	18
14.	305	14	34.	271	23
15.	128	17	35.	53	15
16.	109	20	36.	63	8
17.	116	19	ΣX	=	553.0000
18.	123	17	ΣX^2	=	9,109.0000
19.	163	15	N	=	36.0000
20.	191	16	$\bar{X}$	=	15.3611
			s.d.	=	4.1309

APPENDIX D

TABLE 18

+600-yard run-walk, -Arithmetic (Both) A

	I.D.	S.E.I.		I.D.	S.E.I.
1.	126	17	21.	17	10
2.	133	15	22.	285	17
3.	134	12	23.	135	10
4.	137	15	24.	129	12
5.	139	10	25.	140	11
6.	152	14			
7.	151	11			
8.	159	20			
9.	183	20			
10.	307	22			
11.	234	6	ΣX	=	339.0000
12.	235	6	ΣX^2	=	5,019.0000
13.	34	18	N	=	25.0000
14.	67	9	$\bar{X}$	=	13.5600
15.	6	16	s.d.	=	4.1093
16.	8	11			
17.	13	12			
18.	36	15			
19.	154	17			
20.	7	13			

APPENDIX D

TABLE 19

+600-yard run-walk, +Arithmetic (Both) B

	I.D.	S.E.I.		I.D.	S.E.I.
1.	105	16	21.	203	17
2.	113	11	22.	204	9
3.	112	17	23.	197	18
4.	111	19	24.	216	6
5.	115	5	25.	218	12
6.	117	21	26.	258	18
7.	118	22	27.	259	22
8.	121	16	28.	268	19
9.	122	20	29.	274	23
10.	124	19	30.	19	17
11.	127	10	31.	20	15
12.	158	18	32.	30	14
13.	164	20	33.	15	17
14.	165	12	34.	255	14
15.	166	16	35.	62	12
16.	169	19	36.	73	22
17.	174	10	37.	106	21
18.	179	12	38.	65	18
19.	182	19	39.	269	16
20.	192	19	40.	4	20

TABLE 19 Continued

	I.D.	S.E.I.		I.D.	S.E.I.
41.	68	4	54.	97	23
42.	300	14	55.	16	16
43.	195	21	56.	35	18
44.	189	8	57.	45	15
45.	185	16	58.	257	13
46.	119	15	59.	260	15
47.	114	21	60.	264	21
48.	181	15	61.	270	11
49.	186	12	62.	273	9
50.	196	12	63.	108	23
51.	284	17	64.	120	17
52.	306	13	65.	125	20
53.	107	17	66.	170	22
			67.	173	21

$\Sigma X = 1,080.0000$

$\Sigma X^2 = 18,774.0000$

$N = 67.0000$

$\bar{X} = 16.1194$

$s.d. = 4.5137$

APPENDIX D

TABLE 20

-600-yard run-walk, -Arithmetic (Both) C

	I.D.	S.E.I.		I.D.	S.E.I.
1.	138	13	21.	94	19
2.	150	14	22.	90	14
3.	160	10	23.	88	16
4.	302	12	24.	3	16
5.	238	12	25.	12	20
6.	250	15	26.	14	11
7.	246	6	27.	18	14
8.	251	8	28.	22	10
9.	37	17	29.	225	22
10.	40	11	30.	163	15
11.	41	19	31.	82	16
12.	46	15	32.	57	14
13.	272	16	33.	103	12
14.	291	12	34.	213	12
15.	292	14	35.	276	15
16.	298	18	36.	301	12
17.	59	5	37.	210	13
18.	79	12	38.	50	11
19.	76	13	39.	75	12
20.	81	10	40.	142	7

TABLE 20 Continued

	I.D.	S.E.I.			
41.	144	7			
42.	148	13	ΣX	=	630.0000
43.	200	12	ΣX^2	=	8,744.0000
44.	277	8	N	=	49.0000
45.	278	6	$\bar{X}$	=	12.8571
46.	286	14	s.d.	=	3.6254
47.	294	11			
48.	295	15			
49.	296	11			

APPENDIX D

TABLE 21

-600-yard walk-run, +Arithmetic (Both) D

	I.D.	S.E.I.		I.D.	S.E.I.
1.	188	22	21.	232	20
2.	212	10	22.	29	7
3.	236	14	23.	130	17
4.	237	12	24.	52	10
5.	248	17	25.	266	14
6.	247	18	26.	23	19
7.	254	16	27.	21	21
8.	253	21	28.	85	19
9.	252	22	29.	245	20
10.	261	16	30.	229	20
11.	263	20	31.	228	15
12.	267	13	32.	128	17
13.	275	16	33.	109	20
14.	299	21	34.	116	19
15.	56	14	35.	123	17
16.	61	15	36.	191	16
17.	66	12	37.	193	9
18.	78	19	38.	194	21
19.	27	14	39.	202	9
20.	26	14	40.	230	15

TABLE 21 Continued

	I.D.	S.E.I.			
41.	28	15			
42.	32	7	ΣX	=	773.0000
43.	38	21	ΣX^2	=	13,285.0000
44.	262	15	N	=	48.0000
45.	265	18	$\bar{X}$	=	16.1041
46.	271	23	s.d.	=	4.1747
47.	53	15			
48.	63	8			

APPENDIX E

FORMULAS USED IN COMPUTING TESTS OF SIGNIFICANCE

1. "t" test used when variances are homogeneous and number of cases in the two samples are equal:

$$t = \frac{M_1 - M_2}{\sqrt{\frac{\Sigma X_1^2 + \Sigma X_2^2}{N_1 \ (N_1 - 1)}}}$$

where:

M_1 and M_2 = means of the two samples

ΣX_1^2 and ΣX_2^2 = sums of squares of the two samples

N_1 = size of each sample

2. "t" test used when variances are homogeneous and number of cases in the two samples are unequal:

$$t = \frac{M_1 - M_2}{\left(\frac{\Sigma X_1^2 + \Sigma X_2^2}{N_1 + N_2 - 2}\right)\left(\frac{N_1 + N_2}{N_1 N_2}\right)}$$

where:

M_1 and M_2 = means of the two samples

ΣX_1^2 and ΣX_2^2 = sums of squares of the two samples

N_1 and N_2 = numbers of cases in the two samples

APPENDIX E Continued

3. "t" test used when variances are heterogeneous:

$$t = \frac{M_1 - M_2}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Where:

M_1 and M_2 = means of the two samples

S_1^2 and S_2^2 = variance of the two samples

N_1 and N_2 = number of cases in the two samples