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A FIELD STUDY OF THE RELATIONSHIP
BETWEEN RUNNING AND SELF CONCEPT DEVELOPMENT
AMONG ELEMENTARY SCHOOL STUDENTS

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A FIELD STUDY OF THE RELATIONSHIP BETWEEN RUNNING AND SELF CONCEPT DEVELOPMENT AMONG ELEMENTARY SCHOOL STUDENTS

By

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ABSTRACT

A FIELD STUDY OF THE RELATIONSHIP BETWEEN RUNNING AND SELF CONCEPT DEVELOPMENT AMONG ELEMENTARY SCHOOL STUDENTS

By

Jeffrey S. Sonnega

This experiment examined the relationship between running and self concept development among elementary school students. For 10 weeks, subjects engaged in an after school running program 3 afternoons per week. The purpose of the study was to investigate whether participation in aerobic activity (running) would lead to increases in self concept and physical fitness. Experimental subjects volunteered to participate in the Running Club and underwent pre and post testing with the Self Description Questionnaire I (SDQI) and the Progressive Aerobic Cardiovascular Endurance Run (PACER). A comparison (control) group was developed and participated in the regular

physical education curriculum but did not run after school. They completed the same psychological and physical fitness measures as experimental subjects under a pretest posttest quasi-experimental design.

Experimental subjects did not significantly improve their aerobic capacity as a result of the intervention. Both experimental and control subjects increased in their self concept of physical appearance, but no significant increases were noted in the self concept of physical ability, peer self concept and total self concept. Racial and gender differences were observed on the PACER while special education students scored lower than regular education students on most dependent measures. Interaction effects were noted between the self concept of physical ability with gender and race. There was a trend among control subjects that a lack of participation in an exercise program lead to increases in the self concept of physical appearance and peer relations. A significant number of students dropped out of the experimental group and were analyzed separately. Implication of the findings and suggestions for further research are discussed.

DEDICATION

The following treatise is dedicated to my family whom without their support this accomplishment would never have been completed.

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The author wishes to express my heartfelt thanks to the faculty and staff at Michigan State University for their support, encouragement, and guidance over the course of my graduate career. In particular, I express my gratitude to Dr. Don Hamachek, who was my dissertation advisor, a supportive educator, and most importantly, a consistent role model. Many people have assisted me along the way including the other members of my committee: Drs. Hapkiewicz, Bianchi, and Baumgardner.

I also wish to acknowledge the Lansing Public School System and the students and staff at Bingham Elementary School who participated in the study. Laska Lewis, faculty advisor for the Running Club, was instrumental in this endeavor. I am grateful to Dr. Herbert Marsh for his authorization to use the Self Description Questionnaire I and its accompanying scoring materials. Several others have assisted along the way but they are too many to mention here individually at the risk of omitting someone. However, I thank all of you and appreciate your support.

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CHAPTER I

INTRODUCTION

Statement of the Problem

There is a lack of scientific research regarding the relationship between aerobic activity and self concept development in children. Despite a documented link between exercise and mental well-being among adults, interventions with children have lead to equivocal results. Earlier research posited that self esteem is a global component, but more recent research has shown this psychological construct to be hierarchical and multifaceted. By examining more specific aspects of the self concept, interventions are thought to have more of an impact. The physical fitness of today's youth is declining and low self esteem has been implicated as a factor in many of our social ills and delinquent behaviors. Many programs have been designed to increase self esteem in school children, but they typically are not scientifically evaluated and do not include an aerobic component.

Need for the Study

Of all the psychological variables that determine emotional adjustment, self concept is probably the most critical. What we think about ourselves is probably the central concept in our conscious lives (McGuire & Padawer-Singer, 1976). Hamachek (1992) defines self concept as "that particular cluster of ideas and attitudes we have about ourself at any given moment" (p. 26) while self esteem is "the evaluative or affective dimension of self concept" (p. 31).

Self concept has been associated with overall academic achievement (Felker, 1974; Shavelson, Hubner, & Stanton, 1976), reading achievement (Wattenberg & Clifford, 1964), classroom participation and the possession of social skills (Coopersmith, 1967), and participation in extracurricular activities and the attainment of leadership status (Rosenberg, 1965). The development of a positive self concept is posited as a desirable goal in personality and child development, in clinical treatments, and in education.

One method of developing the foundation for a healthy self concept is through aerobic exercise. Exercise among adults has many benefits, both physiologically (e.g., Harper, 1979) and psychologically (e.g., Greist, Klein, Eischens, Faris, Gurman, & Morgan, 1979; Sachs & Buffone, 1984). Walking and jogging programs among adults have lead to significant improvements in self esteem, self respect, and body image (Carmack & Martens, 1979; Hawkins, 1981).

Purpose of the study

Several researchers, (Brown, 1982; Cooper, Purdy, Friedman, Bohannon, Harris, & Arends, 1975; Duncan, Boyce, Itami, & Puffenbarger, 1983) have found appropriate physical activity to be a foundation for long term physical and emotional well-being into adulthood. Young children most often cite physical characteristics and appearance when asked to describe themselves (Rosenberg, 1979; Sonstroem & Morgan, 1989) and most of the current self concept models contain a physical appearance and/or physical ability factor.

Although adults have benefitted from the physical fitness movement, children are not being reached by this current trend (Corbin, 1986; Hinkle & Tuckman, 1987; Jenkins & Staub, 1985). Notwithstanding, studies have shown aerobic conditioning can improve cardiorespiratory functioning in children (Cooper et al., 1975; Duncan et al. 1983; Hinkle, 1987; Siegel & Manfredi, 1984; Tuckman & Hinkle, 1986). Psychological effects have not been as thoroughly tested, but increases in self concept have been found among subjects initially lower in this trait (Hilyer & Mitchell, 1979; McGowan, Jarman, & Pedersen, 1974).

Running has been researched the most thoroughly and applied the most often as a psychological intervention (Hinkle, 1988). Even though it is one of the most difficult forms of aerobic exercise, it is among the best at promoting psychological health (Glasser, 1976; Harper, 1979). Children

and adolescents find running to be the most readily accessible aerobic exercise in terms of skill development, costs, and availability (Hinkle, in press).

In general, few studies have been done with elementary school children (Brown, 1982; Lopez & Pruett, 1982; Lund & Kegeles, 1982; Hinkle, 1993) and even fewer have examined the relationship between self concept development and physical activity (Keller, 1982). Most studies have been conducted with special needs populations and contained numerous methodological flaws (Folkins & Sime, 1981; Hinkle, 1993; Labbe & Welsh, 1993).

The purpose of this study is to extend our knowledge by examining the relationship between running and self concept development among 8 to 11 year olds who have volunteered to participate in an after school running program supervised by an elementary school teacher.

CHAPTER II

A REVIEW OF THE LITERATURE

In their comprehensive literature review of physical fitness training and mental health, Folkins and Sime (1981) determined that self concept was the variable with the "highest payoff" in exercise-personality research. They concluded that physical fitness training promotes improved mood, self concept, and work behavior. Ismail and Trachtman (1973) described this phenomenon succinctly when stating, "physical activity can change the state of one's mind" (p. 82). A consensus statement from the National Institute of Mental Health (1984) concluded that exercise could have beneficial emotional effects across all ages and sexes.

After reviewing the literature on exercise and self esteem, Sonstroem (1984) called for more sensitive instrumentation that differentiated global from specific aspects of self concept. In a current review of the literature, Welsh and Labbe (in press), called for better description of the independent variable and monitoring of heart rates to ensure that participants were obtaining an aerobic benefit. Although viewed as a prime component of self concept, minor emphasis has been given to the role of physical

activity in self concept enhancement.

In 1985 and again in 1987, the National Children and Youth Fitness Studies (NCYFS) were commissioned to objectively assess the fitness level of youth. In a summary of findings, Ross and Gilbert (1985) and Ross and Pate (1987) concluded that children had more body fat compared to their cohort twenty years ago and that increased body fat was associated with hypertension, diabetes, and heart disease (Corbin, 1986; Leon, 1983; & Ross Gilbert, 1985). Symptoms of cardiovascular disease are already evident in children as young as eight years old (Jenkins & Staub, 1985). This substantiates the U. S. Government's (U. S. Department of Health and Human Services, 1980) and Leon's (1983) claim that children are not physically fit. Americans have created a culture for their children in which people would rather spectate than participate (Wynder, Hertzberg, & Parker, 1981).

A Review of Exercise/Self Concept Research

To be included in the following literature review, a study must examine the relationship between physical activity (i.e., running) and self concept development. This review will be limited to studies with elementary or junior high school students and will focus on the regular education population. Because of the lack of research in this area, studies that contain methodological shortcomings and are pre-experimental in design (Campbell & Stanley, 1963) will be

included. Few studies have used running as an independent variable so studies that used physical skills training with a negligible aerobic impact will also be reviewed.

The following review will begin with non-aerobic studies then proceed with aerobic interventions. Each will be reviewed chronologically. To be classified as aerobic, subjects should achieve an elevation in heart rate to approximately 70 - 80% of maximum capacity and sustain this level for 20 minutes (Cooper, 1978). It is recommended subjects exercise at this level a minimum of three times per week for a duration of 15-20 weeks (American College of Sports Medicine, 1988). The following non-aerobic studies did not include running as the dependent variable and incorporated primitive research designs.

Non-Aerobic Studies

Bruya (1977) taught selected basketball fundamentals (dribble, chest pass, lay up, etc.) to fourth graders but did not find increases in self concept. His study consisted of eight one half hour treatments spread evenly over four weeks that took place within the regularly scheduled physical education class. Bruya's study was quasi-experimental in design incorporating pretest-posttest measures nested within classrooms. It was very short duration and minimal intensity and did not include a measure of cardiovascular functioning.

Mauser and Reynolds (1977) did not find an increase in self concept following an eight week program of physical

activity and body coordination. Their study incorporated a small sample size of a special needs population, those with perceptual-motor deficits and accompanying difficulties in social interaction, but the authors neglected to describe the nature of the intervention. It is doubtful these elementary school subjects accrued any aerobic benefit, which may be the causal mechanism for self concept enhancement.

Another study of the effects of motor development on self concept was conducted by Martinek, Cheffers, and Zaichkowsky (1978). They observed changes in self concept after weekly participation in a physical activity program, although correlations between self concept and motor development were insignificant. Their study included heavy representation from a minority group and incorporated a true experimental design with a large sample size. Interestingly, they observed a decline in self concept over the ten weeks for children in grades three, four, and five, a finding also noted by Tuckman and Hinkle (1986). No measure of aerobic fitness was ever established.

Smith (1982) also did not find a definitive improvement in self concept following an eight week program of physical education among third grade children. Subjects were matched on demographic variables then randomly assigned to one of two treatment conditions or to a free play control group. The physical fitness interventions were games and relays or movement skills training but no cardiovascular measures were

included. Smith noted that teachers' evaluations, expectations, and behavior affected children's self concepts, a finding also observed by Smart and Smart (1977).

Aerobic Studies

One of the first aerobic studies was conducted with teenagers by Collingwood and Willett (1971). Their sample included five obese, male adolescents who underwent a short but intensive three week, thirty hour fitness program. In addition to specific physiological improvements, subjects displayed significant increases in self concept, self acceptance, and body attitudes, and decreases in real versus ideal/self discrepancy. Increases were particularly pronounced in subjects initially lower in self esteem, a finding replicated by Hilyer and Mitchell (1979) among college students and by McGowan, Jarman, and Pedersen (1974) with seventh graders. A ceiling effect on assessment instruments may have been partially responsible for this finding although children initially lower in self concept stand the most to gain from an intervention designed to increase this construct. A regression to the mean effect may have also been operating.

In general, studies conducted with special needs children have typically shown improvement in general self concept whereas studies with normal children have shown changes in specific areas of self concept (Hinkle, 1987; Tuckman & Hinkle, 1986). This finding highlights difficulties inherent in defining and measuring the multifaceted nature of the self

concept.

Collingwood and Willett (1971) did not include a control group with random assignment to treatment conditions making their study pre-experimental in design. Subjects also received a total of three hours of group counseling which hinders generalization beyond their study.

McGowan, Jarman, & Pedersen (1974) used an experimental design to study the relationship between a competitive cardiovascular fitness program and self concept development. Subjects were seventh grade boys who were low in self esteem and peer approval. At the end of 18 weeks, they found increases in self esteem for the experimental group but did not find differences in peer approval. Unfortunately, their study contained multiple incentives for participation and experimenter manipulation of success to be suspect of experimental reactivity and bias. Additionally, only within group dependent t-tests were reported with no test of comparative changes between experimental and control groups.

Percy, Dziuban, & Martin (1981) observed increases in self esteem among fifth and sixth grade public school students after participation in a seven week distance running program. The extent of aerobic fitness was never established and subjects were only required to run one mile three times a week and allowed to rest if unable to complete the one mile run. Subjects were randomly assigned to treatment or control conditions, but the researchers did not describe the nature

of the control condition. Their sample size was rather small (n=15), and subjects were not advised to limit running outside of the treatment setting. According to the authors, many of the children ran to school or on weekends.

In a study investigating both physiological and psychological effects of running among fourth, fifth, and sixth graders, Tuckman and Hinkle (1986) did not find significant increases in self concept after a 12 week running program. Unlike most of the earlier studies, they assessed aerobic impact and concluded exercise participants had better times on the 800 m run, lower pulse rates, and better performance on a test of creativity than did regular physical education (control) subjects. They noted self concept tended to be less positive with increases in grade level; a finding reported by Martinek, Cheffers, and Zaichkowsky (1978). Laudably, their study incorporated a true experimental design with random assignment to treatment or control conditions within a school setting.

In a recent controlled study, Labbe and Welsh (1993) found higher running self efficacy scores among participants after an eight week aerobic training program. No changes in general self efficacy were observed, but the finding of more focal changes in self efficacy, i.e., related to physical self concept, has been a consistent finding in the adult literature (Kaplan, Atkins, & Reinsch, 1984; Sonstroem, 1984).

Subjects were 124 children enrolled in fourth or fifth

grade that were randomly assigned to an aerobic treatment or to a regular physical education control condition. Labbe and Welsh (1993) included measures of physical fitness (body fat, resting pulse rate, and 800 m run time) and established aerobic improvement. However, a six month follow up showed most of the differences between the groups had disappeared except that the running group had a higher internal health locus of control.

In a current study of 85 eighth grade students, Hinkle, Tuckman, and Sampson (1993) found significant increases for physical fitness and creativity measures, but psychological changes were minimal and nonsignificant. An eight week follow up found no differences between experimental and control groups. This study included random assignment to a treatment or control condition and included a five day per week structured aerobic running program for eight weeks. While not encouraged to do so, control participants may have also engaged in aerobic exercise. As these researchers noted, middle school children may need to run more than one mile per day to obtain physiological and psychological changes. The Coopersmith Self Esteem Inventory (Coopersmith, 1981) may not have been sensitive to psychological changes in "normal" students.

Summary of Exercise/Self Concept Research

Of the ten studies reviewed investigating the relationship between aerobic activity and self concept in this age group, five noted positive changes in self concept (Collingwood & Willett, 1971; Labbe & Welsh, 1993; Martinek, Cheffers, & Zaichkowsky, 1978; McGowan, Jarman, & Pedersen, 1974; and Percy, Dziuban, & Martin, 1981) while five showed no or insignificant improvement (Bruya, 1977; Hinkle, Tuckman, & Sampson, 1993; Mauser & Reynolds, 1977; Smith, 1982; and Tuckman & Hinkle, 1986). Many of the early studies attempted to show a correlation between self concept development and physical skills training and lacked aerobic intensity (e.g., Bruya, 1977) or failed to adequately measure, or even describe, cardiovascular performance (e.g., Martinek, Cheffers, & Zaichkowsky, 1978; Mauser & Reynolds, 1977). Most studies were typically less than eight weeks duration and lacked an equivalent control group. The three most recent and methodologically robust studies (Hinkle, Tuckman, & Sampson, 1993; Labbe & Welsh, 1993; Tuckman & Hinkle, 1986) did not show improvement in global self concept after documented physical fitness effects. At present, no firm conclusions can be drawn regarding the relationship between aerobic activity and self concept enhancement among elementary school students (Welsh & Labbe, 1994).

CHAPTER III

METHOD AND PROCEDURES

Procedure

The present study was quasi-experimental (Campbell & Stanley, 1963) incorporating a pre-post test design with repeated measure on dependent variables. A general schematic of the study can be located in Figure 1.

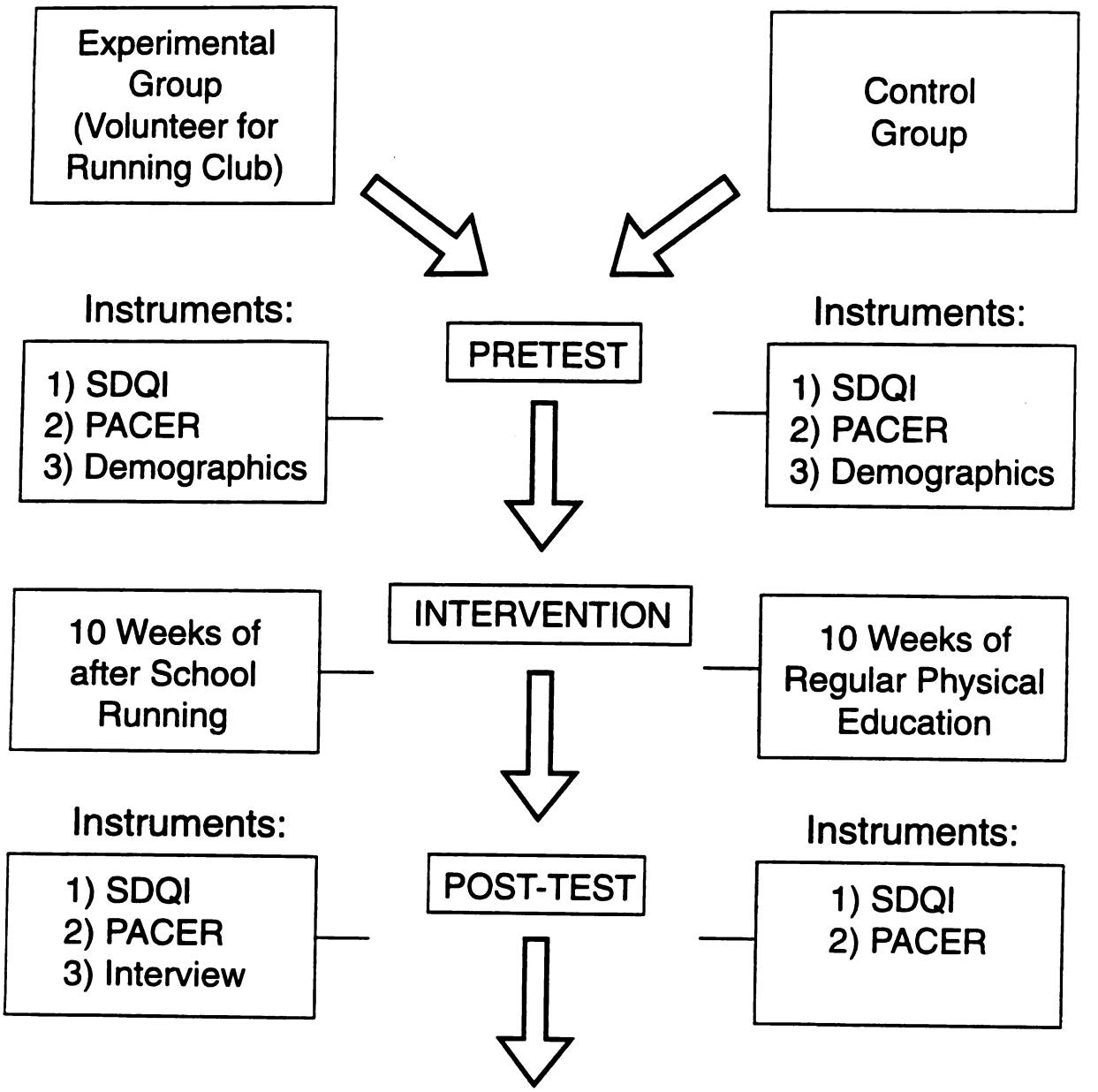


Figure 1
Flow Chart of Experimental Design

Due to self selection into the program, a comparison group was the most appropriate because subjects could not be completely randomized into treatment and control conditions. All subjects who expressed interest in the Running Club were allowed to participate. Parental consent was obtained prior to participation in the study and subjects were briefed at the conclusion of the intervention. All data were held strictly confidential and will only be reported in the aggregate. An introductory letter, program rules, and consent forms are located in Appendices A and B. A demographic data sheet (Appendix C) was compiled from school files and included: name, date of birth, gender, grade, race, teacher, and educational programming.

It was anticipated that some students would not be able to complete the study due to medical or behavioral complications. When injuries or behavioral problems occurred, the student was referred to the school nurse or principal for further evaluation. Program flexibility was stressed due to children having varying fitness and motivational levels and because of its contribution to increased compliance and adherence to a running program (Doan & Scherman, 1987). Following Hinkle and Tuckman (1987), emphasis was on a commitment to fitness and self improvement rather than on competition and winning.

Implementation of the running regimen included a walking, jogging, running progression suggested by Berg (1976) with

children gradually increasing the time they spend running without stopping. Youngsters were to spend 20 minutes engaged in continuous aerobic activity and work their way up to 45 minutes as their physical condition improved.

No attempt was made to enhance or restrict the physical activity of children outside the experimental or control conditions. This approach was consistent with that of Siegel and Manfredi (1984) and Tuckman and Hinkle (1986). This was necessary because of the impractibility of controlling children's activity outside of the school day.

This experiment coincided with the school calendar and commenced with pretesting in April of 1994 and concluded with post testing the last week of school in June, 1994. Thus, it lasted approximately 10 weeks. Previous studies indicated that the minimum time required for cardiovascular changes to occur is eight to ten weeks (Simons, McGowan, Epstein, & Kupfer, 1985). At both assessment periods, students were given paper and pencil measures of self concept before completing fitness testing.

Subjects

Subjects were third, fourth, and fifth grade students from an elementary school in Lansing, Michigan, and ranged in age from 7 to 11 years. The school is located in the downtown district and includes a large minority population. Experimental subjects were chosen by their desire to

participate in the Running Club, while control subjects were selected from the remaining students in the appropriate grades. Dropouts were defined as those subjects originally included in the experimental group who no longer ran after school with the Running Club.

To account for the influence of self selection into the Running Club, an equivalent control group was formed. These subjects participated in gym class three times a week supervised by their regular grade teacher or by the physical education instructor. They engaged in typical physical education activities that normally do not promote intense cardiovascular benefits (Ross & Gilbert, 1985). Control subjects completed the psychological inventory and physical fitness assessments concurrently with experimental subjects.

The Independent Variable

The intervention was implemented by an elementary school teacher, this researcher, and parent volunteers and consisted of ten weeks of after school running. The club met from approximately 3:05 - 3:45 pm on Tuesdays, Wednesdays, and Thursdays along a measured course located on the playground of an urban elementary school. Five laps around the school was equivalent to one mile. This distance was measured using a pedometer according to standards developed by the American Alliance for Health, Physical Education, Recreation, and Dance (1980).

Students ran a minimum of twenty minutes after school three times a week for a total of ten weeks. Twenty minutes of continuous aerobic activity three to four times per week is the minimum exercise necessary to produce a cardiovascular benefit (American College of Sports Medicine, 1988; Cooper, 1978; Martin & Dubbert, 1987). Students were encouraged to run as many laps as possible in 45 minutes and to maintain target heart rates. A target heart rate was defined as 60%-90% of an individual's maximum heart rate, which is approximately 160 beats per minute for children in this age range. Standards for children's programs are essentially the same as adults (Bar-Or, 1983; Simmons-Morton, O'Hara, Simmons-Morton, & Parcel, 1987) but no exact guidelines have been published (American College of Sports Medicine, 1988; Welsh & Labbe, in press). Subjects were trained to check their radial pulse rates by counting the number of beats in six seconds and multiplying by ten.

To reduce injury, students were required to participate in stretching and cool down activities and allowed to drink fluids as necessary. They were encouraged to compete against themselves, chart their progress, and gradually increase their mileage and speed.

Measurement and Instrumentation

Measurement was conducted on a pre-post test basis with psychological testing separated from the playground to control

for possible experimental reactivity. As suggested by Labbe and Welsh (1993), this study attempted to examine physical fitness and psychological variables concurrently to show whether physical fitness changes are necessary to produce psychological changes.

Self concept data was obtained on an individual basis while the PACER, a measure of aerobic capacity, was administered to groups of up to six children. The children that were not running observed other students and assisted with record keeping. The SDQI was read to the children to control for the effect of reading ability. An attempt was made to have dropouts complete the same measures, including post tests, as other participants. While dropping out was discouraged, enough children chose this option and formed a separate group that was analyzed separately. The PACER and the SDQI are located in Appendixes D and E, respectively.

The Progressive Aerobic Cardiovascular Endurance Run (PACER)

The 20 Meter Shuttle Test (20 MST) or the Progressive Aerobic Cardiovascular Endurance Run (PACER) was developed by Leger and Lambert (1982) to simulate a graded exercise test performed on a treadmill. The PACER is a valid, fun, alternative to the customary distance run test for measuring aerobic capacity in children. It can be conducted on a playground gym and requires children to run shuttles or laps between parallel lines placed 20 m apart. The test consisted of one minute stages of continuous incremental pace running

set to music and tones on a prerecorded tape. After practice trials were held prior to actual testing, children were allowed 9 seconds to run/walk the 20 m distance during the first minute. Each minute thereafter, the pace increased by approximately one-half second per level. Subjects lined up and ran back in time with auditory signals from the tape. The experimenter also gave a hand signal for those subjects that had difficulty hearing the beep. When a subject stopped or failed to reach the end line before the beep on three shuttles, the last shuttle (lap) was recorded and the test concluded for that child. Each time a person could not keep up with the beep, the subject was given a warning and encouraged to pick up the pace (Institute for Aerobics Research, 1987).

The PACER has adequate psychometric properties with test-retest reliabilities ranging from .87 for females and .91 for males (Liu, Plowman, & Looney, 1992). Leger, Mercier, Gadoury, and Lambert (1988) found a reliability coefficient of .89 among 6-16 year olds of both sexes while Dinschel (1994) found a comparable reliability among fourth and fifth graders. Correlations with maximum volume oxygen uptake (VO2 max) achieved on a treadmill ranged from .51 to .90 for both heterogeneous and homogeneous groups of subjects (Liu et al., 1992; Boreham, Paliczka, & Nichols, 1990). While these relationships are only moderate, correlations between VO2 max achieved on a treadmill and endurance runs of 600 yards, 1600

m, 9 minutes, and 12 minutes ranged from .61 to .94 spanning the entire age range of subjects (Safrit, 1990). Cureton (in press) concluded validity coefficients and standard errors of estimate are similar to those for the one mile run/walk, indicating that the PACER has moderate concurrent validity as a field test of VO2 max.

The PACER has several advantages over traditional endurance runs: (1) it can be conducted indoors within a small space such as a gym, (2) problems inherent in long distance runs such as pacing and motivation are largely eliminated, and (3) it discriminates well between fit and less fit subjects.

The Self Description Questionnaire I (SDQI)

The Self Description Questionnaire I (SDQI) (Marsh, Barnes, Cairns, & Tidman, 1984) is a 76 item measure based on the revision of the original Shavelson, Hubner, and Stanton (1976) hierarchical model of self concept. This revised model (Marsh & Shavelson, 1985) can be located in Figure 2.

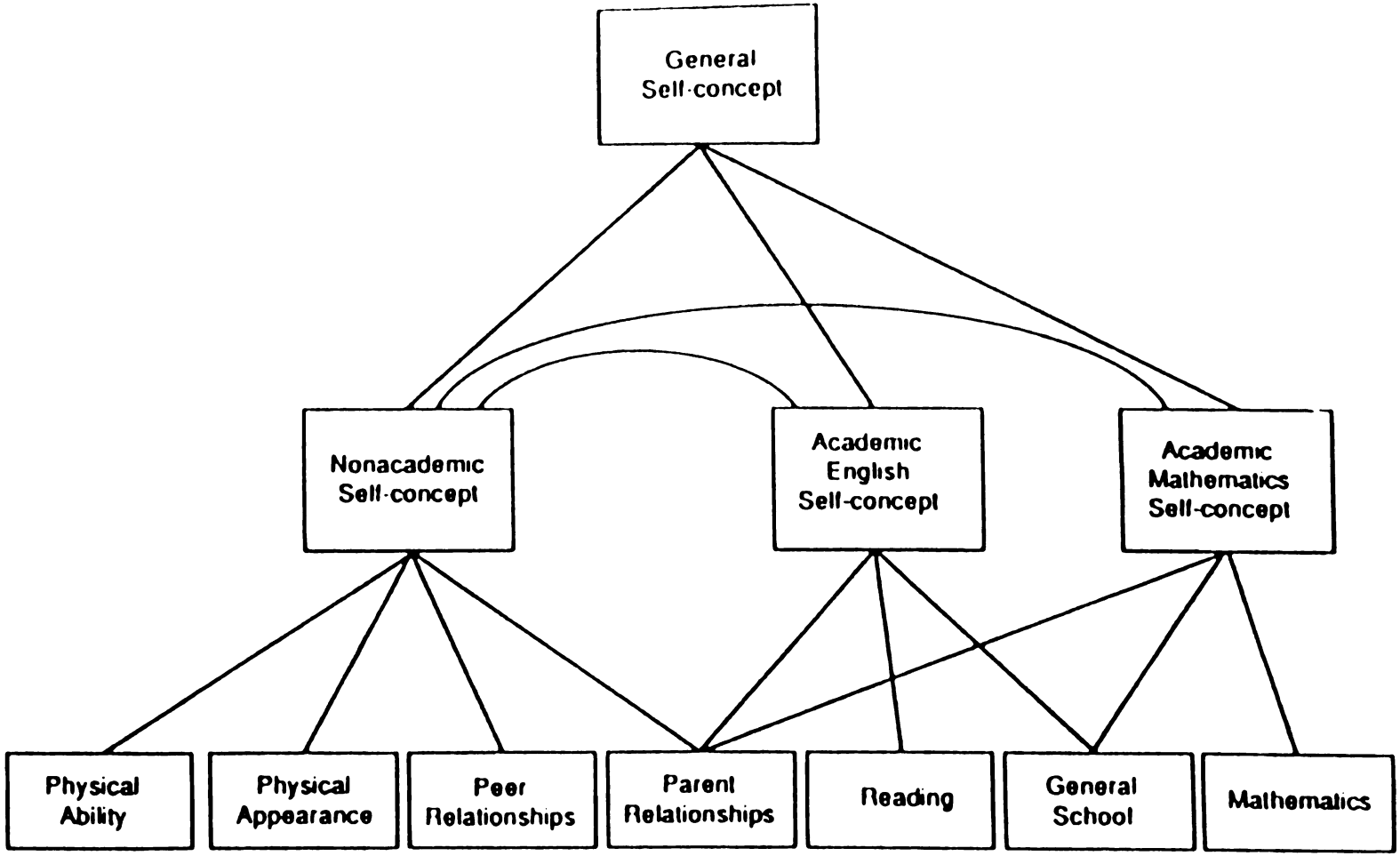


Fig. 2. An empirically based representation of the hierarchical organization of self-concept inferred from responses to the Self-Description Questionnaire I that served as the basis of the Marsh/Shavelson revision of the original Shavelson *et al.* (1976) model shown in Fig. 1. From Marsh and Shavelson (1985), adapted by permission.

The SDQI is a recently developed multidimensional self concept measure and is appropriate for children ages 6 to 11. Children responded to items along a 5 point scale ranging from mostly false (1) to mostly true (5). The questionnaire taped seven specific factors and four global areas from the Shavelson et al. (1976) model that have been supported through confirmatory and multitrait-multimethod factor analyses (Marsh, Smith, & Barnes, 1982). A General-Self scale, derived from the Rosenberg (1965, 1979) Self Esteem Scale is also included. Specific scores are reported for physical abilities, physical appearance, relationships with peers, relationship with parents, reading, mathematics, and general school subjects. Global scores are aggregates of these specific factors and include a total nonacademic self concept, a total academic self concept, a total self concept, and a general self concept that correlates with all factors in the model.

Research has shown that negatively worded items tend to reduce reliability at the younger ages and are not included in the scoring (Wylie, 1989) but serve as a deterrent to a positive response set (Marsh, 1990). Coefficient alphas for the seven individual scale scores varied from .80 to .92 (median =. 86). Alphas for the Total Nonacademic, Total Academic, and Total Self scores were .91, .92, and .94 respectively (Marsh, 1990). Internal consistency without the negatively worded items ranges from .80 to .90 across the

various subscales but are somewhat lower for second and third graders (Wylie, 1989).

Factor analysis of the first seven subscales reveal that each define their own factor with negligible cross loadings (Marsh, Barnes, Cairns, & Tidman, 1984). However, support for a general self concept at the apex of the hierarchy is less conclusive (Wylie, 1989). Stability and systematic changes in self concept were examined in two studies (Marsh, Smith, Barnes, & Butler, 1983). In both studies, the reliability of the difference scores had means of .74 for the individual scales and .87 for total scales. Construct validity of the SDQI has been established through multitrait-multimethod analysis with the Coopersmith Self Esteem Inventory, the Sears Self-Concept Inventory and Harter's Perceived Competence Scale for Children (Marsh & Smith, 1982).

Hypotheses

This study examined the following research hypotheses:

1. As a result of the after school running program, subjects will derive cardiovascular benefits as indicated by increased post test performance on the Progressive Aerobic Cardiovascular Endurance Run (PACER).

2. Aerobic activity (running) will lead to significant increases in children's self concept in the specific areas of physical ability and physical appearance as assessed by the Self-Description Questionnaire I (SDQI).

3. Children will improve their peer self concept as a result of the social +interaction and group format of the after school running program. These changes will be noted by increased scores on the peer self concept component of the SDQI.

4. Improvement in the global aspect of self concept, namely total self concept on the SDQI, will significantly increase as a result of participation in the after school running program.

CHAPTER IV

ANALYSIS OF RESULTS

Sample Characteristics

A total of 70 subjects participated in this study. An examination of Table 1 reveals the large number of dropouts, originally from the experimental group, who failed to complete the ten week study. The control group was also limited in number as most children who were interested in the study chose to be in the experimental group.

Slightly more males than females were included among the experimental and dropout groups, however males were under-represented in the control group.

Table 1
Gender of Subjects

	Experimental	Control	Dropout
Male (34)	16 (55%)	3 (21%)	15 (56%)
Female (36)	13 (45%)	11 (79%)	12 (44%)
Total (70)	29	14	27

More nonwhites than whites participated in the experimental group while whites were the majority among the control and dropout groups. This demographic breakdown by race can be found in Table 2.

Table 2
Race of Subjects

	Experimental	Control	Dropout
White (38)	12 (41%)	10 (71%)	16 (59%)
Nonwhite (32)	17 (59%)	4 (29%)	11 (41%)
Total (70)	29	14	27

Because of the small number of subjects in the second and sixth grades, 7 and 12 year olds were collapsed into the adjacent age categories. The majority of subjects were 9 and 10 year olds; mean age of the subjects was 9.6 years. The cells of the control group were unevenly distributed across all age categories with some cells having as few as 2 subjects. Eleven and twelve year olds displayed a tendency to drop out more frequently than other age categories. The breakdown by age can be seen in Table 3.

Table 3
Age of Subjects

	Experimental	Control	Dropout
7-8 (10)	5 (17%)	2 (14%)	3 (11%)
9 (23)	9 (31%)	5 (36%)	9 (33%)
10 (19)	9 (31%)	5 (36%)	5 (19%)
11-12 (18)	6 (21%)	2 (14%)	10 (37%)
Total	29	14	27

Students who were receiving Chapter 1 services for reading or bilingual education were included in the special education category because they were too few in number to form their own group. Moreover, this group was not completely independent as some children were receiving Chapter 1 services or bilingual education and special education services concurrently. Overall, there were a large number of students from special education who participated in the study; approximately 39% of the sample. These subjects had no obvious physical handicaps and were approximately equally divided among experimental, control, and dropout groups. Similar to other demographic categories, the fewest number of subjects were in the control group with only five subjects from special education and nine from regular education represented. This distribution can be seen in Table 4.

Table 4
Educational Programming of Subjects

	Experimental	Control	Dropout
Regular Ed (43)	18 (62%)	9 (64%)	16 (59%)
Special Ed (27)	11 (38%)	5 (36%)	11 (41%)
Total	29	14	27

Reliability of the SDQI

An analysis of the reliability of the eleven factors of the SDQI showed each factor to have adequate internal reliability. Sixty-eight out of the original 70 subjects completed the protocol at pretesting while 64 completed the SDQI upon posttesting. Two students moved out of the school district and were subsequently dropped from the study. Coefficient alphas ranged from .77 to .94 at pretesting and from .61 to .94 at posttesting. The reliability of the total scale was in the .90s at both times of assessment, indicating strong internal consistency. These results are consistent with those reported in the SDQI manual (Marsh, 1990) and with a review published by Wylie (1989). A complete summary of reliability coefficients (internal consistency) for the SDQI factors is located in Table 5.

Table 5
Reliability Analysis of the SDQI

Scale	Pretest (N=68)	Posttest (N=64)
1.) Physical Ability	.78	.61
2.) Physical Appearance	.89	.91
3.) Peer Relationships	.87	.76
4.) Parental Relationship	.83	.79
5.) Reading	.86	.85
6.) Mathematics	.91	.93
7.) School	.84	.85
8.) General	.79	.82
9.) Nonacademic	.92	.89
10.) Academic	.92	.92
11.) Total	.94	.94

General statistical design

SPSS was used to analyze the data on the University computer system. Due to the lack of randomization to treatment conditions, statistical control was necessary to equate pretest differences between groups. The small number of cases indicated a repeated measure, multivariate analysis of variance (MANOVA) rather than an analysis of covariance (ANCOVA).

A multivariate repeated measure analysis with all demographic variables added simultaneously could not be conducted due to the creation of empty cells. Similarly, in order for the ANCOVA to be effective, the covariates must be linearly related to the dependent variable and unaffected by manipulation of the experimental variable. If pretest scores were used as covariates, this assumption would not be met. During the preliminary analysis, covariates were significant in all cases.

A repeated measure MANOVA was used to examine the effect of the treatment on changes in the SDQI while controlling for the effects of four salient demographic variables: gender, age, educational programming, and race. While all eleven factors of the SDQI were included in the analysis, the main focus was on the PACER and the hypothesized self concept variables. After computing descriptive statistics for demographic variables and checking for outliers or possible coding errors, cross tabs and chi-squares were used to check

the distribution of the sample. These results were nonsignificant, which lead to collapsing certain categories such as educational programming (regular education, special education, Chapter 1, and bilingual education) into one dichotomous variable; regular education and special education. This created larger sample sizes within cells and more statistical power.

In all, three analyses were conducted on the data. In the preliminary analysis, simple, one factor ANOVA's were calculated for the PACER and SDQI factors based solely on group membership. Pre and post test scores were examined without a repeated measure and were likely influenced by gender and other demographic variables.

In the second analysis, gender and racial differences were examined on the PACER and SDQI factors independent of group membership. Again, this test was run using a simple ANOVA without a repeated measure and was necessary to determine if demographic variables were confounded within group membership. Main effects for race and gender were noted.

In the final and most robust analysis, group effects were analyzed using a repeated measure multivariate analysis of variance with four demographic variables added individually to the model. By including the demographic variables, their interaction with the outcome variable could be determined. These variables were not added simultaneously because of the

small number of subjects in the study and the low frequencies within cells this would have created. This design was similar to a covariate analysis even though the demographic variables were not technically covariates because they lacked independence with dependent measures.

Results of physical activity (PACER scores) will be presented first followed by an analysis of the self concept factors according to experimental hypotheses. The alpha for statistical tests was set at $p < .05$.

Results of hypothesis testing

Research hypothesis # 1:

As a result of the after school running program, subjects will derive cardiovascular benefits as indicated by increased posttest performance on the Progressive Aerobic Cardiovascular Endurance Run (PACER) [not supported].

Significant differences for overall means were found between the three groups on the PACER. As expected, those subjects who self-selected into the Running Club achieved a higher mean than control subjects but only slightly higher than experimentals who eventually dropped out of the study, $F(2,64) = 4.54$, $p < .05$. A comparison of means for the three groups and the corresponding ANOVA can be found in Table 6 and Figure 3. An examination of Table 6 reveals that PACER performance did not increase significantly over pretest levels

as hypothesized $F(1,64) = 1.84$, $p > .05$, nor was there any interaction between group membership and PACER performance $F(2,64) = .60$, $p > .05$.

Ironically, subjects in the control group showed the greatest amount of improvement and increased by three laps while experimental subjects increased by less than two laps. Large standard deviations were noted for both the experimental and dropout subjects. Although no current norms are available for the PACER, the grand mean for this research sample was 21.9 laps at pretesting and 23.4 laps at posttesting.

Table 6
A Comparison of PACER Scores from Pretest to Posttest

	Pretest		Posttest		
Group	M	SD	M	SD	n
Experimental	24.8	12.2	26.7	13.0	27
Control	13.1	6.0	16.1	8.8	14
Dropouts	23.9	12.9	23.8	15.0	26

Analysis of Variance

Source	df	F
Between subjects		
Within Cells	64	(262.83)
Group	2	4.54*
Within subjects		
Within Cells	64	(42.91)
PACER	1	1.84
Group X PACER	2	.60

* $p < .05$.
Note. Values enclosed in parentheses represent mean square errors.

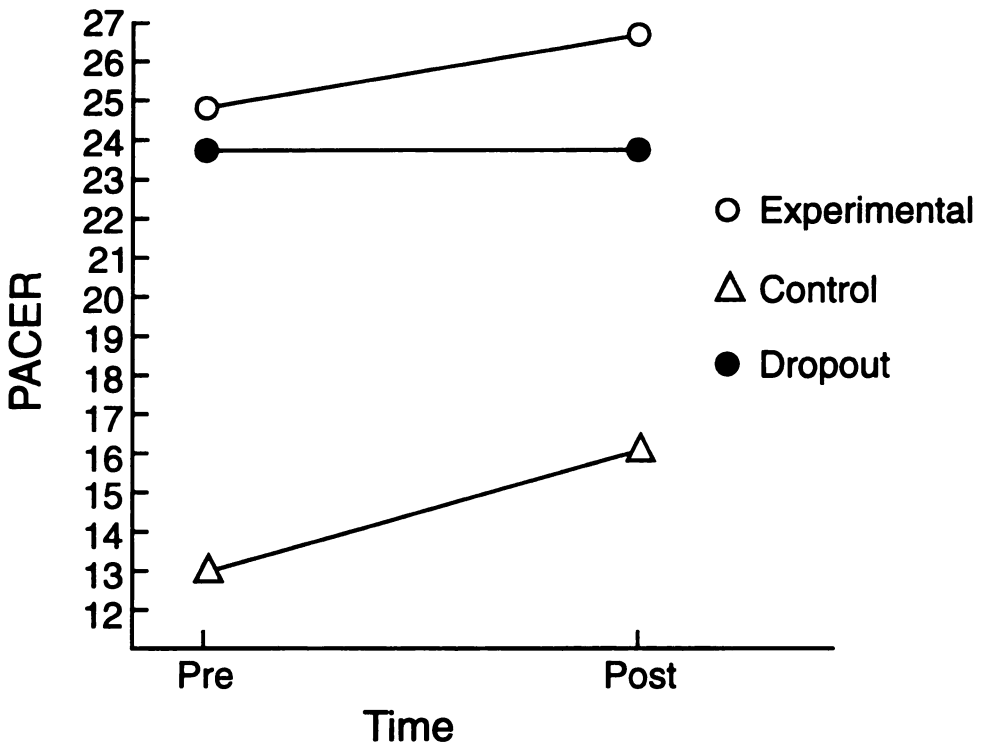


Figure 3
A Comparison of PACER Scores from Pretest to Posttest

Research hypothesis # 2:

Aerobic activity (running) will lead to significant increases in children's self concept in the specific areas of physical ability and physical appearance as assessed by the Self-Description Questionnaire I (SDQI) [not supported].

There were no significant differences between groups on the their self concept of physical ability $F(2,61) = .06$, $p > .05$. Results and the associated ANOVA can be found in Table 7.

As was the case with the Pacer, no significant differences were found for the children's self concept of physical ability between pre and post testing $F(1,61) = 1.14$, $p > .05$. There was no interaction between group status and self concept of physical ability $F(2,61) = .60$, $p > .05$. Students gained an average of less than one point on the items that comprised this scale.

Table 7
A Comparison of Physical Ability Scores from Pretest to Posttest

	Pretest		Posttest		
Group	M	SD	M	SD	n
Experimental	33.9	5.0	33.7	5.4	26
Control	32.7	7.1	33.7	4.4	14
Dropouts	33.1	5.8	34.0	4.7	24

Analysis of Variance		
Source	df	F
Between subjects		
Within Cells	61	(47.60)
Group	2	.06
Within subjects		
Within Cells	61	(8.66)
Phys Abil	1	1.14
Grp X Phys Abil	2	.60

Note. Values enclosed in parentheses represent mean square errors.

No significant differences were found for the three groups on the physical appearance scale of the SDQI $F(2,61) = 2.27$, $p > .05$. At posttesting there was a significant change in physical appearance for the three groups $F(1,61) = 4.18$, $p < .05$, but this improvement applied to control as well as experimental subjects. A comparison of pre and post test means can be found in Table 8 and in Figure 4.

There was no interaction between group membership and physical appearance $F(2,61) = 1.23$, $p > .05$. Controls actually gained more than experimentals while dropouts decreased slightly in their ratings.

Table 8
A Comparison of Physical Appearance Scores from Pretest to Posttest

	Pretest		Posttest		
Group	M	SD	M	SD	n
Experimental	30.6	9.3	32.6	7.8	26
Control	29.5	6.5	32.9	6.2	14
Dropouts	27.4	8.4	27.3	9.0	24

Analysis of Variance		
Source	df	F
Between subjects		
Within Cells	61	(111.11)
Group	2	2.27
Within subjects		
Within Cells	61	(24.12)
Appearance	1	4.18*
Grp X Appr	2	1.23

*$p < .05$.
Note. Values enclosed in parentheses represent mean square errors.

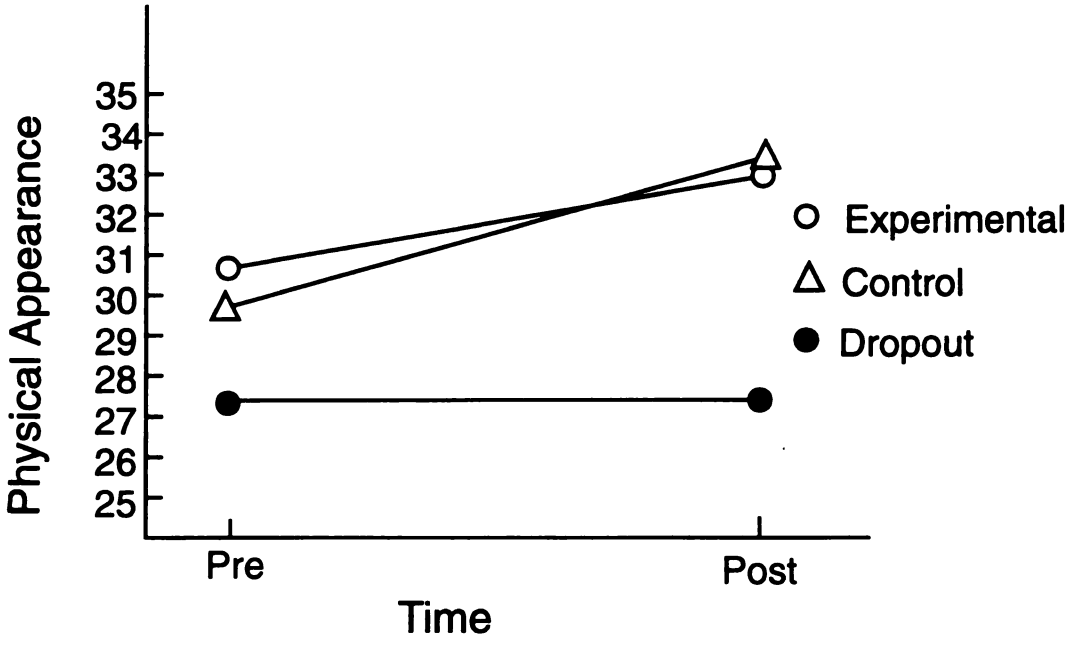


Figure 4
Self Concept of Physical Appearance by Group

Research Hypothesis # 3:

Children will improve their peer self concept as a result of the social interaction and group format of the after school running program. These changes will be noted by increased scores on the peer self concept of the SDQI [not supported].

There were no overall differences between means for the three groups on the peer self concept scale $F(2,60) = .16$, $p > .05$. Complete results can be located in Table 9. As a result of the intervention, groups increased about one point (experimental group) to a little over two points (control group) at posttesting, but not enough to produce a significant main effect $F(1,60) = 3.72$, $p > .05$. Interactions were not observed between peer self concept and group status $F(2,60) = .27$, $p > .05$. The experimental group showed the least amount of improvement on this variable.

Table 9
A Comparison of Peer Self Concept Scores from Pretest to Posttest

	Pretest		Posttest		
Group	M	SD	M	SD	n
Experimental	30.5	8.0	31.2	6.4	26
Control	29.9	7.9	32.1	4.9	14
Dropouts	29.1	7.8	30.8	5.7	23

Analysis of Variance

Source	df	F
Between subjects		
Within Cells	60	(76.67)
Group	2	.16
Within subjects		
Within Cells	60	(19.70)
Peer	1	3.72
Grp X Peer	2	.27

Note. Values enclosed in parentheses represent mean square errors.

Research hypothesis # 4:
Improvement in the global aspect of self concept, namely total self concept on the SDQI, will significantly increase as a result of participation in the after school running program [not supported].

The groups did not differ on their overall means for total self concept $F(2,60) = .54$, $p > .05$. There were no significant increases $F(1,60) = 1.81$, $p > .05$, or interactions $F(2,60) = .08$, $p > .05$ as a result of the intervention. The maximum gain by any group was only one point. Means and the ANOVA for this factor can be seen in Table 10.

Table 10
A Comparison of Total Self Concept Scores from Pretest to Posttest

	Pretest		Posttest		
Group	M	SD	M	SD	n
Experimental	31.6	5.0	32.2	4.4	26
Control	31.7	4.5	32.7	4.5	14
Dropouts	30.6	4.9	31.2	4.6	23

Analysis of Variance

Source	df	F
Between subjects		
Within Cells	60	(36.49)
Group	2	.54
Within subjects		
Within Cells	60	(7.82)
Total	1	1.81
Grp X Total	2	.08

Note. Values enclosed in parentheses represent mean square errors.

None of the self concept variables showed significant improvement as a result of the after school running program except physical appearance. For this factor, however, there was no interaction between group membership and self concept and even the control group increased on this measure.

Supplementary analysis

A number of unexpected findings occurred that were not included in the original hypotheses. These findings often involved treatment by subject interactions or were related to demographic differences between subjects. In any event, they provide opportunities for future research and will be discussed briefly. Significant findings related to PACER performance will be reported first followed by an analysis of self concept factors. ANOVA tables are not included unless significant results, specific to the intervention, were found. Sample sizes are enclosed in parentheses.

Pacer performance

When Pacer scores were examined with the demographic variables, (gender, age, educational programming, and race) added individually to the model, some interesting results were obtained.

Special education status had a significant relationship with aerobic capacity. Students in special education had lower aerobic scores than did regular education students

regardless of treatment condition $F(1,48) = 7.11$, $p \leq .01$. Means and the corresponding ANOVA can be located in Table 11.

Although the sample size was small (n=10), it is interesting to speculate why differences occurred between regular education and special education students. One would not expect special education status to have a significant bearing for better or worse on a measure of physical endurance. This difference between regular and special education students may relate more to effort expended and the drive to push oneself that may be more intensely felt among regular education students.

Despite overall mean differences between regular and special education students, there was no interaction between group status and PACER scores at posttesting. Exercise did not increase aerobic capacity for special ed students beyond what it did for students from regular education. (Actual performances showed small increases for regular education students and negligible gains or slight decreases for special education students).

Table 11
PACER Scores by Educational Programming

	Pretest		Posttest	
Group	M	SD	M	SD
Experimental				
regular ed (17)	26.3	11.6	28.8	12.7
special ed (6)	21.8	15.2	21.3	16.5
Control				
regular ed (9)	15.4	5.7	18.6	8.1
special ed (2)	7.0	4.2	5.0	1.4
Dropouts				
regular ed (16)	23.5	11.5	24.8	15.0
special ed (4)	9.3	3.6	10.3	4.3

Analysis of Variance

Source	df	F
	Between subjects	
Within Cells	48	(240.55)
Group	2	3.98*
Spec Ed	1	7.11**
Grp X Spec Ed	2	.56

*$p < .05$.
** $p < .01$.
Note. Values enclosed in parentheses represent mean square errors.

There was also a significant difference between ethnic groups on overall PACER performance as nonwhites outscored whites, except among control subjects, $F(1,61) = 4.02$, $p < .05$. Specific results and the ANOVA can be seen in Table 12. There were no interactions between race and treatment or between group status and treatment for this variable.

Table 12
PACER Scores by Race

	Pretest		Posttest	
Group	M	SD	M	SD
Experimental				
whites (12)	20.1	11.1	20.1	12.4
nonwhites (15)	28.4	12.2	32.0	11.3
Control				
whites (10)	13.7	6.3	16.6	8.8
nonwhites (4)	11.8	5.7	15.0	9.8
Dropouts				
whites (15)	19.8	13.0	20.0	14.7
nonwhites (11)	29.5	11.0	29.0	14.5

Analysis of Variance

Source	df	F
Between subjects		
Within Cells	61	(235.18)
Group	2	4.52*
Race	1	4.02*
Grp X Race	2	1.32

*$p < .05$.
Note. Values enclosed in parentheses represent mean square errors.

Physical Ability

On the physical ability scale of the SDQI, males reported higher scores than did females during both points of assessment. This difference held regardless of group status and was observable among control subjects as well. Means for males and females on physical ability and the corresponding statistical analysis can be found in Table 13.

There was also a significant interaction between group membership, gender, and physical ability $F(2,58) = 4.34$, $p < .05$. For males in the experimental and control groups, there were negligible increases in physical ability at posttesting. For dropouts, there was a decrease of slightly more than one point in their ratings of physical appearance.

For females, the effects were much different. Female dropouts gained a significant amount (3.2 points) while females in the control group showed an increase of a little over one point. Surprisingly, female experimental subjects lost about a point and one half at posttesting. Thus for female subjects, there appeared to be a slight advantage in not participating in the aerobic activity. The effects of this interaction can be seen graphically in Figure 5.

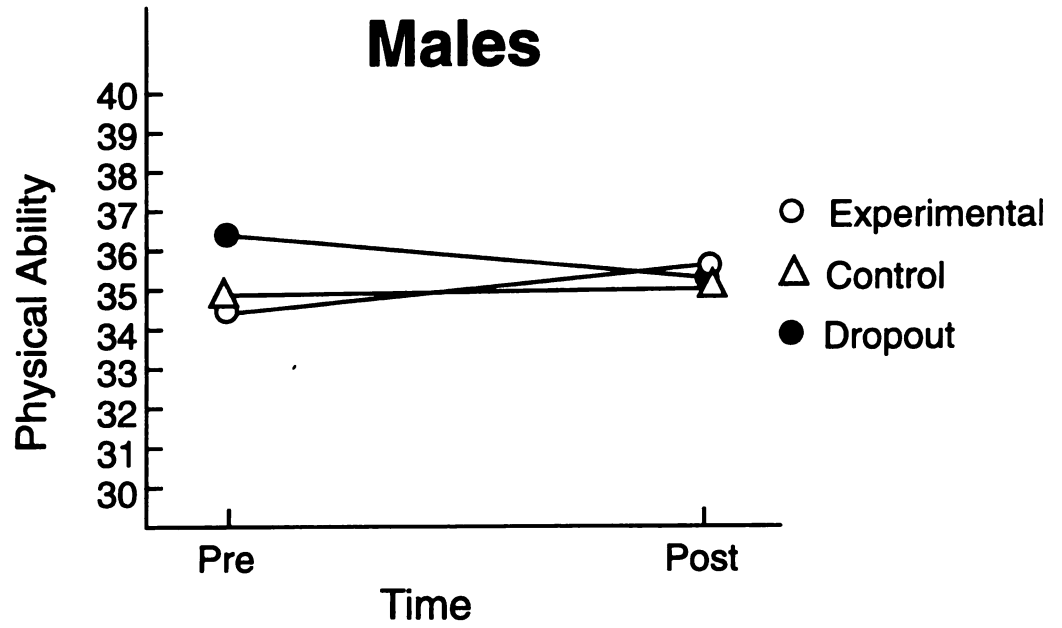
Table 13
Self Concept of Physical Ability by Gender

	Pretest		Posttest	
Group	M	SD	M	SD
Experimental				
males (15)	34.6	4.9	35.3	3.9
females (11)	32.9	5.2	31.5	6.5
Control				
males (3)	34.7	5.8	35.0	3.6
females (11)	32.1	7.5	33.3	4.6
Dropouts				
males (12)	36.4	3.6	35.2	3.9
females (12)	29.7	5.7	32.9	4.5

Analysis of Variance

Source	df	F
	Within subjects	
Within Cells	58	(7.81)
Phys Abil	1	.59
Grp X Phys Abil	2	.73
Sex X Phys Abil	1	.79
Grp X Sex X P. Abil	2	4.34*

*$p < .05$.
Note. Values enclosed in parentheses represent mean square errors.



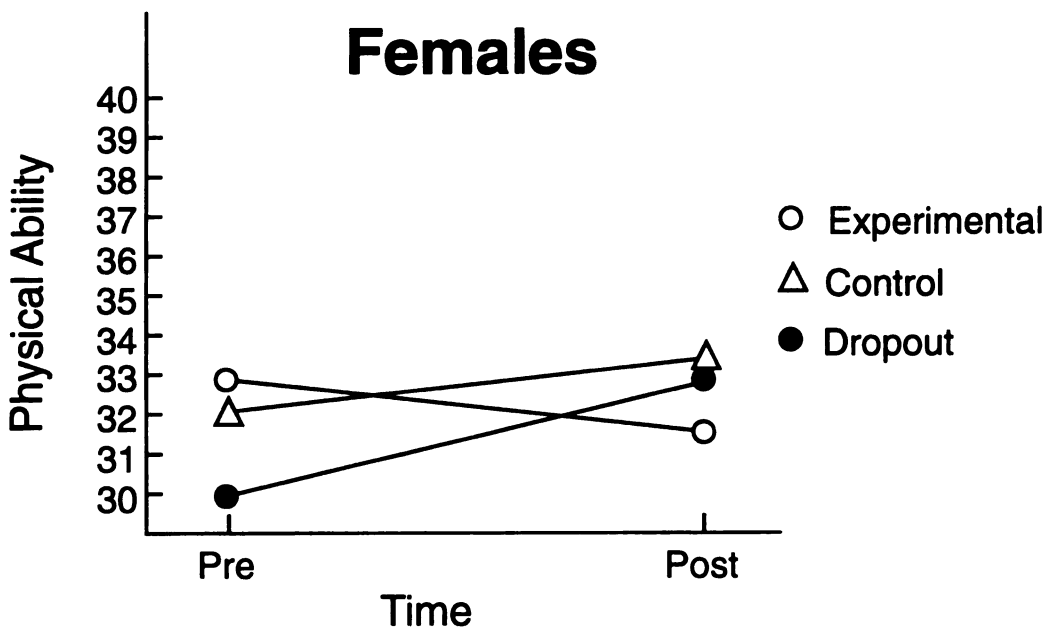


Figure 5
Self Concept of Physical Ability by Gender

Special education subjects also scored lower than did regular education students on perceptions of physical ability $F(1,45) = 4.98$, $p < .05$, a difference that was most pronounced among special ed students who did not continue the study. A comparison with regular education children can be seen in Table 14. They may already have doubts about their ability in the classroom and, given their history of academic failure, they may well have carried these doubts on to the playground as well. The self assessment of special ed students appears to be congruent with their actual Pacer performance. Dropouts, regardless of group, also scored lower than experimental or control subjects, but this difference did not reach significance.

There was a lack of an interaction between educational status and treatment on the self concept of physical ability, nor was there an increase in physical ability across all subjects. Previous research (Hilyer & Mitchell, 1979; McGowan, Jarman, & Pedersen, 1974), has shown running and other forms of aerobic activity to have a greater impact on the self concept of special education students, a finding that was not observed in the present study.

Table 14
Self Concept of Physical Ability by Educational Programming

	Pretest		Posttest	
Group	M	SD	M	SD
Experimental				
regular ed (16)	34.8	4.7	34.2	5.6
special ed (6)	34.0	4.7	34.3	5.7
Control				
regular ed (9)	35.2	3.3	34.9	4.1
special ed (2)	30.5	13.4	34.4	6.5
Dropouts				
regular ed (16)	33.1	4.2	34.7	3.2
special ed (2)	23.0	9.9	27.5	2.1

Analysis of Variance

Source	df	F
Between subjects		
Within Cells	45	(38.09)
Group	2	3.09
Spec Ed	1	4.98*
Grp X Spec Ed	2	2.32

*$p < .05$.
Note. Values enclosed in parentheses represent mean square errors.

Ethnic differences were also observed for the self concept of physical ability in conjunction with group status $F(2,58) = 4.63$, $p < .05$. Means for this factor and the analysis of variance can be found in Table 15. Among white students, those in the experimental and control groups showed no difference between pre and post testing in their rating of physical ability. White dropouts, however, showed a large increase after dropping out of the study.

No significant difference was observed among nonwhite experimental subjects while nonwhite dropouts decreased slightly in their self rating. However, nonwhite control subjects gained a significant amount (over four points) from pre to post testing. This was the biggest gain for any subgroup in the entire study. The effects of this interaction can be seen graphically in Figure 6.

Table 15
Self Concept of Physical Ability by Race

	Pretest		Posttest	
Group	M	SD	M	SD
Experimental				
white (11)	32.2	4.9	32.4	5.5
nonwhite (15)	35.1	4.8	34.6	5.2
Control				
white (10)	34.5	5.5	34.1	4.3
nonwhite (4)	28.3	9.5	32.8	5.0
Dropouts				
white (13)	30.7	4.8	33.4	4.0
nonwhite (11)	35.8	5.2	34.7	4.7

Analysis of Variance

Source	df	F
Within subjects		
Within Cells	58	(7.78)
Phys Abil	1	2.71
Grp X Phys Abil	2	1.26
Race X Phys Abil	1	.03
Grp X Race X P. Abil	2	4.63*

$p < .05$.
Note. Values enclosed in parentheses represent mean square errors.

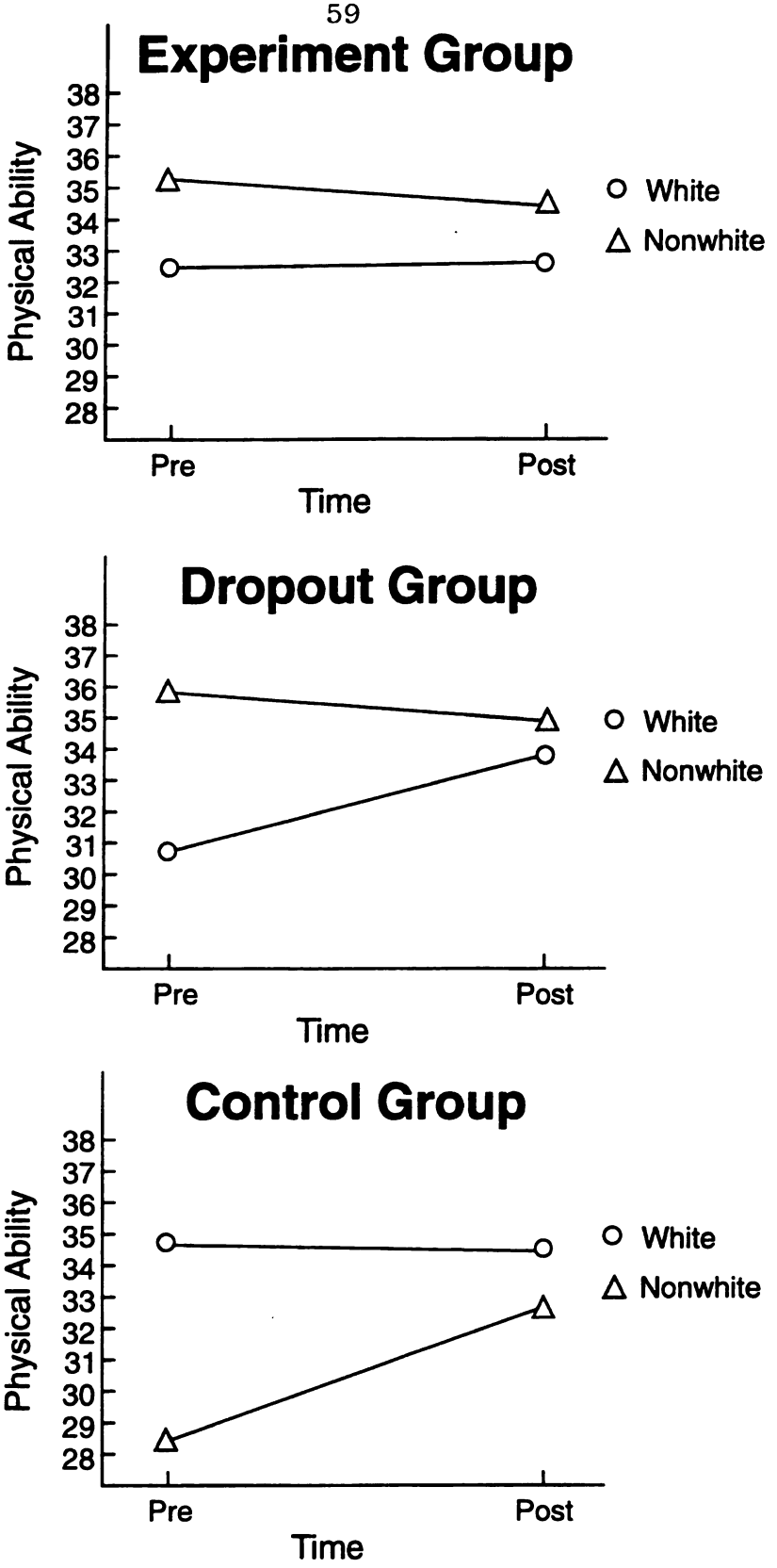


Figure 6
Self Concept of Physical Ability by Race

Total self concept

Compared to regular education students, special education students had lower total self concept scores, especially those among the dropout group. However, due to the small sample size any conclusions based upon this data are tenuous. Overall means and the statistical analysis can be seen in Table 16.

There were no interactions between this factor and group status nor did total self concept change as a result of the running program.

Table 16
Total Self Concept by Educational Programming

	Pretest		Posttest	
Group	M	SD	M	SD
Experimental				
regular ed (16)	33.1	4.5	32.8	4.5
special ed (6)	30.1	6.7	32.8	4.1
Control				
regular ed (9)	32.6	4.3	33.7	4.0
special ed (2)	29.6	5.0	33.7	6.6
Dropout				
regular ed (16)	31.0	4.3	32.0	3.5
special ed (2)	21.5	2.2	22.7	7.7

Analysis of Variance

Source	df	F
Between subjects		
Within Cells	45	(33.16)
Group	2	4.90*
Spec Ed	1	6.66*
Grp X Spec Ed	2	2.60

*$p < .05$.
Note. Values enclosed in parentheses represent mean square errors.

CHAPTER V

DISCUSSION AND CONCLUSIONS

Summary of Research Findings

The four experimental hypotheses were not supported by the data in this experiment. They will now be reviewed in greater detail starting with physical fitness measures. Children showed no increase their aerobic capacity as a result of participation in the Running Club. Succinctly stated, the effect of the independent variable (running) was insufficient to produce a significant change in aerobic capacity. Although the exact reasons for this are unknown, it is suspected that experimental subjects were unwilling or unable to train at an aerobic level for twenty minutes three afternoons per week.

As expected, there were a priori differences between experimental and control subjects on the PACER, likely due to a self selection factor, but not between experimental subjects and those who later dropped out of the study. It is intriguing why the control group showed the greatest amount of improvement on the PACER (3.0 shuttles vs. 1.9 for experimentals). One hypothesis is that the controls may have been more motivated than experimental subjects who had been running for the previous ten weeks and for whom the novelty

may have worn thin. They may have also been exercising during their extracurricular activities as Percy, Dziuban, and Martin (1981) suspected in their study.

Subjects did not show a significant increase in self concept of physical ability after participating in this study as there were no significant differences among groups at both points of assessment. This may have occurred because children did not have a tangible goal to master and giving them specific feedback about their running was difficult.

For the self concept of physical appearance, however, an interesting event occurred. Although there were no overall differences among the three groups on this factor, both experimental and control subjects improved significantly in comparison to their pretest levels. The control group actually showed the greatest raw score improvement on self concept of physical appearance and improved the most on the PACER as well. By participating in the Running Club, experimental subjects may have become more aware of their physical appearance and may have become sensitized to the fact they were not in their ideal condition. They may also have discovered that their appearance was not what they would have liked it to be. There was an interesting trend that showed that lack of participation in a formal running program actually improved the self concept of subjects in the control group, but recall they still received a small, aerobic benefit outside of the intervention.

The children showed the most enthusiasm when they raced each other around the school or ran with members of the research team. Subjects were encouraged to develop friendships and to run in small groups. Although it appeared subjects were interested in the social aspects of the Running Club, they did not improve their self concept of peer relations as a result of running after school for ten weeks. A similar finding was noted by McGowan, Jarman, and Pedersen (1974) in their study with seventh grade boys low in self esteem and peer approval.

Control subjects and dropouts actually outgained Running Club participants on the self concept of peer relations, although this difference did not reach significance. This finding could be due to the fact that running is actually a solitary activity, thus making it more difficult for experimental subjects to develop their peer relations skills. Additionally, requiring children to be in close proximity to one another and requiring them to follow group norms produced occasion conflict and fighting among experimental subjects.

Improvement in total self concept was not observed nor were there differences among experimentals, controls, and dropouts on this factor. This finding was not unexpected and lends support to the revised Marsh and Shavelson (1985) self concept model that is both multifaceted and hierarchical. It also suggests that changes in global aspects of self concept, as assessed in this study, do not often reach significant

levels. Research with adults, for example, has shown that exercise is likely to improve self concept only when self concept has been separated into its more specific components (Kaplan, Atkins, & Reinsch, 1984; Sonstroem, 1984).

Other than physical appearance, no other self concept factor showed improvement. In sum, the treatment had minimal impact on both aerobic capacity and most self concept factors. Most of the significant findings were interactions among demographic measures, not main effects for treatment conditions, or were a priori differences. Without changes in aerobic capacity, corresponding increases in self concept factors seem less likely to occur. Regardless, a few studies have shown significant changes in self concept without improved levels of fitness (Heaps, 1978; Leonardson, 1977) and the control group in this study did show a trend toward an increase in self concept. It may be the perception of physical fitness that is the key ingredient in self concept/exercise research rather than actual measured changes. Other research has shown that even with increases in physical fitness (Tuckman & Hinkle, 1986; Hinkle, Tuckman, & Sampson, 1993; Labbe & Welsh, 1993), changes in self concept were only specific to running self efficacy.

Relationship to Other Studies

Results of this study support the five extant studies that showed little or insignificant improvement in self

concept as a result of an aerobic intervention. Unlike research conducted in the late 1970's, (e.g., Bruya, 1977; Martinek, Cheffers, & Zaichkowsky, 1978; Mauser & Reynolds, 1978), a high degree of aerobic intensity was sought and a valid attempt was made to measure it.

Results of this research appear to support Hinkle's (1993) contention that running does not have an effect on the psychological functioning of "normal" children. Additionally, the relatively large number of special education students did not show significant improvement in self concept, either.

It may well be that a short term running program would have minimal impact on self concept regardless of the population. Those studies that did show improvement in self concept exhibited only time limited effects that generally lasted less than six months after the study (Labbe & Welsh, 1993). Studies may also show decreases in self concept. For example, Martinek, Cheffers, and Zaichkowsky (1978) observed a decline in self concept over the ten weeks of their study for children in grades, three, four, and five, a finding also noted by Tuckman and Hinkle (1986). Although declines were not evident in this study, the number of children from these same grades who may have experienced this developmental trend may help explain why increases in self concept were not observed.

Difficulties with the Study

There are many suspected reasons why increases in aerobic fitness were not found among participants in the Running Club. One possibility may be that ten weeks may not have been long enough to produce a change in aerobic capacity with young children. Previous research (Simons, McGowan, Epstein, & Kupfer, 1985) has shown that eight to ten weeks is the minimum duration necessary, although it is important to note that these studies were conducted with older children.

Another possibility may be related to the fact that some sessions had to be cancelled because of bad weather. Additionally, a large portion of students did not train all three nights each week because of other after-school commitments. The research team was faced with the dilemma of allowing some students to attend "part time" or dropping them from the Running Club and left to find their own physical activity. We chose to include these students unless they were habitually absent, were behavioral problems, or dropped out on their own accord. Because flexibility is necessary to increase exercise compliance (Doan & Scherman, 1987), a strong effort was made to minimize the number of dropouts by being as accommodating as possible. Another step we took was to put a minimal emphasis on winning and competition, which typically adds to the drop out rate.

Another practical concern for the research team was the

issue of adequately supervising the number of participants during all phases of the study. For example, because this was a field study conducted on school property without a track, it was difficult to monitor students' activity when they were in "blind spots" behind the school.

Running for the children was probably difficult, and not a "fun" activity. Research has shown adherence to exercise programs among adults is quite limited beyond a couple of months (Dishman, 1988). Why should we expect children to be more disciplined? For many of our subjects, it was their first time running, and they may have underestimated how difficult an activity it was going to be. The large number who dropped out may have needed more reinforcement than nightly snacks or the opportunity of running in two or three weekend races and receiving a t-shirt. Most experimental subjects enjoyed the races and the excitement but found it difficult to run the entire 3.1 miles (5 km).

The Dropout Problem

The large number of dropouts in the study was unexpected. It certainly was not anticipated that the number of dropouts would exceed the size of the control group and almost equal the size of the experimental group. This occurred even though subjects volunteered to participate in the Running Club and the program was well received and previously established at the elementary school. It is difficult to determine exactly why so many students dropped out of the study, but their large

numbers attest to the difficulty retaining elementary-age children in a formal running program. It may also reflect their unrealistic expectations about running as a fun and easy sport. Running by itself is natural for most children, but commitment to a formal running program has to be developed. For any future research with children in this 7 - 11 age group to be successful, it will be necessary to keep the number of dropouts to a minimum. Not surprisingly, those who dropped out had the lowest rating of self concept of physical appearance.

Limitations and Assumptions of the Study

This study assumed that children gave their best effort on the PACER and had adequate experience running it. Practice trials helped to prepare subjects to do the timed running, but it is doubtful whether children pushed themselves to obtain maximal results. Some appeared to drop out long before they were truly winded. It was also important which group of children were running together because subjects appeared to perform at the level of their competition. As a control measure, the trials were segregated by gender whenever possible.

On the SDQI, it was assumed children were truthful in their reflections and did not give socially desirable responses or purposefully try to make themselves or the researchers look good or bad. Anonymity, internal controls,

and an understanding of the purposes of testing should have reduced social desirability bias. The SDQI may not have been sensitive enough to detect changes in self concept, but it is one of the most multifaceted and researched self concept scales available. A ceiling effect or restriction of range may have occurred, which would limit gains upon posttesting, although the data generally does not support this. Obtaining valid results is a difficulty inherent in any self report measure particularly when one examines self concept.

Most children in this sample tended to be positively biased when reporting their self concept, and informal observations confirmed this. For example, the number of laps students reported each night was often physically impossible given the time they were on the playground. As one staff member described it, these children have to live in a fantasy world just to survive. Focusing on all the negatives many of these children confront on a daily basis: poverty, broken homes, drugs, crime, and other maladies, are just some of the challenges that face urban youth.

Several assumptions were made with respect to the data. Using a MANOVA to analyze the results, it was assumed the population from which the data was drawn was normally distributed and the error terms were identically and independently distributed. A pooled standard deviation was used for the three groups, which assumed homogeneity of variance.

An explanation why changes in self concept were not evident in this study may be related to the possibility that the self concepts of 8 to 11 year olds are not as differentiated as the Marsh/Shavelson (1985) model proposes. Elementary age children may not be able to see themselves as good in one area and not quite so good in another. At this age, their thinking is more concrete and less differentiated (Piaget, 1952) and there may not yet be fine distinctions in their more global sense of self.

Based on our experience, even if the study would have been lengthened beyond ten weeks, it is doubtful whether the students would have had the motivation and determination to train at an aerobic level. Running is difficult, and many of the students held misperceptions regarding how much fun it would be. During most sessions, the subjects did not appear to push themselves and took a break after running only two or three laps around the school. Once children ran a few laps, it was even harder to get them to continue running; many of them walked. This occurred even though we taught children how to take their pulse and emphasized the need to train in a therapeutic range. A chart published by the American Heart Association showing age and training zones was posted in the gymnasium to emphasize this point.

The bottom line is that it is very difficult to do field research of this nature with elementary youngsters. No matter which kind of research paradigm is used, our experiences

suggest that more adults are needed to supervise children this age to keep them on task.

Suggestions for Future Research

To advance research in this area, stronger experimental designs are needed with larger sample sizes and random assignment to treatment conditions. As with any research endeavor, strong efforts need to be made to keep dropouts to a minimum. In addition, studies on exercise and psychological variables should be extended beyond ten weeks. Conducting field research within a school setting is usually difficult because student and administrative cooperation is not always axiomatic. Future researchers should address these potential obstacles and may want to assess children for longer time periods in order to examine longitudinal and developmental effects of exercise.

Research should also focus on students with special education placements as they produced some of the lowest self concept scores in this study. Conversely, it would have been illuminating to take a group of elite runners and analyze the impact such an intervention would have upon them. All subjects did not respond to the treatment in the same manner, and there were some excellent runners among this group. Some of them received trophies at local road races. The next study in this genre should find a way to motivate children to run, verify that a training effect has been achieved, and then

measure psychological factors in addition to self concept. Two examples that quickly come to mind are depression and anxiety.

It would also be helpful to provide more frequent, tangible reinforcement such as food or juice and have enough staff to accurately monitor the training activities of the participants. We made an informal attempt to record progress by having children report their own laps, but there was no way of knowing for sure whether their reports were accurate.

There are several changes in methodology that would improve field studies and help shed more light on the relationship between aerobic activity and self concept development in children. As mentioned previously, one way to increase fitness would be to extend the study beyond ten weeks. The best time to conduct a similar study would be in the fall when the weather is more favorable to outdoor activities. Because the weather is too unpredictable for consistent outdoor activities, having facilities for indoor running would be desirable, something that was not available for the research reported here.

As an alternative to extending the length of running programs, an option would be to lengthen the program to a full hour each night instead of 45 minutes. Much of the club time was taken up waiting for subjects to arrive in the gym from class or other after school activities, taking roll, and doing stretching exercises. Announcements and a cool down period

at the end of the workout, although essential, cut into the exercise period. In all, children were on the playground for about half an hour each night with about twenty minutes devoted to actual running.

However, because of the age of the children, a longer nightly session may exceed their interest level and actually decrease their motivation and enjoyment for running. It may also have the untoward effect of producing more behavior problems, more dropouts, and possibly more injuries.

Regardless of how the study was extended, the children would still have to train at a sufficient intensity to achieve an aerobic benefit. This level is approximately 70-85% of maximum heart rate and has to be performed for at least twenty minutes, three to four times per week (American College of Sports Medicine, 1978; Cooper, 1978; Martin & Dubbert, 1987). The researchers in this study found that this objective was very difficult to obtain.

A positive feature of research of this nature is that it was a field study conducted in a typical urban, elementary school setting under natural conditions. This factor promotes external validity and encourages replication under different conditions. A playground is something most schools possess and instruments like the PACER and the SDQI are inexpensively and easily administered. These items may lack the sophistication of a treadmill, heart monitoring, or body composition testing, but they are generally accurate in their

results. Children need little equipment to run beside a good pair of track shoes, shorts, and a t-shirt. Although this study did not find an immediate increase in self concept as a result of children's participation in a running program, replications of this kind of research, with modifications, are well within the domain of investigators seeking to extend our knowledge in this area.

Summary and Conclusions

After undergoing ten weeks of an after school running program, experimental subjects comprised of children 7 to 11 year olds did not increase their level of aerobic capacity beyond pretest levels. There were significant differences on PACER performance between experimental and control subjects, but these differences existed at baseline and were likely attributable to a self selection factor.

Likewise, changes were not observed in the self concept factors of physical ability and peer relations. However, physical appearance ratings did increase as a result of the intervention, although the control group also showed improvement on this factor. According to the Marsh and Shavelson (1985) hierarchical model of self concept, factors most sensitive to the intervention and lower in the hierarchy (i.e., physical ability, physical appearance) should be the more amenable to change. Conversely, self concept factors more superior in the hierarchy such as total self concept or

nonacademic/academic self concept would less likely be altered as a result of a specific intervention. This belief was supported as total self concept did not show any increase among subjects.

Regular education students scored higher than special education students on the PACER at both pre and post testing, but there was no interaction between educational programming and treatment condition for this variable. Special education students also rated themselves significantly lower on physical ability, a finding that was congruent with their actual PACER performance. Nonwhite subjects produced higher scores on the PACER, but this difference was also observed at pretesting. Minorities also rated themselves higher on the self concept of physical ability.

Two interactions occurred in the analysis for the self concept of physical ability and physical appearance. These were related to treatment condition, gender, and race. For physical ability, female dropouts gained a significant amount over pretest levels while male dropouts lost ground upon posttesting. For physical appearance, nonwhite control subjects showed a significant increase in their ratings while white control subjects were unchanged in their ratings from pretest to posttest. For some subgroups, lack of participation in the program appeared to have beneficial effects. This may have occurred because their self concepts remained unchallenged because they had nothing to compare

themselves with and did not receive any feedback.

One could hypothesize that young children are quite impressionable and that interventions at this age would likely be effective. This may be true in some sorts, but modifications in self concept take time and are not always linear. Changes may be based more on highly salient events during one's formative years such as repeated school failure, early childhood trauma, parenting practices, and chronic medical conditions rather than on small, short term interventions. It could be that children have to run consistently for at least three or more months before an increase in self concept becomes apparent, an idea that awaits further exploration.

The Running Club was only one small study in an area where few studies exist. Many more are needed before we can know with great certainty how and whether aerobic activity affects children's self concepts.

APPENDIX A

CONSENT FORMS

Dear Parent: 4/15/94

I am a graduate student at Michigan State University and will be conducting a study at Bingham Elementary School. This year in conjunction with the Running Club, I will be collecting data regarding self concept and physical fitness. As you may know, your child will be running three nights a week (Tuesdays, Wednesdays, and Thursdays) from 3:00 to 3:50 pm. The length of the program is ten weeks.

As part of my study, your child will complete a self concept inventory and a test of aerobic capacity both before and after participation in the Running Club. Testing and physical fitness assessment should take between two to three hours in addition to the after school program.

Your son or daughter's participation is strictly voluntary and he/she may drop out of the study or elect not to participate in certain procedures at any time without penalty. Your child may participate in the Running Club without taking part in this study. The results of this research will be held in strict confidence with only this researcher knowledgeable of individual responses. It may be necessary for me to have access to school files in order to obtain basic demographic information such as phone numbers and date of births. When results are presented, it will be in such a way that individual students cannot be identified. Upon request, results will be made available to you and your child.

It is anticipated participants will become more physically fit and feel better about themselves as a result of this study, however I cannot guarantee this will happen. If you have any questions or concerns about this study, I can be reached at 332-4158 or through the office at Bingham School at 325-6770. You indicate your voluntary agreement for your child's participation by completing and returning this form.

Signed_____ Date_____

Child's Name_____

Thank you for your cooperation with this study.
Sincerely,

Laska Lewis
Running Club Supervisor

Jeffrey S. Sonnega
Michigan State University graduate student

Dear Parent: 4/15/94

I am a graduate student at Michigan State University and will be conducting a study at Bingham Elementary School. Your son or daughter has been selected to participate in a control group to children in Laska Lewis's after school Running Club. I am asking your assistance in allowing your child to complete a paper and pencil measure of self concept and to participate in a field test of physical fitness. Your child will be measured twice with these instruments; once in April and again in June. Total testing time to complete these instruments is approximately one to two hours. Data form studies like this have potential benefit for all children by providing educators with a better understanding on the relationship between aerobic capacity and self concept development.

Your son or daughter's participation is strictly voluntary and he/she may drop out of the study or elect not to participate in certain procedures at any time without penalty. Your child may participate in the Running Club without taking part in this study. The results of this research will be held in strict confidence with only this researcher knowledgeable of individual responses. It may be necessary for me to have access to school files in order to obtain basic demographic information such as phone numbers and date of births. When results are presented, it will be in such a way that individual students cannot be identified. Upon request, results will be made available to you and your child.

If you have any questions or concerns about this study, I can be reached at 332-4158 or through the office at Bingham School at 325-6770. You indicate your voluntary agreement for your child's participation by completing and returning this form.

Signed_____ Date_____

Child's Name_____

Thank you for your cooperation with this study.
Sincerely,

Laska Lewis
Running Club Supervisor

Jeffrey S. Sonnega
Michigan State University graduate student

APPENDIX B

INTRODUCTORY LETTER AND PROGRAM RULES

LANSING
SCHOOL
DISTRICT
Committed to Quality

PERMISSION FOR PARTICIPATION IN THE

BINGHAM SCHOOL RUNNING CLUB

I give my permission for my child _____ to participate in this year's Bingham School Running Club. I understand they will meet each Tuesday, Wednesday and Thursday after school from 3:00-3:50 pm. I understand it is my responsibility to provide safe transfer home, either by walking, riding, etc....

Signed_____ Date_____
Phone_____

_____ I would be willing to help during the year.

RETURN SIGNED BY TUESDAY, APRIL 5, 1994.

Bingham Elementary School
121 Bingham Street
Lansing, Michigan 48912

LANSING
SCHOOL
DISTRICT
Committed to Quality

March 1994

BINGHAM SCHOOL RUNNING CLUB

Dear Parents,

Your child has shown some interest in participation in our Bingham School Running Club this year. As you may or may not be aware, several years ago the club was started, with approximately 60 students from grades 3-5. We were running 3 days per week either before breakfast or before lunch. When we needed more time for running, we moved the program to after school hours (3:00-3:50pm).

During the 3 month period, a number of students ran in several area races and thoroughly enjoyed and benefitted from the experience. The 'icing on the cake' came in June, however, when we had 30 students run in the Michigan Run, held in downtown Lansing.

Running is a difficult sport that takes much commitment, determination, and courage. Your child will most definitely benefit from involvement because it will strengthen these character building areas, and she/he will become physically fit and healthier at the same time.

This year's club will begin running April 6. We will run 3 days per week, after school from 3:00- 3:50. The days will be Tuesdays, Wednesdays, and Thursdays.

There is little cost involved in participation in this club. When we chose area races to participate in, there will be a reduced entry fee. You may chose to have your child run if it's convenient both monetarily & timewise. We have many generous sponsors in the business community so please don't be intimidated by a cost factor.

Bingham Elementary School
121 Bingham Street
Lansing, Michigan 48912

LANSING
SCHOOL
DISTRICT
Committed to Quality

If you would like your child to participate in this club, please read and discuss this information and the Rules and Guidelines with your child. Return the signed permission slip no later than Tuesday, April 5. Your child cannot participate without your written permission.

You will also find attached, another permission slip for your child's participation in a research project, from MSU on running club. This should be a neat experience to see if, in fact involvement increases self-esteem and physical fitness. Please sign for permission and call if you have any questions. (325-6770) Thank you.

Sincerely,
Laska Lewis
Laska Lewis
Running Club Supervisor

RULES AND GUIDELINES
FOR BINGHAM RUNNING CLUB

1. Either running or tennis type shoes must be worn while running.

2. All absences must have a written excuse from parents or caregivers.

3. After 2 unexcused absences, the student will be dismissed from the club.

4. Student's must continue to behave appropriately in their classrooms and keep their school work up to their teacher's satisfaction. If these two classroom standards are not kept up, student will be dismissed from the club!

NOTE: If it's raining, we will cancel Runner's Club unless it is just sprinkling and warm. Please be advised of this so that your child can be sure of what to do on rain days.

Bingham Elementary School
121 Bingham Street
Lansing, Michigan 48912

APPENDIX C

DEMOGRAPHIC DATA SHEET

DEMOGRAPHIC DATA SHEET

Student's Name _____

Address _____
(street)

phone # _____

date of birth _____

age _____

grade _____

sex _____

ethnicity (___ Asian, ___ Black, ___ Hispanic, ___ White, (optional) ___ Other)

APPENDIX D

PROGRESSIVE AEROBIC CARDIOVASCULAR ENDURANCE RUN (PACER)

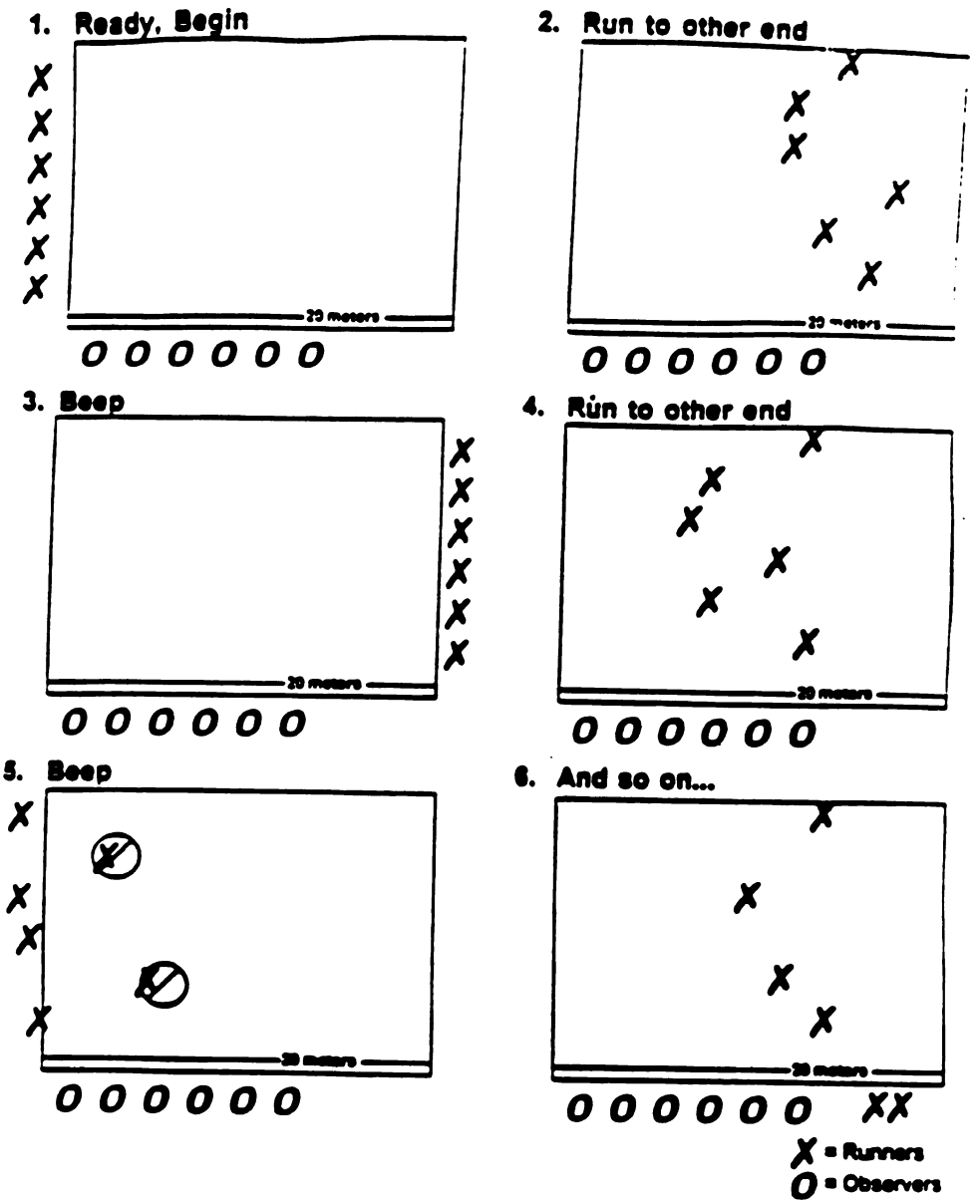


Figure 1. Schematic diagram of PACER Test.

APPENDIX E

Self Description Questionnaire I (SDQI)

SELF DESCRIPTION QUESTIONNAIRE

Name.....Boy.....Girl.....Grade/Year.....

Age.....School.....Teacher.....

This is a chance to look at yourself. It is not a test. There are no right answers and everyone will have different answers. Be sure that your answers show how you feel about yourself. PLEASE DO NOT TALK ABOUT YOUR ANSWERS WITH ANYONE ELSE. We will keep your answers private and not show them to anyone.

When you are ready to begin, please read each sentence and decide your answer. (You may read quietly to yourself as I read aloud.) There are five possible answers for each question -- "True", "False", and three answers in between. There are five boxes next to each sentence, one for each of the answers. The answers are written at the top of the boxes. Choose your answer to a sentence and put a tick (✓) in the box under the answer you choose. DO NOT say your answer out loud or talk about it with anyone else.

Before you start there are three examples below. Somebody named Bob has already answered two of these sentences to show you how to do it. In the third one you must choose your own answer and put in your own tick (✓).

		FALSE	MOSTLY FALSE	SOMETIMES FALSE, SOMETIMES TRUE	MOSTLY TRUE	TRUE	
EXAMPLES							
1. I like to read comic books.....	1	☐	☐	☐	☐	☑	1
2. In general, I am neat and tidy.....	2	☐	☐	☑	☐	☐	2
3. I like to watch T.V.	3	☐	☐	☐	☐	☐	3

(Bob put a tick in the box under the answer "TRUE". This means that he really likes to read comic books. If Bob did not like to read comic books very much, he would have answered "FALSE" or "MOSTLY FALSE".)

(Bob answered "SOMETIMES FALSE, SOMETIMES TRUE" because he is not very neat, but he is not very messy either.)

(For this sentence you have to choose the answer that is best for you. First you must decide if the sentence is "TRUE" or "FALSE" or somewhere in between. If you really like to watch T.V. a lot you would answer "TRUE" by putting a tick in the last box. If you hate watching T.V. you would answer "FALSE" by putting a tick in the first box. If your answer is somewhere in between then you would choose one of the other three boxes.)

If you want to change an answer you have marked you should cross out the tick and put a new tick in another box on the same line. For all the sentences be sure that your tick is on the same line as the sentence you are answering. You should have one answer and only one answer for each sentence. Do not leave out any of the sentences.

If you have any questions put up your hand. Turn over the page and begin. Once you have started, PLEASE DO NOT TALK.

		FALSE	MOSTLY FALSE	SOME-TIMES FALSE, SOME-TIMES TRUE	MOSTLY TRUE	TRUE	
1. I am good looking	1	☐	☐	☐	☐	☐	1
2. I'm good at all **SCHOOL SUBJECTS**	2	☐	☐	☐	☐	☐	2
3. I can run fast	3	☐	☐	☐	☐	☐	3
4. I get good marks in **READING**	4	☐	☐	☐	☐	☐	4
5. My parents understand me	5	☐	☐	☐	☐	☐	5
6. I hate **MATHEMATICS**	6	☐	☐	☐	☐	☐	6
7. I have lots of friends	7	☐	☐	☐	☐	☐	7
8. I like the way I look	8	☐	☐	☐	☐	☐	8
9. I enjoy doing work in all **SCHOOL SUBJECTS**	9	☐	☐	☐	☐	☐	9
10. I like to run and play hard	10	☐	☐	☐	☐	☐	10
11. I like **READING**	11	☐	☐	☐	☐	☐	11
12. My parents are usually unhappy or disappointed with what I do	12	☐	☐	☐	☐	☐	12
13. Work in **MATHEMATICS** is easy for me	13	☐	☐	☐	☐	☐	13
14. I make friends easily	14	☐	☐	☐	☐	☐	14
15. I have a pleasant looking face	15	☐	☐	☐	☐	☐	15
16. I get good marks in all **SCHOOL SUBJECTS**	16	☐	☐	☐	☐	☐	16
17. I hate sports and games	17	☐	☐	☐	☐	☐	17
18. I'm good at **READING**	18	☐	☐	☐	☐	☐	18
19. I like my parents	19	☐	☐	☐	☐	☐	19
20. I look forward to **MATHEMATICS**	20	☐	☐	☐	☐	☐	20
21. Most kids have more friends than I do	21	☐	☐	☐	☐	☐	21
22. I am a nice looking person	22	☐	☐	☐	☐	☐	22
23. I hate all **SCHOOL SUBJECTS**	23	☐	☐	☐	☐	☐	23
24. I enjoy sports and games	24	☐	☐	☐	☐	☐	24
25. I am interested in **READING**	25	☐	☐	☐	☐	☐	25
26. My parents like me	26	☐	☐	☐	☐	☐	26

		FALSE	MOSTLY FALSE	SOME-TIMES FALSE, SOME-TIMES TRUE	MOSTLY TRUE	TRUE	
27. I get good marks in **MATHEMATICS**	27	☐	☐	☐	☐	☐	27
28. I get along with other kids easily	28	☐	☐	☐	☐	☐	28
29. I do lots of important things	29	☐	☐	☐	☐	☐	29
30. I am ugly	30	☐	☐	☐	☐	☐	30
31. I learn things quickly in all **SCHOOL SUBJECTS** .	31	☐	☐	☐	☐	☐	31
32. I have good muscles	32	☐	☐	☐	☐	☐	32
33. I am dumb at **READING**	33	☐	☐	☐	☐	☐	33
34. If I have children of my own I want to bring them up like my parents raised me	34	☐	☐	☐	☐	☐	34
35. I am interested in **MATHEMATICS**	35	☐	☐	☐	☐	☐	35
36. I am easy to like	36	☐	☐	☐	☐	☐	36
37. Overall I am no good	37	☐	☐	☐	☐	☐	37
38. Other kids think I am good looking	38	☐	☐	☐	☐	☐	38
39. I am interested in all **SCHOOL SUBJECTS**	39	☐	☐	☐	☐	☐	39
40. I am good at sports	40	☐	☐	☐	☐	☐	40
41. I enjoy doing work in **READING**	41	☐	☐	☐	☐	☐	41
42. My parents and I spend a lot of time together	42	☐	☐	☐	☐	☐	42
43. I learn things quickly in **MATHEMATICS**	43	☐	☐	☐	☐	☐	43
44. Other kids want me to be their friend	44	☐	☐	☐	☐	☐	44
45. In general I like being the way I am	45	☐	☐	☐	☐	☐	45
46. I have a good looking body	46	☐	☐	☐	☐	☐	46
47. I am dumb in all **SCHOOL SUBJECTS**	47	☐	☐	☐	☐	☐	47
48. I can run a long way without stopping	48	☐	☐	☐	☐	☐	48
49. Work in **READING** is easy for me	49	☐	☐	☐	☐	☐	49
50. My parents are easy to talk to	50	☐	☐	☐	☐	☐	50
51. I like **MATHEMATICS**	51	☐	☐	☐	☐	☐	51
52. I have more friends than most other kids	52	☐	☐	☐	☐	☐	52

		FALSE	MOSTLY FALSE	SOME-TIMES FALSE, SOME-TIMES TRUE	MOSTLY TRUE	TRUE	
53.	Overall I have a lot to be proud of	53					53
54.	I'm better looking than most of my friends	54					54
55.	I look forward to all **SCHOOL SUBJECTS**	55					55
56.	I am a good athlete	56					56
57.	I look forward to **READING**	57					57
58.	I get along well with my parents	58					58
59.	I'm good at **MATHEMATICS**	59					59
60.	I am popular with kids of my own age	60					60
61.	I can't do anything right	61					61
62.	I have nice features like nose, and eyes, and hair	62					62
63.	Work in all **SCHOOL SUBJECTS** is easy for me	63					63
64.	I'm good at throwing a ball	64					64
65.	I hate **READING**	65					65
66.	My parents and I have a lot of fun together	66					66
67.	I can do things as well as most other people	67					67
68.	I enjoy doing work in **MATHEMATICS**	68					68
69.	Most other kids like me	69					69
70.	Other people think I am a good person	70					70
71.	I like all **SCHOOL SUBJECTS**	71					71
72.	A lot of things about me are good	72					72
73.	I learn things quickly in **READING**	73					73
74.	I'm as good as most other people	74					74
75.	I am dumb at **MATHEMATICS**	75					75
76.	When I do something, I do it well	76					76

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