

A STUDY OF PHYSICAL EDUCATION PARTICIPATION
AND PHYSICAL FITNESS DEVELOPMENT
IN TRAINABLE AND EDUCABLE MENTALLY RETARDED CHILDREN

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Raymond Wondergen, Jr.
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Candidate: Raymond Wondergen, Jr.

We recommend acceptance of this thesis to the Graduate College in partial fulfillment of this candidate's requirements for the degree Master of Science.

Samuel K. Goodwin
Thesis Committee Member

May 2, 1972
Date

Wm. D. V. Pitt
Thesis Committee Member

May 2, 1972
Date

Harold D. Hulbert
Thesis Committee Member

May 2, 1972
Date

This thesis is approved for the Graduate College:

James W. Erickson
Dean, Graduate College

May 8, 1972
Date

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ABSTRACT

The problem in this study was to evaluate the frequency of physical education participation on the muscle fitness and organic fitness level of trainable and educable mentally retarded children. Subproblems included a more specific study of: (1) physical education programs taught by certified physical educators and/or student teachers, (2) an integrated physical education program, and (3) a special education school with no formal physical education instruction.

The one-group pretest-posttest research design method was used for gathering data. Subjects, from special education schools at Elk Creek and Squaw Creek, Wisconsin, and from special education classes in the La Crosse, Wisconsin Public School District, were pre- and posttested with the "Fait Physical Fitness Test for the Mentally Retarded". A 27 week time duration elapsed between pretest and posttest. The researcher had no influence on the subject's physical education programs.

The data collected were statistically treated with the Student's t test for measurement of within group differences. No significant differences were found in any group in muscle fitness or organic fitness.

CHAPTER I

INTRODUCTION

A awareness has occurred in recent years of meeting the educational needs of the handicapped. Through the financial support at the federal and state levels, school districts have been able to initiate new and/or expanded special education programs within their districts. To what extent the mentally retarded are benefiting from courses in physical education, if they are participating in such courses, is undetermined at the present. (46:5)

"While many of the sciences and professions have begun to take action in the area of mental retardation, little has been done to provide the retarded with vital recreational and physical education programs." (41) Proponents of physical education adhere to the tenet that physical education is for all students; therefore, the mentally retarded cannot be excluded from physical education.

Lack of interest in adaptive physical education has resulted in minimal concern for the physical fitness level of the trainable and educable mentally retarded. (17:780-1) Are these children always to be forgotten? Is their well-being, which could be enhanced in a physical fitness program, not as important as the intellectually normal child? What is the general fitness level of trainable and educable mentally retarded children? To help answer these questions this study was conducted.

Statement of the Problem

The problem will be to evaluate the effect of the frequency of physical education participation on the physical fitness level of trainable and educable mentally retarded children.

Statement of Subproblems

- A. To determine the effects on the level of physical fitness of trainable mentally retarded children who are participating in a physical education program conducted by a professional physical educator, with the assistance of a student teacher.
- B. To determine the effects on the level of physical fitness of a trainable mentally retarded physical education program conducted by a student teacher.
- C. To determine the effects of an integrated physical education program on the level of physical fitness of educable mentally retarded children.
- D. To determine the effects on the level of physical fitness of a mixed trainable and educable mentally retarded physical education program conducted by a physical educator.
- E. To determine the effects of no physical education participation on the physical fitness level of trainable and educable mentally retarded children.

Need for the Study

The sedentary life of the average American has shown there is a need to place an emphasis on physical fitness. (26) With normal children, as well as with those children in special education classes, daily physical education participation is a means of attaining a high level of physical fitness. Often special education children do not receive daily physical education or the quality of the program is low. Therefore, a study in this area was necessary.

Definition of Terms

Mentally Retarded. The American Association on Mental Deficiency defines mental retardation as

.....subaverage general intellectual functioning which originates during the developmental period and is associated with impairment in adaptive behavior. (1:251)

Educable Mentally Retarded. Mild and borderline groups of retarded children who can achieve at approximately $1/2$ to $3/4$ the rate of average pupils and who have a potential for independent social and vocational functioning at the adult level. Measured intelligence generally ranges from 55-85 I.Q. (9)

Trainable Mentally Retarded. Moderate and (upper) severe groups of retarded children who can achieve at approximately $1/3$ to $1/2$ the rate of average pupils and who have a potential for semi-dependent social and vocational

functioning at the adult level. Measured intelligence generally ranges from 30-55 I.Q. (9)

Fait Physical Fitness Tests for the Mentally Retarded.

This test was developed at the University of Connecticut by Dr. Hollis Fait, financed by a grant from the Joseph P. Kennedy, Jr. Foundation. (2:69)

Special Education School. A school for trainable and educable mentally retarded children.

Integrated School. A school for trainable, educable, and normal children.

Integrated Physical Education Class. A mixed physical education class of educable mentally retarded and normal children of the same age group.

Normal Children. Children who do not qualify for special education programs.

Special Education. Educational programs designed to meet the needs of trainable and educable mentally retarded children.

Muscular Fitness. The strength or force which can be produced by specific muscle groups. (7)

Muscular Endurance. Ability of muscles to work hard for prolonged periods of time. (7)

Organic Fitness. The efficiency and capacity for performing endurance tasks which involve many groups of muscles at the same time. Performance on such tasks is not

determined primarily by qualities of the muscles themselves but by the ability of the lungs, heart, and circulatory system to supply them with food and oxygen and to remove the waste products when this food is burned. (7)

Physical Fitness. The ability of the body to perform its work as efficiently as possible. (1:60)

Adapted Physical Education. Physical education which is modified to meet the needs of the handicapped. (2:60)

Delimitations

- A. Subjects were restricted to the trainable and educable mentally retarded children between the chronological ages of nine and twenty and enrolled in special education schools in Elk Creek and Squaw Creek, Wisconsin and in integrated schools in La Crosse, Wisconsin.
- B. The study consisted of five groups totaling thirty-eight subjects. Size varied from five to twelve members per group. (Table 1 and Appendix B)
- C. Due to physical handicaps a few subjects were not able to participate in the running events of the fitness test.
- D. Physical education students with prior teaching and counseling experience of trainable and educable mentally retarded children assisted in administering the fitness test.

- E. The researcher had no control over the outside of school activities of the subjects.
- F. Physical education programs studied were those which offered physical education classes daily, once-a-week, or not at all.

Limitations

The majority of the testing was conducted outside. Due to the variety of the quality of school ground turf the footing was not constant for the 25 and 300 yard run.

Hypotheses

The hypotheses tested in this study were:

- A. Trainable and educable mentally retarded children with once a week and no formal physical education will show no significant gain in muscle fitness and organic fitness in the duration of time between pretest and posttest.
- B. Trainable and educable mentally retarded children participating in a daily program of physical education will show significant gain in physical fitness in the duration of time between pretest and posttest.

Research Design

The one-group pretest-posttest research design method was used for gathering data.

Treatment of Data

Statistical tests were used to determine the changes, if any, within the groups from pretest to posttest.

CHAPTER II

REVIEW OF RELATED LITERATURE

The need for programs of physical education and fitness for the mentally retarded is emphasized in the literature. Forgetting the mentally retarded and their need for fitness and movement in education is commonplace. (17) Hayden (7) has stated "...mentally retarded children on the average have only half the strength of non-retarded children; fatigue sets in 30 percent faster and they carry more fat around."

How long will the mentally retarded be deprived of opportunities to develop physically? Is deprivation of physical education for the mentally retarded justified by physical educators? What holds back the mentally retarded's participation in physical education? In conscientious programs of physical education the mentally retarded child will improve physical fitness and motor ability. (13:61) Patience and understanding are the keys to teaching physical education to the retarded. The ability of the mentally retarded to engage in play and physical education must not be pre-judged. Mentally retarded are not innovative; they must be taught to play. (14) As Klausmeier (25) stated, the ability to engage in abstract thinking holds back the retarded but not their lack of physical development.

Stein (35:27) cited studies that show that the difference in motor performance between normal and mentally retarded children is due to lack of intellectual ability and not motor and physical ability.

The literature reviewed in this chapter has been presented in three sections. The first section contains general observations and studies as they pertain to the areas of motor and physical fitness development in physical education for the mentally retarded. The second and third sections concern physical education and physical fitness in the specific areas of educable and trainable mental retardation.

General Research on Physical Education
for the Mentally Retarded

Studies and findings appear in the literature which are applicable to the trainable and educable areas of mental retardation.

Attention has been focused by physical educators on I.Q. level and achievement in the learning of muscular skills. Kulcinski (27) conducted a study to determine whether I.Q. level was a factor in fifth and sixth grade boys and girls in learning fundamental muscular skills. A total of 105 subjects with intelligence quotients ranging from 123 to 45 for the boys and from 125 to 41 for the girls were studied. Skills presented were the same for all

subjects. A positive relationship was found between the intelligence quotient for each subject and the amount of skill learning which occurred.

In another comparison study conducted by Brace (41), the physical fitness level of mentally retarded boys was found to be definitely lower than normal boys of the same chronological age. Brace concluded that mentally retarded boys could profit from more vigorous activity. Similarly Nasatir (2) stated that an emphasis in the area of cardiovascular and muscular development is needed for those who require adaptive physical education.

In the area of motor educability Flora (43) conducted a study using trainable, educable, and normal ten and eleven year old boys. A significant difference was found in motor educability between the normals and the trainables and the normals and the educables; however, the trainables and educables did not differ significantly. Flora recommended that the trainables and educables be excluded from participating in the regular physical education class with normal children. This thinking is in opposition to other physical educators who feel that the educables and the normals should be integrated. (17)

Stein (40) felt strongly that the mentally retarded can be assets to society. He has cited studies where daily physical education and fitness programs have brought

about significant gains in intellectual development of the mentally retarded. (40:25) Like normal boys and girls the mentally retarded respond and progress when given specialized training in a progressive physical education program.

According to Stein (35:27), movement education is vital as it serves as an aid for expression which is often a difficult area for the mentally retarded. Brain injured children also benefit as movement education helps regain lost sensory perceptions. Use of leisure time can be of a constructive nature from the knowledge gained in a physical education and fitness program.

In a survey conducted by Brace (17) on adapted physical education programs in public schools, depriving the handicapped of movement experiences which were not denied normal children was common. Concerning the educable mentally retarded and the regular physical education class, Brace also found that the majority of physical educators feel that the EMR's and the normals can be placed in the same class. However, the trainable mentally retarded and the EMR should not be placed in the same class, and the TMR should never participate in physical education with the normal class. Indicative of the lack of concern for the physical well-being of the retarded is that two-thirds to four-fifths of all public schools fail to have adequate medical examinations for the mentally retarded, and physical

fitness testing is kept at a minimum; about three-fourth's of the schools surveyed excluded them. Brace's findings also revealed that participation in competitive sports (intramurals and extramurals) is also rare. Brace indicated that overall feeling of the physical educator toward the mentally retarded is one of empathy. Many feel that physical education can help the mentally retarded and physical education teachers of the retarded should be specially trained.

Development of physical education programs for the mentally retarded are necessary and can be accomplished. Benoit (14) re-emphasized the worth of these programs. For all children, normal and retarded, development of the mind is proportional to the extent of participation in fitness and motor skills. (2:138) In physical education the mentally retarded engages in maximum effort more readily than in the regular classroom. Achievement becomes meaningful. An awareness of self becomes a reality. Also, the mentally retarded are not to be underestimated. A program of fitness and motor skill learning can be an insult if placed below their level of competence. Movement and fitness experiences can be a source of enrichment; the mentally retarded can be assets to society.

A challenge is always present in the physical education class for the mentally retarded. The recognition of

intrinsic worth is difficult if not impossible for the re-
warded; therefore, encouragement in participation must be
present in every class. (14) Variety is also necessary for
prevention of monotony. A variety of skill levels must
also be met to provide a climate for skill development.

At Big Foot High School in Walworth, Wisconsin, an
adapted physical education program was established even
though their facilities were limited. (15) Action was
taken on the need for physical education for all students.

Research Concerning Physical Education
and Physical Fitness of the Educable Mentally Retarded

Adequate physical and motor development are essen-
tial for the attainment of physical education goals.
Children who are deficient in these areas must be identi-
fied. Sengstock (31:114) cited studies which show that the
mentally retarded do not perform as well as the intellec-
tually normal child on fitness and motor skill tests. In a
physical fitness test which he administered to educable
mentally retarded (EMR) children, he found that the EMR's
group mean was midway between a normal group of the same
chronological age and a normal group with the same mental
age. Therefore, he questioned placing the EMR in the same
physical education class with normal children of the same
chronological age. In Brace's (17) findings, the majority
of physical educators felt the normal and EMR can be inte-

grated. These contradictions--in reference also to Flora's recommendations--could be indicative of the need for more research in this area.

One of the most indepth studies to appear in the literature on physical education for the EMR was conducted by Broadhead. (42) The study attempted to determine the role of physical education in modifying the motor, intellectual, social, and emotional behavior of EMR and minimally brain injured (MBI) children of elementary school age. Physical education participation initiated positive changes in all areas of behavior in the EMR and the MBI; however, physical education orientated toward the individual rather than the group was more successful in bringing about positive changes. Behavior changes were shown: (1) more by older than by younger children, (2) more by the MBI than by the EMR, and (3) appeared more likely to occur in boys than in girls.

In another study of the effects of physical education on behavior changes, Gorder (21) divided 24 EMR boys into three groups of eight each who were equated by chronological age and intelligence quotient. Measurements were taken in (1) intellectual development, (2) physical development, and (3) social status. The training group and the officials group received physical education five times per week for four weeks. The control group received no physical

education. After four weeks the training group made significant gains in intelligence and physical fitness over the officials group and the control group; however, there was no difference in the three groups in social development.

In a study of strength and flexibility, Auxter (12) compared intellectually typical boys and non-brain damaged, brain damaged, and undifferentiated EMR boys. The chronological age of all boys ranged from 9 to 11 years while the intelligence quotient ranged from 50 to 79 for the EMR boys. Auxter tested grip strength (hand dynamometer) and leg strength (vertical jump test). Tests of flexibility were taken to measure trunk flexion-extension and ankle flexion-extension. Auxter found (1) significant differences between intellectually typical boys and each of the differentially diagnosed mentally retarded groups on the vertical jump, grip strength, and the ankle flexion-extension test of flexibility. There was no significant difference among groups on the flexibility measures of trunk flexion-extension. (2) The vertical jump measurements revealed significant differences in favor of the non-brain damaged group when compared to both the brain damaged and undifferentiated groups. However, there were no significant differences among differentially diagnosed mentally retarded boys on the ankle flexion-extension, trunk flexion-

extension, measures of flexibility, and static grip strength.

"Experimental research has shown that physical proficiency can be improved in the retarded." (33:177) This knowledge motivated Solomon and Pangle (33) to conduct a study on physical fitness proficiency and physical education participation in EMR boys. Forty boys were used as subjects, 24 experimental and 18 control, whose intelligence quotient ranged from 49 to 85 and chronological age ranged from 13 to 17 years. A pretest consisted of a portion of the "AAHPER Fitness Test for the Mentally Retarded" (chin-ups, sit-ups, and 50 yard dash). (6) Eight weeks later the same test was used as a posttest. During the eight weeks the experimental group received daily physical education (45 minute periods). The control group received no physical education. A substantial improvement in physical fitness was found in the experimental group while no improvement in physical fitness was found in the control group.

At Wakefield High School, Arlington, Virginia, Stein (36) conducted an EMR physical education class much like a normal class. Interestingly, fewer discipline problems occurred in the EMR class than would have in a normal class of the same age. Concerning objectives for the EMR class Stein stated that they should be the same as for the normal

class except that they should be more "concrete" than "abstract". He added that the success of the program is determined by how well the EMR understands the objectives for the class. Another important point stated by Stein dealt with communicating with the EMR class--objectives should be translated to the class in terms that they understand, but without "talking down" to them. Stein found this physical education program for the EMR to be highly successful and encouraged other educators not to forget the EMR in physical education participation.

Research Concerning Physical Education
and Physical Fitness of the Trainable Mentally Retarded

In testing two groups of trainable mentally retarded (TMR) boys where one group had a higher level of physical fitness development, Brown (18) found no significant difference between groups on nine physical fitness items.

Degree of physical development was expressed as a ratio of physical development, computed by dividing the subject's developmental age, determined by the Wetzel Grid (10), by his chronological age. This quotient was then multiplied by 100 to eliminate decimals. (18:7)

There are contradictions in the literature concerning this. With normal children Bookwalter (16) found a high relationship between development level and physical fitness performance. Also with normal children Solley (32) found that developmental level did not have a significant effect on

motor coordination performance.

In education proof of need is often the key to initiate a new program. (38) Lawhorne (28) administered a physical fitness test to the TMR at the Plymouth State Home and Training School at Northville, Michigan. A need was evident for a physical fitness program. The program established consisted of five exercises: (1) sit-ups, (2) push-ups, (3) pull-ups, (4) spring-ups, and (5) back bridges. The children were tested each week on how many of each exercise could be done during a 30 second time period. For motivation, which is especially important with the retarded, three levels of achievement were established for each exercise. When a specific level was attained in each exercise, the child received a badge. This motivation resulted in the majority of the boys working on their exercises everyday; thus, a successful physical fitness program was established.

A study on the circulorespiratory endurance of TMR boys was conducted by Campbell. (19) The Fair Physical Fitness Test was used. The endurance quotient of three TMR groups--chronological age 12-14 years, 15-17 years, and 18-20 years--was established plus that of a normal group of junior high boys. (The endurance quotient was determined by dividing the time for the 300 yard run by the time for the 25 yard dash times 12.) The endurance quotient

of the 18-20 year TMR group was found to be similar to the normal junior high group. Campbell concluded that the cardiorespiratory endurance of institutionalized TMR's did not vary by levels of chronological development.

The purpose of a study by Howe (24) was to compare TMR children and normal public school children of matched chronological age on motor skills. Howe stated that according to authorities there is little or no correlation between intelligence and motor ability. He found that the normal children were consistently superior to the TMR children on all motor skills used. Howe recommended that this be taken into consideration when planning a program of physical education for the TMR.

In a study of the effects of selected physical education programs on TMR children as it pertained to their physical fitness, IQ, and social maturity, Goodwin (44) compared a traditional physical education program and a movement exploration program. The subjects were divided into three groups (two experimental and one control) and were equated on the basis of sex, chronological age, and results of pretests. The experimental groups were exposed to a traditional physical education program which was group oriented and a movement exploration program where creativity was emphasized. The control group participated in normal classroom procedure which included a recreation program.

Findings of the study included: (1) between the two experimental groups, the traditionally taught group possessed a higher level of physical fitness on a posttest, (2) levels of physical fitness improved in both experimental groups over that of the control group, (3) there was no significant difference in either experimental programs as to their effect on social maturity, (4) the movement exploration program was slightly favored in IQ improvement, and (5) there was significant improvement between the pretest and posttest mean scores of both experimental groups on physical fitness, IQ, and social maturity.

Funk (22) included 36 TMR boys and girls between the chronological ages of 8 and 18 in a study of the effects of physical education on physical fitness. The 36 subjects were evenly divided into a control group and a experimental group. For 58 days the experimental group participated in daily physical education (30 minute periods) while the control group received no physical education. For the pretest and the posttest the physical fitness test was a combination of "Physical Fitness for the Mentally Retarded" (7) and the "Special Fitness Test for the Mentally Retarded" (6). The only increase in fitness was found in the experimental group in the shuttle run and the sit-ups. During the physical education exposure there was no emphasis on increasing arm and shoulder girdle strength; however the

experimental group engaged in such running activity which accounted, Funk believed, for the improvement in the shuttle run. Funk reasoned that the increase in sit-ups was due to subjects awareness of and responsiveness to what was expected of them.

Summary of Related Literature

Throughout the literature emphasis is placed on the importance of physical education and physical fitness for the mentally retarded. Physical educators generally agree that the mentally retarded will benefit from an organized program of physical education. Hopefully research will continue in this area and positive steps will be taken to include the mentally retarded in physical education.

CHAPTER III

PROCEDURES

This chapter explains the procedures of this study. The first section discusses the preliminary procedures and the second section the data gathering procedures.

Preliminary Procedures

The preliminary procedures were: (1) arrangements for the study, and (2) selection of the physical fitness test.

Arrangements for the Study

Administrative procedures were necessary before the physical fitness test could be administered. Permission was given by Mr. Evan Lowrey, Educational Services Director for the La Crosse, Wisconsin Public Schools, to test two groups of trainable mentally retarded and one group of educable mentally retarded in the La Crosse Public School System. (Appendix A) Further arrangements for testing dates were made with the principals and physical educators at the respective schools.

Letters of introduction were obtained from Mr. Jon Boyd, Director of Special Education for the Wisconsin Cooperative Educational Service Agency No. 11, and presented to school administrators at Black River Falls, Wisconsin, and Elk Creek, Wisconsin. (Appendix A) Permission was given by

principals of special education schools in Squaw Creek and Elk Creek, Wisconsin, and testing dates were scheduled.

(Appendix A)

Selection of the Physical Fitness Test

The basis for choosing the "Fait Physical Fitness Test for the Mentally Retarded" (3:69) as the measuring instrument in this study was : (1) recognition of test validity by Dr. Julian U. Stein, Consultant in Programs for the Handicapped, American Association for Health, Physical Education, and Recreation (Appendix A), (2) demonstration by Dr. Hollis Fait of satisfactory reliability and validity of the test. (38), and (3) the convenience of administering the test in one session per subject.

The "Fait Physical Fitness Test for the Mentally Retarded" was financed by a grant from the Joseph P. Kennedy, Jr., Foundation. The test was constructed at the Physical Efficiency Laboratory at the University of Connecticut under the direction of Dr. Hollis Fait in conjunction with the Mansfield State Training School. (4:345) The test assesses physical abilities in muscular and organic fitness using: (1) the bent arm hang, (2) leg lift, (3) static balance test, (4) leg thrust, (5) the 25 yard dash and (6) the 300 yard run-walk.

Bent Arm Hang. A doorway-horizontal bar was used for this test. A stool or chair was placed under the bar. The

subject stood on the stool and took hold of the bar with both hands, using a reverse grip (palms toward face). The hands were shoulder width apart. The subject brought his head to the bar, pressed the bridge of his nose to the bar and stepped off the stool. The timer started the watch as the subject's nose was pressed to the bar and the body weight was taken on the arms. The watch was stopped when the subject dropped away from the bar. If the subject slipped from the bar the tester was ready to catch him.

Leg Lift. The subject laid on his back with his hands clasped behind his neck. The tester held the subject's elbows to the mat. The subject raised his legs, keeping the knees straight until they were at a 90 degree angle. The timer who stood to the side of the subject, extended one hand over the subject's abdomen at the height of the ankles when the legs were fully lifted. This served as a guide to the subject in achieving the desired angle and encouraged him to keep the legs straight. He was instructed to touch the shins against the timer's arm. The subject did as many leg lifts as possible in the 20 second time limit. He began on the command of "Ready, Begin" and ceased on the command of "Stop". The score was the number of leg lifts performed in 20 seconds.

Static Balance Test. The subject placed his hands on his hips, lifted one leg and placed the foot on the inside

of the knee of the other leg. He then closed his eyes and maintained his balance in this position as long as he could. The watch started the moment he closed his eyes. As soon as the subject lost his balance, opened eyes and/or lowered raised foot, the watch stopped. The score was the number of seconds, to the nearest one-tenth of a second.

Thrust. The subject took a squatting position with the feet and hands flat on the floor. The knees made contact with the arms. At the command "Go", the stop watch was started. The subject supported his weight on his hands so that he could thrust his legs straight out behind him. The legs were returned to the original position. The score was the number of complete thrusts the subject could perform in 20 seconds.

Twenty-Five Yard Run. The subject placed his lead foot even with the starting line. He then took a semi-crouch position. His head was held up so that he was looking toward the finish line. The subject was encouraged, before and during the run, to run fast. At the command of "Ready, Go" the subject began the run. The watch started on the "Go" and stopped as the subject passed the finish line. However, the subject was directed to run to a second line, which was about 5 feet beyond the finish line, to prevent his slowing down as he approached the finish line. The time of the run was recorded to the nearest one-

tenth of a second.

300 Yard Run-Walk. At the starting line, the subject placed one foot comfortably ahead of the other. A semi-crouch position was taken. At the command of "Ready, Go", the subject began the run and the watch was started on "Go". The subject ran six times around a course, 25 feet by 50 feet with a 5 foot running lane, as fast as he could. The subject was encouraged before and during the run not to stop and to keep on running. He was told how many laps remained after each time around, and was allowed to walk part of the distance if he was unable to run the total distance. The time required to complete six laps was the score.

The test items were administered in the sequence recommended by Fait (3:69): (1) 25 yard dash, (2) bent arm hang, (3) leg lift, (4) static balance, (5) thrust, and (6) 300 yard run-walk.

Test Validity and Reliability

A total of 40 tests was examined initially for possible use in the physical fitness test battery for the mentally retarded. All of these tests were items that are widely accepted as tests that measure some factor of physical fitness contributing to success in motor movement. Modifications of some test items were made to reduce the complexity of movements required to perform them, thereby reducing also the need for memorizing a difficult movement pattern and retaining detailed directions. The test items were administered in both their original form

and their modified form to the mentally retarded youngsters participating in the study. Any tests which produced a large number of failures were eliminated.

The relationship between the scores achieved on the remaining test items in both forms and the I.Q. of the subject was determined using Pearson's Product Moment of Correlation. Those test items which had a high correlation were eliminated. Some original tests, which because of their simplicity had a low correlation, were retained for possible inclusion in the battery. The modified test items which had not been eliminated were administered along with the original test items from which they were derived to children with normal intelligence. When a high correlation was found between scores on both forms of a test item, the modified item was accepted as measuring the same physical fitness factor as the original and was retained as part of the battery. In a test re-test with the mentally retarded subjects, it was shown that all the remaining tests had a high reliability.

In the next step, a correlation was run to determine possible duplication of tests in measuring the same item. A final selection was made in those cases in which there were duplications. An item which was like or very similar to an item used in the physical fitness battery for normal children was given preference in this final selection. (38)

Data Gathering Procedures

The data gathering procedures were: (1) pretesting of subjects, (2) physical education exposure, (3) post-testing of subjects, and (4) treatment of data.

Pretesting of Subjects

Five groups (Table I, Appendix B) were pretested using the "Fait Physical Fitness test for the Mentally Retarded". (3:69) The total population included thirty-

nine subjects with chronological ages from five to twenty years. Testing began on September 28, 1971 and ended on October 14, 1971. A physical education graduate student with previous experience in working with mentally retarded children assisted in administering the fitness test. The assistant served as a timer and recorder of scores.

Procedures for administering each part of the fitness test consisted of: (1) explaining and demonstrating each part of the test, (2) allowing two trials of each exercise except for the 25 yard run and 300 yard run-walk, (3) subjects performing each exercise as explained in the test description (3:69), and (4) recording each subject's scores in raw data. Raw data scores were transferred to group score sheets. (Appendix C) Refer to Table I for personal data on subjects.

TABLE I
PERSONAL DATA ON ORIGINAL THIRTY-EIGHT SUBJECTS

Group A

Subject	TMR				Subject	EMR			
	CA	Sex	IQ	MA		CA	Sex	IQ	MA
1	9	M	39	4	1	14	M	69	10
2	11	M	54	6	2	16	M	62	10
3	15	M	45	7	3	13	F	58	8
4	19	M	44	8					
5	15	F	42	6					
6	8	F	53	4					
7	16	F	20	3					
8	18	M	53	10					
9	8	F	30	2					

Mean: TMR CA 13.2, MA 5.5 Ages recorded in years
EMR CA 14.3, MA 9.0

TABLE I (cont.)

PERSONAL DATA ON ORIGINAL THIRTY-EIGHT SUBJECTS

Group B - TMR					Group C - TMR				
Subject	CA	Sex	IQ	MA	Subject	CA	Sex	IQ	MA
1	20	F	38	8	1	17	M	32	5
2	11	F	25	3	2	15	M	46	7
3	16	M	44	7	3	15	F	54	8
4	19	M	35	7	4	18	F	47	9
5	17	F	38	7	5	16	M	49	8
6	11	M	38	4					
7	7	M	48	3					
Mean: CA 14.5, MA 6					Mean: CA 16.2, MA 7				

Group D - TMR					Group E - EMR				
Subject	CA	Sex	IQ	MA	Subject	CA	Sex	IQ	MA
1	8	M	45	4	1	12	M	78	9
2	8	M	43	3	2	11	F	77	9
3	12	M	34	4	3	12	M	74	10
4	11	M	45	5	4	12	M	85	11
5	11	M	45	5	5	11	F	68	8
6	14	F	46	7	6	12	F	72	9
7	13	F	39	5	7	11	F	84	9
Mean: CA 9.5, MA 6					Mean: CA 11.5, MA 9				

Physical Education Programs

Four of the five groups tested for physical fitness were exposed to their physical education program for a 27 week period. The breakdown of the groups was: (1) Group A received physical education one period per week under a certified physical education teacher, (2) Group C received daily physical education under a physical education student teacher, (3) Group D received daily physical education under a certified physical education teacher and a student

teacher, and (4) Group E received daily physical education under a physical education student teacher. The researcher had no influence on any of the physical education programs.

Physical Education Facilities

Facilities generally varied for each group: (1) Group A used a large all-purpose room for physical education indoors; weather permitting the class was held outdoors, (2) Group B was outside, weather permitting, for recreation and free play, (3) Group C and D participated in physical education outside in autumn and spring and in a gymnasium during the winter, and (4) Group E received physical education outside during autumn and spring and inside in a large assembly room and stage area during the winter.

Posttest Procedures

Of the original thirty-nine subjects pretested, thirty-eight were posttested. One subject was excluded since his family moved out of the school district.

A time duration of 27 weeks elapsed between pretest and posttest. Procedures were the same as with the pretest. However, an undergraduate physical education major with previous experience in working with mentally retarded children replaced the graduate student as an assistant. The same sites were used for administering the test. Again the scores for each subject were entered in raw data on the score sheets.

CHAPTER IV

ANALYSIS OF DATA

Data for each subject on the pretest and posttest were collected and recorded on the same score sheet. The t ratio was utilized to determine if any significant change had occurred in muscle fitness and organic fitness within each group.

Analysis of Data to Test Hypotheses

Hypothesis A

Hypothesis A stated there would be no significant gain in muscle fitness and organic fitness in groups that received one-time-per-week or no physical education. The Student's t test was the statistical measurement utilized to determine if there was a significant fitness gain within groups. As indicated in Table II and III, except for the thrust test, no significant gain was found in the trainable mentally retarded (TMR) and educable mentally retarded (EMR) of Group A which received one hour per week of physical education instruction.

Group B received no physical education instruction. Table IV reveals no significant gain in muscle fitness and organic fitness

Hypothesis B

Hypothesis B stated there would be a significant gain in muscle fitness and organic fitness in groups that received daily physical education.

The statistical measurement used was the t test, the same as used in hypothesis A. As shown in Tables V, VI, and VII, no significant gain was found in the physical fitness level of the TMR, Group C and D, and the EMR, Group E. Only in Group G was there a significant gain in the leg lift.

TABLE II
WITHIN GROUP MEAN GAIN SCORE DIFFERENCE
IN PHYSICAL FITNESS

Group A - TMR

Tests	df	M_1	M_2	$M_1 - M_2$	$SE_{M_1 - M_2}$	t
25 Yd Run	8	6.59	6.99	.40	.25	1.59
Arm Hang	8	7.95	9.49	1.54	1.83	.84
Leg Lift	8	7.66	9.11	1.45	.88	1.63
Balance	8	2.78	2.87	.09	.59	.15
Thrust	8	6.11	9.22	3.11	.53	5.78*
300 Yd Run	8	138.00	134.00	4.00	7.46	.45

*significant at the .05 and .01 level

TABLE III
 WITHIN GROUP MEAN GAIN SCORE DIFFERENCE
 IN PHYSICAL FITNESS
 Group A - EMR

Tests	df	M ₁	M ₂	M ₁ -M ₂	SE _{md}	t
25 Yd Run	2	5.16	5.10	.06	.08	.75
Arm Hang	2	26.06	21.89	.83	8.81	.47
Leg Lift	2	10.00	11.66	1.66	.88	1.89
Bal- ance	2	7.40	15.06	7.66	5.29	1.44
Thr ust	2	9.00	13.33	4.33	2.18	1.98
300 Yd Run	2	89.00	84.66	4.34	1.45	2.98

TABLE IV
 WITHIN GROUP MEAN GAIN SCORE DIFFERENCE
 IN PHYSICAL FITNESS
 Group B - TMR

Tests	df	M ₁	M ₂	M ₁ -M ₂	SE _{md}	t
25 Yd Run	6	6.75	7.33	.58	.24	2.42
Arm Hang	6	14.24	9.30	4.94	4.87	1.02
Leg Lift	6	7.14	8.00	1.14	.46	1.87
Bal- ance	6	2.74	4.19	1.45	1.65	.89
Thr ust	6	7.86	9.29	1.43	.75	1.90
300 Yd Run	6	119.71	137.00	17.29	11.32	1.53

TABLE V
 WITHIN GROUP MEAN GAIN SCORE DIFFERENCE
 IN PHYSICAL FITNESS
 Group C - TMR

Tests	df	M ₁	M ₂	M ₁ -M ₂	SE _{md}	t
25 Yd Run	4	5.66	5.36	.30	.08	2.25
Arm Hang	4	5.25	5.45	.20	1.00	.20
Leg Lift	4	7.80	11.40	3.60	.75	4.81*
Bal- ance	4	1.36	2.62	1.26	.86	1.47
Thr ust	4	7.00	9.80	1.80	.97	2.89
300 Yd Run	4	110.66	105.33	5.33	7.36	.75

*significant at the .05 and .01 level

TABLE VI
 WITHIN GROUP MEAN GAIN SCORE DIFFERENCE
 IN PHYSICAL FITNESS
 Group D - TMR

Tests	df	M ₁	M ₂	M ₁ -M ₂	SE _{md}	t
25 Yd Run	6	9.37	9.74	.37	.32	1.18
Arm Hang	6	1.74	.99	.85	.42	1.81
Leg Lift	6	6.57	7.43	.86	.51	1.69
Bal- ance	6	.74	1.14	.40	.26	1.63
Thr ust	6	3.86	5.14	1.28	.52	2.46
300 Yd Run	6	148.00	163.71	15.71	7.75	2.03

TABLE VII
 WITHIN GROUP MEAN GAIN SCORE DIFFERENCE
 IN PHYSICAL FITNESS

Group E - EMR

Tests	df	M_1	M_2	$M_1 - M_2$	$SE_{M_1 - M_2}$	t
25 Yd Run	6	5.14	5.11	.03	.09	.33
Arm Hang	6	9.61	14.20	4.59	3.17	1.45
Leg Lift	6	11.57	12.85	1.28	.84	1.54
Bal- ance	6	20.04	23.47	3.43	1.60	2.14
Thr ust	6	15.43	16.14	.71	.81	.88
300 Yd Run	6	96.14	88.00	8.14	3.41	2.39

Analysis of Variance

Additional analysis of the data were computed to determine the variances of the groups beyond that called for by the the hypotheses of the study. Results of these tests are shown in Table VIII below which reveals there was a significant difference between all the groups in physical fitness on the pretest and on the posttest.

TABLE VIII
ONE WAY ANALYSIS OF VARIANCE
OF THE PRETEST AND POSTTEST GROUP MEAN SCORES
OF PHYSICAL FITNESS

Test	df	MB	F
Pretest	5, 30	114.684	103.812*
Posttest	5, 30	188.374	64.017*

*significant at .01 level

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

Problems

The primary problem in this study was to evaluate the effects of physical education participation on the physical fitness level of trainable and educable mentally retarded children. More specific problems included the effect on physical fitness of: (1) programs conducted by physical educators and/or student teachers, (2) integrated physical education programs, (3) a mixed physical education program for trainable and educable mentally retarded, and (4) no physical education participation.

Procedures

Thirty-eight trainable and educable mentally retarded children ranging in age from 9 to 20 years were tested for muscle fitness and organic fitness. The "Fait Physical Fitness Test for the Mentally Retarded" (2:69) allowed each subject to be tested at one meeting. Raw data was recorded on a score sheet.

During the twenty-seven weeks preceding the physical fitness posttest each subject was exposed to his physical education program at his school. The researcher had no

influence on any of these programs.

The original thirty-eight subjects were posttested using the same physical fitness test. Instead of the same physical education graduate student assisting in administering the test, an undergraduate physical education student served in this capacity. Raw data was recorded on the same score sheet.

Summary of Findings

The t test between within group mean scores revealed no significant difference in muscle fitness and organic fitness in each group studied.

Conclusions

As a result of the findings of this study, the following conclusions were made within the limits of this study:

- A. The one-hour-per-week physical education program of Group A had no significant effect on muscle fitness and organic fitness, and it appears that the outside of school activities of Group A had no effect on muscle fitness and organic fitness in the duration of time between pretest and posttest.
- B. Normal school activities of Group B with no formal physical education had no effect on muscle fitness and organic fitness, and it appears that the outside of school activities of Group B had no effect

on muscle fitness and organic fitness in the duration of time between pretest and posttest.

- C. The Group C daily program of physical education conducted by a student teacher had no significant effect on muscle fitness and organic fitness.
- D. The Group D daily program of physical education conducted by a certified physical education teacher and a student teacher had no significant effect on muscle fitness and organic fitness.
- E. The Group E daily integrated program of physical education had no significant effect on muscle fitness and organic fitness.
- F. Related literature concerning daily programs of physical education and physical fitness for the trainable and educable mentally retarded showed a general trend toward positive changes in muscle fitness and organic fitness; therefore, it appears the quality of the daily physical education programs in this study can be questioned.

Recommendations

The following recommendations were made based on the findings of this study:

- A. Physical education and fitness programs for special education students should be evaluated and positive steps taken, where needed, to best utilize

programs and facilities for maximum benefit in muscle fitness and organic fitness.

- B. More studies should be conducted to determine whether the muscle fitness and organic fitness needs of special education students are being met.
- C. The daily physical education program for the children tested in this study should be evaluated for their effectiveness in meeting muscle fitness and organic fitness needs.
- D. A program designed to develop optimum muscle fitness and organic fitness should be offered for the groups in this study which presently have physical education once-a-week or not at all.
- E. Additional studies, to include a larger number of subjects, should be conducted of the same nature as this study.

SOURCES CONSULTED

SOURCES CONSULTED

A. BOOKS

1. Fait, Hollis F. Adapted Physical Education. Philadelphia: W.B. Saunders Company, 1960.
2. Fait, Hollis F. Physical Education for the Elementary School Child. Philadelphia: W.B. Saunders Company, 1971.
3. Fait, Hollis F. Special Physical Education: Adaptive, Corrective, Developmental. Philadelphia: W.B. Saunders Company, 1969.
4. Hooley, Agnes M. and Wheeler, Ruth H. Physical Education for the Handicapped. Philadelphia: Lea and Febiger, 1969.
5. Howland, Ivalclare S. Adapted Physical Education in Schools. Dubuque, Iowa: William C. Brown Company, 1966.

B. MANUALS AND PAMPHLETS

6. American Association for Health, Physical Education, and Recreation. Special Fitness Test Manual for the Mentally Retarded. Washington, D.C.: The Association, 1968.
7. Hayden, Frank J. Physical Fitness for the Mentally Retarded. Toronto, Ontario: Metropolitan Toronto Association for Retarded Children, 1964.
8. National Association for Retarded Children, Inc. The Retarded Can Be Helped. New York: National Association for Retarded Children, 1963.
9. State of Wisconsin. Questions about Mental Retardation. Madison, Wisconsin: Wisconsin Department of Public Instruction, Bulletin No. C-59.
10. Wetzel, Norman G. Instruction Manual in the Use of the Grid for Evaluating Physical Fitness. Cleveland, Ohio: NEA Services, Inc., 1941.

C. PERIODICALS

11. Auxter, David M. "Muscular Fatigue of Mentally Retarded Children," Training School Bulletin, 63:5-10, May, 1966.
12. Auxter, David M. "Strength and Flexibility of Differentially Deagnosed Educable Mentally Retarded Boys," Research Quarterly, 37:455-61, 1966.
13. Auxter, David M. "Training Undergraduate Physical Education Majors to Work with the Mentally Retarded," Journal of Health, Physical Education, and Recreation, 39:61-2, April, 1968.
14. Benoit, Paul J. "Extending the Mind Through the Body," Journal of Health, Physical Education, and Recreation, April, 1966.
15. Bidwell, Dwight, and Romanesko, Merlin. "Handicapped Students Shape Physical Fitness Program," Wisconsin Journal of Education, 10:15, November, 1968.
16. Bookwalter, Karl W., and others. "The Relationship of Body Size and Shape to Physical Performance," Research Quarterly, 23:271-79, October, 1952.
17. Brace, D. R. "Physical Education and Recreation of Mentally Retarded Pupils in Public Schools," Research Quarterly, 39:779-82, October, 1968.
18. Brown, Joe. "Ratio of Physical Development as a Factor in Performance of Retarded Boys on Physical Fitness," Training School Bulletin, 65:7-11, May, 1968.
19. Campbell, Donald E. "Circulorespiratory Endurance of Three Age Groups of Institutionalized Trainable Mentally Retarded Males," Training School Bulletin, August, 1969.
20. Cook, D. "The Hawthorne Effect in Educational Research," Phi Delta Kappa, 44:116-22, April, 1962.
21. Gorder, Owens W. "Effects of Physical Education on the Intellectual, Physical, and Social Development of Educable Retarded Boys," Exceptional Children, 32: 357-63, February, 1966.

22. Funk, Dean G. "Effects of Physical Education on Fitness and Motor Development of Trainable Mentally Retarded Children," Research Quarterly, 42:142-46, March, 1971.
23. Hilsendager, Donald R.; Jack, Harold K.; and Mann, Lester. "The Buttonwood Farms Project," Journal of Health, Physical Education, and Recreation, 39:46-8, March, 1968.
24. Howe, C. E. "A Comparison of Motor Skill of Mentally Retarded and Normal Children," Exceptional Children, 25:353-54, 1959.
25. Klausmeier, Herbert. "Physical Growth of Mentally Retarded Children," School and Society, 86:140, March, 1958.
26. Kraus, Hans, and Hirschland, Ruth. "Minimum Muscular Fitness Tests in School Children," Research Quarterly, 25:178-87, May, 1954.
27. Kulcinski, L. E. "The Relation of Intelligence to the Learning to Fundamental Muscular Skill," Research Quarterly, 16:266-76, December, 1945.
28. Lawhorne, Wayne F. "Physical Fitness for the Mentally Retarded: A Reality," Training School Bulletin, 63:45-8, August, 1966.
29. Nasatir, Steven B. "Developing a Meaningful Adaptive Physical Education Program," The Physical Educator, 28:140-1, October, 1971.
30. Oliver, J.N. "The Effects of Physical Conditioning on the Sociometric Status of Educationally Sub-Normal Boys," Physical Education, 156:38-46, 1960.
31. Sengstock, Wayne L. "Physical Fitness of Mentally Retarded Boys," Research Quarterly, 37:113-20, March, 1966.
32. Solley, William H. "Ratio of Physical Development as a Factor in Motor Co-ordination of Boys ages 10-14," Research Quarterly, 28:295-303, 1957.
33. Solomon, A. and Fangle, R. "Demonstrating Physical Fitness Improvement in the Educable Mentally Retarded," Exceptional Children, 34:177-81, 1967.

34. Stein, Julian U. "Adapted Physical Education for the Educable Mentally Handicapped," Journal of Health, Physical Education, and Recreation, 33:30-1, December, 1962.
35. Stein, Julian U. "The Potential of Physical Activity for the Mentally Retarded," Journal of Health, Physical Education, and Recreation, 37:25-8, April, 1966.
36. Stein, Julian U. "A Practical Guide to Adapted Physical Education for the Educable Mentally Retarded," Journal of Health, Physical Education, and Recreation, 33:30-5, 1962.

D. SPEECHES, LECTURES, AND CORRESPONDENCE

37. Fait, Hollis F. Personal Correspondence, University of Connecticut; Storrs, Connecticut, November, 1971.
38. Rog, James. Lecture on "The Curriculum in Physical Education," University of Wisconsin-La Crosse, April, 1971.
39. Stein, Julian U. Personal Correspondence, Programs for the Handicapped, American Association of Health, Physical Education, and Recreation, December, 1971.
40. Stein, Julian U. Speech given at the University of Wisconsin-La Crosse, November 3, 1971.

E. UNPUBLISHED MATERIALS

41. Brace, D. R. "Motor Fitness of Mentally Retarded Boys Relative to National Norms," Paper read at the Research Section, American Association for Health, Physical Education, and Recreation Convention, Atlantic City, New Jersey, March 18, 1961.
42. Broadhead, Geoffrey D. "The Role of Educational Physical Activity Programs in the Modification of Selected Parameters of the Behavior of Educable Mentally Retarded Children and Minimally Brain Injured Children of Elementary School Age," Unpublished Doctoral Dissertation, University of Wisconsin, 1968.

43. Flora, Floyd. "A Comparison of Motor Educability of Trainables, Educables, and Normal 10 and 11 Year Old Boys in Wausau, Wisconsin," Unpublished Seminar Paper, University of Wisconsin-La Crosse, 1968.
44. Goodwin, Lane A. "The Effects of Two Selected Physical Education Programs on Trainable Mentally Retarded Children," Unpublished Doctoral Dissertation, University of Utah, 1970.
45. Lauscher, James R. "The Effects of a Concentrated Physical Education Program Emphasizing Psychomotor Development on the Motor Development of the Mentally retarded," Unpublished Seminar Paper, University of Wisconsin-La Crosse, 1968.
46. State of Wisconsin. Unpublished Proposal for a Survey of Adaptive Physical Education Programs in State Schools. Department of Public Instruction, 1971.

APPENDIXES

APPENDIX A

LETTERS

AMERICAN ASSOCIATION FOR
HEALTH, PHYSICAL EDUCATION, AND RECREATION
1201 16th Street NW, Washington, D.C. 20036

December 15, 1971

Mr. Raymond Wondergem, Jr.
Graduate Student, U. of Wisconsin
R.R. 2, Smith Valley
La Crosse, Wisconsin 54601

Dear Mr. Wondergem:

In response to your recent letter, we are contacting you about the Physical Fitness Test Battery for Mentally Retarded Children developed by Dr. Hollis Fait, University of Connecticut, Storrs.

This battery consists of six items which are appropriate for both educable and trainable mentally retarded youngsters. Test items do not require memorization of difficult movement patterns or do not have detailed directions. Activities are those in which most retarded youngsters can experience some degree of success and in which intellectual factors do not weigh heavily in successful performance. Differential scoring scales are available for both education and trainable according to sex and age. Activities are easy to administer and provide samples of such fitness characteristics as speed-power, arm and shoulder endurance, abdominal endurance, static balance, and specific coordination. The 300 yard run walk is included as a measure of cardio-respiratory endurance. However, there is question as to whether or not this distance is long enough to create sufficient cardiac stress to in face measure cardio-respiratory endurance.

This test battery as much as any other is valid in obtaining data about the function of mentally retarded youngsters in specific physical fitness activities. Contact Dr. Fait directly for information about validity and reliability of the battery and individual test items.

Our staff will welcome an opportunity to review your study when it is completed.

Sincerely,

Julian U. Stein, Consultant
Programs for the Handicapped

LA CROSSE AREA PUBLIC SCHOOLS

5th and Cass Sts., La Crosse, Wis. 54601

September 22, 1971

Mr. Raymond Wondergem, Jr.
R.R. #2, Smith Valley
La Crosse, Wisconsin 54601

Dear Mr. Wondergem:

This letter is to confirm that you are granted permission to administer a physical fitness test to the trainable mentally retarded children at Jefferson and Roosevelt Schools. Such permission must also be acquired from each of the building principals.

Should your testing and study produce any information which would be of help and interest to the schools, I am sure it would be appreciated if you could share it.

Good luck with your study.

Sincerely,

Evan J. Lowrey, Director
Educational Services

EJL/lg

CESA 11

Special Education Center

State Cooperative Educational Service Agency

Box 388, Holmen, Wisconsin 54636

September 7, 1971

Mr. Robert Benedict
Black River Falls High School
Black River Falls, Wisconsin 54615

Dear Mr. Benedict:

This letter is to introduce Mr. Raymond Wondergem of Wisconsin State University, La Crosse.

He is interested in conducting a research project in physical education for the T.M.R. (Details will be explained by Mr. Wondergem).

Your cooperation will be greatly appreciated concerning this project.

Sincerely yours,

Jon Boyd
C.E.S.A. #11
Dir. of Spec. Ed.

cc: Mr. Raymond Wondergem

JB/ob

SCHOOL DISTRICT JOINT NO. 2
Black River Falls, Wisconsin 54615
Sept. 22, 1971

Mr. Raymond Wondergem, Jr.
Rt. 2, Smith Valley
La Crosse, Wisconsin 54601

Dear Mr. Wondergem,

This is to inform you that you have our permission to do physical fitness testing of the children in our Trainable Mentally Retarded classroom in the Squaw Creek school. All activities and schedules must be to the satisfaction of the teacher, Mrs. Mary Gjerseth.

We hope this is a pleasant and successful experience for you.

Sincerely yours,

Jim E. Claude
Elementary Supervisor

JEC:me

APPENDIX B
TESTING DATA

TEST DATA OF ORIGINAL THIRTY-EIGHT SUBJECTS

Group A - TMR

Sub ject	Pretest					Posttest						
	25Y Run	Arm Hang	Leg Lift	Bal ance	Thr ust	300 Run	25Y Run	Arm Hang	Leg Lift	Bal ance	Thr ust	300 Run
1	8.3	1.0	5	1.5	4	139	7.6	4.0	9	2.1	7	156
2	6.6	1.3	6	1.9	7	128	6.6	1.4	10	2.0	9	129
3	5.5	16.7	8	4.0	6	88	4.8	28.2	8	7.4	10	84
4	4.4	8.3	11	2.8	6	98	4.8	14.8	9	1.5	12	118
5	4.6	1.0	9	5.0	6	111	5.9	1.0	9	3.0	8	110
6	7.5	2.3	7	2.6	7	157	8.7	3.9	10	1.4	8	167
7	10.7	1.0	5	0.0	2	281	11.1	1.0	10	1.0	7	225
8	4.0	37.9	12	4.3	13	87	5.1	29.1	10	6.0	15	82
9	7.8	2.1	6	3.0	4	153	8.4	2.1	7	1.5	7	141

Group A - EMR

1	5.1	7.2	10	10.7	5	87	5.2	13.4	12	19.0	11	85
2	4.8	54.6	11	7.7	15	84	4.7	32.9	14	24.2	15	77
3	5.6	16.4	9	3.8	7	96	5.4	19.4	9	2.0	14	92

Group B - TMR

1	6.2	6.3	9	5.0	11	122	5.8	5.9	11	2.7	14	124
2	6.7	1.0	6	3.5	7	129	8.0	1.9	6	1.5	8	191
3	5.0	64.4	8	2.0	6	91	5.8	3.2	7	9.9	11	90
4	5.4	25.0	9	2.6	15	96	5.5	15.5	11	10.0	14	91
5	6.4	1.0	8	3.5	6	86	6.6	1.9	8	2.2	7	140
6	6.9	2.0	5	1.2	7	123	7.7	6.9	6	1.0	7	148
7	10.7	0.0	5	1.4	3	185	11.9	1.0	7	2.1	4	175

Group C - TMR

1	6.3	5.2	8	2.6	8	129	5.9	6.6	13	6.5	10	132
2	4.9	14.8	11	2.1	13	96	4.6	16.1	15	2.4	15	76
3	5.8	6.3	9	2.1	9	107	5.6	2.7	12	1.2	9	108
4*	---	0.0	2	0.0	0	---	---	0.0	7	0.5	5	---
5*	---	0.0	9	0.0	5	---	---	1.9	10	2.5	10	---

*physical disability prevented running

TEST DATA OF ORIGINAL THIRTY-EIGHT SUBJECTS (cont.)

Group D - TMR

Sub ject	Pretest					Posttest						
	25Y Run	Arm Hang	Leg Lift	Bal ance	Thr ust	300 Run	25Y Run	Arm Hang	Leg Lift	Bal ance	Thr ust	300 Run
1	8.7	1.0	12	1.0	6	170	8.8	1.0	12	1.5	7	172
2*	7.5	4.3	4	1.0	5	---	7.6	1.5	6	2.5	5	---
3	12.3	0.0	5	1.0	3	212	12.2	0.0	5	0.5	3	212
4	11.5	1.0	3	1.0	4	194	11.7	1.0	6	0.7	5	202
5	8.6	1.0	7	1.0	3	180	9.0	1.0	8	2.0	7	237
6	8.7	2.3	8	0.0	4	131	8.4	1.5	9	0.5	6	155
7	8.3	2.6	7	0.0	2	149	10.5	0.9	6	0.3	3	168

Group E - EMR

1	4.8	27.0	12	7.2	16	83	4.7	32.1	12	4.6	17	72
2	5.0	16.1	13	98.0	17	92	5.1	23.2	15	105.0	16	80
3	5.0	3.6	12	5.1	16	89	5.0	0.7	10	10.1	18	86
4	4.8	15.2	14	17.3	16	80	4.5	37.0	15	25.2	18	73
5	6.4	1.0	8	3.4	8	120	6.8	1.0	8	2.2	6	129
6	5.3	3.4	12	2.3	16	122	5.1	1.9	16	3.6	20	104
7	4.7	1.0	10	7.0	19	87	4.6	3.5	14	13.6	18	72

*physical disability prevented long distance running

APPENDIX C
SCORE SHEET

Name _____ I.Q. _____

Pretest Posttest

5 yd run _____

Bent Arm Hang _____

Leg Lift _____

Balance _____

Thrust _____

300 yd Run-Walk _____

Comments _____

Name _____ I.Q. _____

Pretest Posttest

25 yd run _____

Bent Arm Hang _____

Leg Lift _____

Balance _____

Thrust _____

300 yd Run-Walk _____

Comments _____

Name _____ I.Q. _____

Pretest Posttest

5 yd run _____

Bent Arm Hang _____

Leg Lift _____

Balance _____

Thrust _____

300 yd Run-Walk _____

Comments _____

Name _____ I.Q. _____

Pretest Posttest

25 yd run _____

Bent Arm Hang _____

Leg Lift _____

Balance _____

Thrust _____

300 yd Run-Walk _____

Comments _____