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Evaluation of Monroe Public School Children Grades One Through Five Using the Washington State Elementary Physical Fitness Test

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EVALUATION OF MONROE PUBLIC SCHOOL CHILDREN GRADES ONE THROUGH FIVE USING THE WASHINGTON STATE ELEMENTARY PHYSICAL FITNESS TEST

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CHAPTER I

THE PROBLEM AND DEFINITION OF TERMS

Measurement in physical education is an important tool to be used in determining the scope and emphasis necessary for a satisfactory physical education course presentation in today's schools. Without the development of measurement we would not have reached the program level now being presented. Clarke states the physical fitness objective is basic and that all pupils should be assured of at least a minimum amount of this quality. Without this all other phases of the program are ineffective. Consequently definite steps should be taken to ascertain the physical fitness of each pupil in school (8:52).

I. THE PROBLEM

Statement of the problem. The purpose of this study was (1) to determine the physical fitness of the elementary students in Monroe Public Schools using the Washington State Elementary School Physical Fitness Test and (2) to enlighten administrators, teachers and parents as to the physical fitness of these students.

Importance of the study. Measurement in physical fitness is essential for the physical educator in his

attempt to improve the fitness of school children.

Kraus and Hirschland state that "children coming into the first grade are already seriously deficient. Furthermore, it appears that we are unable to alleviate this situation during the time the children are in elementary schools. They leave elementary school in very much the same condition as when they entered it--if anything a little worse" (14:179).

In a recent study by Campbell and Pohndorf, 10,000 British boys and girls were given the AAHPER Physical Fitness Test. The results were compared with scores taken from tests given to United States boys and girls. The British were far superior to the United States youth in every test except the softball throw. Campbell stated: "The unfit condition of the U. S. youth is serious as indicated in this study. The physical fitness of a nation is definitely not displayed in the showing of its Olympic team, nor by its economic stature, but by what its individuals can do, and the U. S. youth certainly does not display good physical fitness when looked at from these criteria" (20:3).

With a knowledge of the child's fitness as the logical starting point for conducting effective physical education programs the Administrators of the Monroe School District have approved of this study to evaluate the physical fitness of the elementary school children.

Basic assumptions. This study was preceded with the basic assumptions that (1) The Washington Elementary School Physical Fitness Test was a valid and reliable tool for testing fitness and (2) the pupils would perform to the top level of their ability on each of the items of the test battery.

Scope of the study. The study has been limited to all the elementary students in grades one through five who were enrolled in the Monroe Public Schools, Monroe, Washington, for the 1964-65 school year. This number consists of approximately 480 elementary school children.

The testing device used in this study was the Washington State Elementary School Physical Fitness Test consisting of tests that measure strength, endurance, power and speed. All tests and the classification index used for grouping the pupils have been proven as valid measuring devices of physical fitness.

Limitations of the study. The tests were administered in two different schools with the students' teachers assisting and recording the test results. This is an acknowledged limitation of the study.

II. DEFINITIONS OF TERMS USED

Physical fitness. A physically fit child is defined

as one who possesses adequate strength and vitality to carry out the duties of daily life activities, who has enough energy to meet unforseen emergencies, and who is free from disease or from handicapping defects. It includes the elements of strength, endurance, power and speed.

Norms. The norms used were established by the Washington State Elementary School Physical Fitness Test.

III. OVERVIEW OF REMAINDER OF THESIS

The next chapter of this study presents a brief historical sketch of the development of measurement in physical education, including the Washington State Elementary Physical Fitness Test that was used in this study and reference to several related research studies. Chapter three contains the procedure of the investigation through the use of the Washington State Elementary Physical Fitness Test. Chapter four is an analysis of the data and the statistical review.

Summaries, conclusions, and recommendations are included in the final chapter.

CHAPTER II

REVIEW OF THE LITERATURE

I. HISTORY OF PHYSICAL MEASUREMENT

Measurement in physical education can be traced far back into the period of time before Christ. Throughout recorded history, until the last thirty year period, measurement was concerned largely with the study of the body with little importance attached to physical ability.

Objective measurement in the United States was started by Dr. Edward Hitchcock of Amherst in 1861. The first head of an established physical education department, his goal was to place physical education on a scientific basis. Hitchcock's contribution was mainly anthropometric. Measurement to follow passed through several overlapping stages and was not clearly defined. These stages were:

1. Anthropometric (1860-1880)
2. Strength testing (1880-1915)
3. Cardiac functional (1900-1925)
4. Athletic ability (1904-present)
5. Single test or index figure (1920-present) (4:28).

These were not successive stages of development. They merely represented different methods of attacking the problem. The dates represented the period of time when

these methods were most used by the men in the field of measurement in physical education.

Anthropometric testing. Anthropometry, or the study of the proportions of the human body, began hundreds of years ago. Sculpters in India, Rome and Greece all developed a rough sort of anthropometry in attempts to determine a common measure for all parts of the body and correct proportions for a perfect man. Later studies were made by Cacus of Germany, Zeissing of Belgium, Cromwell of England, Quetelet of France, and Reynolds of England. Each of these men made contributions in the development of anthropometry with Zeissing having made the first important investigation of physical measurement using Belgian boys as subjects in 1854 (5:19).

Efforts to evaluate outcomes in physical education in the United States have been made since 1860. Hitchcock of Amherst and Sargent of Harvard had early programs of measurement based on the use of anthropometric devices. Hitchcock's contribution consisted of extensive and careful measurement of students at Amherst. The result was a chart by which a male student could know at a glance whether he was below, above or average so far as tests and examinations will show (5:19). Sargent's contribution was much the same. He developed an anthropometric chart to determine a physical standard for the American college student where the student

could compare himself with the entire group (5:20).

Later American anthropometric studies which made contributions in physical education measurement were Brownell in 1928 with the development of a scale of thirteen silhouettes for measuring posture (18:269). Another study by Cureton and Wickens in anthropometric measurements have been found useful in determining health status of the individual through periodic measurements of age-height-weight tables according to body build. The Wetzel grid technique of evaluating physical fitness has been another method of evaluating physical fitness in our schools (5:53). It has operated upon the application of age-height-weight measure to a scaled grid with a range of channels covering all types of body build. Successive observations supplied a record indicating the progress and growth of each individual child. The grid has proven quite reliable in recording whether body development and growth of the individual was proceeding properly.

There have been many anthropometric studies not mentioned here. Anthropometry is considered an important tool in measurement and will undoubtedly be utilized a great deal in the future.

Strength testing. The shift in emphasis from body symetry and size to the measurement of the actual work of an individual occurred around 1880. Sargent played a leading

role in the change with his conclusions from tests that it was capacity not size alone which would be of the greatest practical value. His conclusion: body size and measurement of muscles alone did not furnish sufficient data upon which to base a judgment of a man's power and working capacity. This conclusion, reached after years of observation, was the dominant idea in physical education for twenty years and lasted until about 1915 (5:21).

During the 1880's Kellogg helped in developing the importance of exercise as a therapeutic measure. His work led to the invention of the Universal Dynamometer used to test the strength of many muscle groups (5:26). The greatest difficulty with this instrument for testing was its cost plus the fact that it was a stationary piece of equipment.

Larson (16:82-96) in a 1940 study developed a strength test including dips, chins, and vertical jumps. Chins and dips were muscular endurance tests using the body weight as the instrument. These tests were easily administered and have provided a better index of muscle quality and motor ability. The vertical jump was a test of the ability to develop power in relation to the body weight with the ability of the individual to utilize strength effectively the major factor. The strength test developed in this research (dips, chins, vertical jump) utilizes the element of dynamic strength and yielded a higher validity correlation,

as compared to other tests, with the criterion a measure of motor ability. The three items used in this study comprise the strength test for boys used in the Washington State Physical Fitness Test Battery for secondary schools.

Cardiac functional tests. The development of the Ergograph in 1884 by Mosso of Italy led a movement from developmental and strength testing to a more satisfactory method. Mosso was a pioneer in establishing relationship between physical condition and muscular activity and his ergograph measured the ability of the muscles to perform related to the efficiency of the circulatory system (5:23). Soon after 1890 rapid advances were made in the physiology of the heart and circulation with special emphasis upon the hygienic rather than the muscle building aspect in determining the physical condition of an individual.

Many studies in change in heart rate and arterial pressure on physical condition were made early in the 1900's to observe the general condition of a person. In one study Schneider developed a test to determine fatigue and physical condition for flying based upon relationships of pulse rate and blood pressure reclining to that standing, and also the ability to recover normal standing readings after a measured amount of exercise (18:237). Conclusions reached in these and other studies indicated that the ability to perform may

be considerably modified by physical condition. Lucian Brouha made a further contribution through development of the step test which measured the general capacity of the body, in particular the cardiovascular system, to adapt itself to hard work and to recover from what it has done (6:31-35).

Athletic ability tests. The desire for a test of speed and endurance along with strength brought about athletic ability testing. Sargent again was a pioneer in this testing area devising a test consisting of six simple exercises done for a thirty minute period without rest (5:25). However, the Normal School of Gymnastics in Milwaukee developed the first physical ability test in 1894. It was one for physical ability and classification consisting of nine events (5:25).

From 1913 on a great wave of testing spread throughout the country. In 1913 the Athletic Badge Test was established by the National Recreation Association producing a standard test on a national scale in an effort to stimulate in youth the desire to reach certain physical standards (5:91).

Athletic achievement tests have been developed in many large cities and states. New York State developed the fundamentals of motor performance test battery with tests and standards in a wide variety of athletic events for boys and in physical education skills for girls (5:97). Other state and city tests developed were based upon primary activities

of running, jumping, climbing, and throwing.

McCloy, Cozens and Brace have made important contributions in the area of athletic testing. McCloy developed a test of general physical capacity to predict potential levels an individual may be expected to attain in a wide range of physical activities (8:245). Cozens developed the general athletic ability test for college men composed of (1) baseball throw for distance, (2) football punt for distance, (3) bar snap for distance, (4) standing broad jump, (5) dodge run, and (6) parallel bar dips (8:249). This has been considered one of the outstanding tests of athletic ability. Brace developed a scale of motor ability tests which has proven valuable in classification of pupils and in furnishing a basis for evaluating achievement (8:241).

Single test or index figure. All physical fitness tests require an elaborate scoring system. It is difficult to obtain quickly a summary of ones standing without the index to show in a single figure how near to some ideal standard each student arrives upon completion of the specified test battery. Physical educators recognized the need of equalizing physical differences which exist among children of the same age. The range in size, maturity, and performance ability of children at a given age has been a problem. Factors used in equalizing the physical differences were:

age, height, and weight. Little was done in promoting homogeneous grouping prior to 1920. Most noted in developing classification indexes are Sargent, Cozens, and McCloy (17:47).

II. THE WASHINGTON STATE ELEMENTARY PHYSICAL FITNESS TEST

In 1958, Dr. Glen Kirchner developed a test battery that could be used to measure physical fitness of boys and girls of the elementary school age. The reason for developing such a rest was twofold. First, there was a need for a valid and reliable test battery that would measure strength, endurance, power, and speed among children of elementary school age. Second it was necessary to establish norms for boys and girls six to twelve years of age.

In selecting the individual elements composing the battery, Kirchner chose twenty test variables: standing broad jump, curl up, chest raising, treadmill, four count burpee, five-second run, bench push up, sit up, squat jump, bar hold-arms flexed, pull up, right leg dip, elbow flexion, elbow extension, trunk flexion, trunk extension, knee flexion, 550 yard run-or-walk, 30 yard dash, and jump reach.

The final selection of each item in the test battery was determined after twenty potential test items were tested. Only seventeen of these items were within the capabilities of elementary boys. Twelve items of the seventeen were

retained since they had a coefficient of reliability and objectivity of .75 and above.

In the final phase of the construction of the test battery, the Wherry-Doolittle test selection method was used to determine the variables for the Washington State Elementary Physical Fitness Test. The final test battery correlated .8723 with the composite external criterion. Included in the final selection was the five-second run, standing broad jump, curl-up, and squat jump. The bench push-up was added to the final selection in order to have a measurement of the strength and endurance of the arm and shoulder girdle muscles. The thirty-yard dash was substituted for the five-second run as a measure of speed. This was necessary because of the difficulty many elementary teachers found in administering the five-second run. Therefor the final test battery was composed of the standing broad jump, thirty-yard dash, bench push-up, curl-up and squat jump (20:12-14).

III. RELATED STUDIES

The author found several studies involving evaluation of physical fitness on different age levels. The following have been selected as related studies for consideration here.

Kraus and Hirschland made a study in 1954 using the Kraus-Weber test of Minimum Muscular Fitness in School Children. The test consisting of a battery of six tests

designed to measure the main muscle groups was administered to 4,264 United States school children and 2,870 European children from comparable urban and suburban communities. The results showed a startling lack of physical prowess on the part of the American school children as compared to the European children. Fifty seven and nine-tenths per cent of the United States children tested failed. Only eight and seven-tenths per cent of the European children failed (14:178-188).

The published results of this test created considerable concern on the national level and helped to promote the development of the President's Council on Youth Fitness which has been quite active.

Scruggs made a study in 1960 on the effect of participation in selected physical fitness activities on the fifth grade pupils in the Shoreline School District. The pupils were divided into seven groups with each group administered one extra calisthenic daily, different from any other group, for an eight week period in addition to the regular physical education program. The pupils were pre-tested and post-tested with the Kirchner Elementary School Physical Fitness Test to determine if any appreciable improvement in physical fitness was shown. The groups administered the "bouncing ball" exercise as the extra calisthenic showed the most improvement in total score. The extra exercise was a series of short upward springs

from the feet and hands simultaneously. The conclusion reached was that the physical education program should have a variety of activities rather than just one certain type of program (22:88).

IV. SUMMARY

Physical fitness testing has developed considerably since the early anthropometric testing by the Greeks, Romans, and Egyptians. Testing started in the United States in 1860 and continued through five successive stages of development. These test stages were: (1) anthropometric testing, (2) strength testing, (3) cardiac functional testing, (4) athletic ability testing, and (5) single test or index figure. Many physical fitness tests have been conducted in the United States in all five stages of development outlined.

CHAPTER III

PROCEDURES OF INVESTIGATION

The purpose of this study was to test all the students in grades one through five using the Washington State Elementary Physical Fitness Test and to evaluate their performance with the established norms for this test.

I. SELECTION OF TEST

Washington State Elementary Physical Fitness Test

The Washington State Elementary Physical Fitness Test was selected because (1) it is simple, inexpensive, easy to administer and reasonably free of possibilities for accidents or physical harm and (2) it was felt that the results of the study would be more meaningful if they were compared to norms established by using elementary school boys and girls from the State of Washington. This test was developed for the Washington Association for Health, Physical Education and Recreation by Glen Kirchner, Ed. D., Associate Professor of Physical Education, Eastern Washington State College, Cheney, Washington.

The test battery was designed to measure strength, endurance, power, and speed which Kirchner considered to be the basic elements of physical fitness (13:1). In order to measure these basic elements five tests were selected: (1)

standing broad jump, (2) bench push-up, (3) curl-up, (4) squat jump, and (5) thirty-yard dash. These tests are described in detail in the Physical Fitness Test Manual (13:5-9).

Standing broad jump. The purpose of this test is to measure power. The pupil assumed a squat position with his arms extended backward and with the toes of both feet parallel to and back of the starting tape. The pupil jumped forward as far as possible. The distance was measured to the nearest unit from the take-off line to the nearest heel position.

Bench push-up. The purpose of this test is to measure the strength and endurance of the forearm, the arm and the shoulder girdle muscles. The pupil assumed a front leaning rest position with the hands on the side of a chair. The pupil lowered his body until his chest touched the nearer edge of the chair and then returned to the starting position. The score was the number of push-ups completed. The pupil was stopped if he completed 50 push-ups.

Curl-up. The purpose of this test is to measure the strength and endurance of the trunk flexor muscles. The pupil assumed a back lying position with his hands behind his head. The tester held the pupil's feet close to the buttocks to insure a bent knee position. The score was the number of times the pupil sat up and touched his knees with

his chest. The pupil was stopped if he completed 50 curl-ups.

Squat jump. The purpose of this test is to measure the strength and endurance of the trunk and leg extensor muscles. The pupil would crouch and then jump to a height of approximately four inches off the mat. The arms were used to maintain balance and to absorb the shock of this jumping movement. The score was the number of times the pupil jumped the prescribed distance off the mat.

Thirty-yard dash. The purpose of this test is to measure speed. From a standing starting position the pupil ran a distance of thirty yards. The score was the time required to complete the run, recorded to the nearest five-tenths of a second.

II. ORGANIZATION OF THE TEST SITUATION

In order to administer the test to a large group it was necessary to follow the procedures suggested by Kirchner (13:1-2): (1) health status, (2) pupil orientation, (3) equipment, (4) student helpers, and (5) space requirement.

Health status. The classroom teachers were advised that only those students physically able to participate in regular physical education classes would be tested. Others were exempted from the test if they had recently missed

school because of illness.

Pupil orientation. Each child tested was oriented with all the tests prior to the testing period. This was accomplished by the classroom teachers during regular physical education classes.

Equipment. The equipment used during the testing was set up in the school gymnasiums prior to the testing period. This equipment included mats, tape, chairs, stop watch and the classroom teachers had the score sheets with the student's name and age already recorded.

Student helpers. In order to reduce the required time of the testing it was necessary to use student help. This tester used four outstanding students from his Advanced Physical Education Class in the high school. The teachers of the students being tested were used as recorders.

Space requirements. All the test items were conducted in the school gymnasiums except the thirty-yard dash which was run on the play field adjacent to the gymnasium.

III. COLLECTION OF DATA

In the spring of 1965, 456 first, second, third, fourth and fifth graders were tested in the Monroe Elementary and Intermediate school gymnasiums by the writer and student

helpers. The testing began with a complete explanation of the skills and requirements of each of the test items. Each student was told the importance of his best possible performance. Following the orientation the students went to their assigned testing stations along with their teacher who acted as recorder for her class.

Scores were determined by the tester and recorded by the teacher on a Class Score Sheet (Table I). The pupil's age and sex were necessary to convert the raw score to equivalent points in the norms. The McCall T-scale was used to transfer a child's raw score on each test item into equivalent points in a normal distribution (13:10).

IV. PUBLIC RELATIONS

Following the collection of data a letter and individual performance chart was sent to each parent that had a child involved in the testing (Tables II and III).

When the analysis of the data is completed a meeting with the Monroe Board of Directors and Administrators is planned at which time the results will be discussed in detail. It is also planned to publish the results in the School News Bulletin that goes to all teachers and parents who have children attending school in the Monroe School District.

CHAPTER IV

ANALYSIS OF DATA

In the analysis of the data each test item will be discussed separately for each grade and each sex.

I. SIX YEAR OLD BOYS

The Washington State Elementary Physical Fitness Test was administered to 13 six year old boys with the following results.

Standing broad jump. The range for the standing broad jump was from 27 inches to 49 inches. The mean for this group was 33.85 inches or a T score of 39.85 which is 1.02 σ below the norm established for the test. This indicates that 12.51% of students taking the test to establish the norms were poorer than the 6 year old boys tested at Monroe.

Bench push-ups. The range on push-ups was from 10 push-ups to 40 push-ups with a mean of 24.2 push-ups or a T score of 56.90 which is .69 σ above the norm. This indicates that 75.49% of the students tested in determining the norms were poorer than the 6 year old boys measured at Monroe.

Curl-ups. The range on the curl-up test was from 0 curl-ups to 30 curl-ups with a mean of 9.62 or a T score of

55.61 which is .56 σ above the norm. This indicates that 71.23% of the students tested in determining the norms were poorer than the 6 year old boys measured at Monroe.

Squat jump. The range on the squat jump test was from 6 to 30 with a mean of 17.46 jumps or a T score of 50.23 which is .02 σ above the norm. This indicates that 50.8% of the students tested in determining the norms were poorer than the 6 year old boys measured at Monroe.

30-yard dash. The range for the 30-yard dash was from 8 seconds to 6 seconds with a mean of 7 seconds or a T score of 46 which is .40 σ below the norm established for the test. This indicates that 34.56% of students taking the test to establish the norms were poorer than the 6 year old boys measured at Monroe.

II. SEVEN YEAR OLD BOYS

The Washington State Elementary Physical Fitness Test was administered to 50 seven year old boys with the following results.

Standing broad jump. The range for the standing broad jump was from 28 inches to 50 inches. The mean for this group was 38.36 inches or a T score of 42.32 which is .77 σ below the norm established for the test. This indicates that

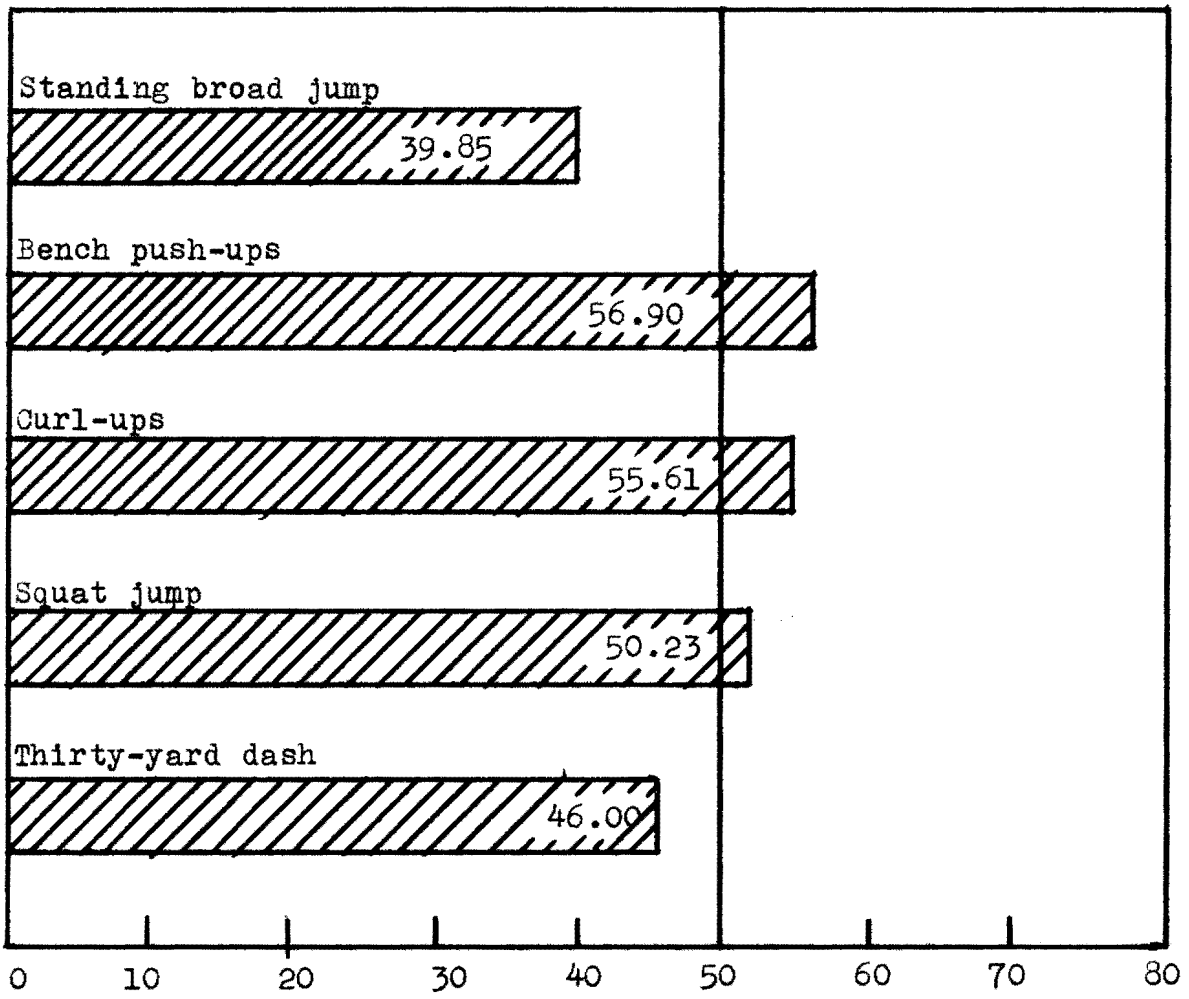

FIGURE 1

A COMPARISON OF T-SCORE MEANS OF SIX YEAR OLD BOYS AT MONROE WITH THE MEAN FOR THE WASHINGTON STATE ELEMENTARY PHYSICAL FITNESS TEST

In Figure 1 we see that the mean for six year old boys tested at Monroe was well above the mean of fifty the Washington State Elementary Physical Fitness Test in both bench push-ups and curl-ups, above average in the squat jump test, and well below the state average for the standing broad jump and thirty-yard dash.

22.06% of the students taking the test to establish the norms were poorer than the 7 year old boys tested at Monroe.

Bench push-ups. The range on push-ups was from 5 push-ups to 50 push-ups with a mean of 20.27 push-ups or a T score of 55.24 which is .52 σ above the norm. This indicates that 59.87% of the students tested in determining the norms were poorer than the 7 year old boys measured at Monroe.

Curl-ups. The range on the curl-up test was from 0 to 42 with a mean of 9.5 curl-ups or a T score of 52.5 which is .25 σ above the norm. This indicates that 59.87% of the students tested in determining the norms were poorer than the 7 year old boys measured at Monroe.

Squat jump. The range on the squat jump test was from 8 to 50 with a mean 22.43 jumps or a T score of 53.44 which is .34 σ above the norm. This indicates that 63.31% of the students tested in determining the norms were poorer than the 7 year old boys measured at Monroe.

30-yard dash. The range for the 30-yard dash was from 7.5 seconds to 6 seconds with a mean of 6.57 seconds or a T score of 47.4 which is 2.6 σ below the norm established for the test. This indicates that 39.74% of students taking the test to establish the norms were poorer than the 7 year old boys measured at Monroe.

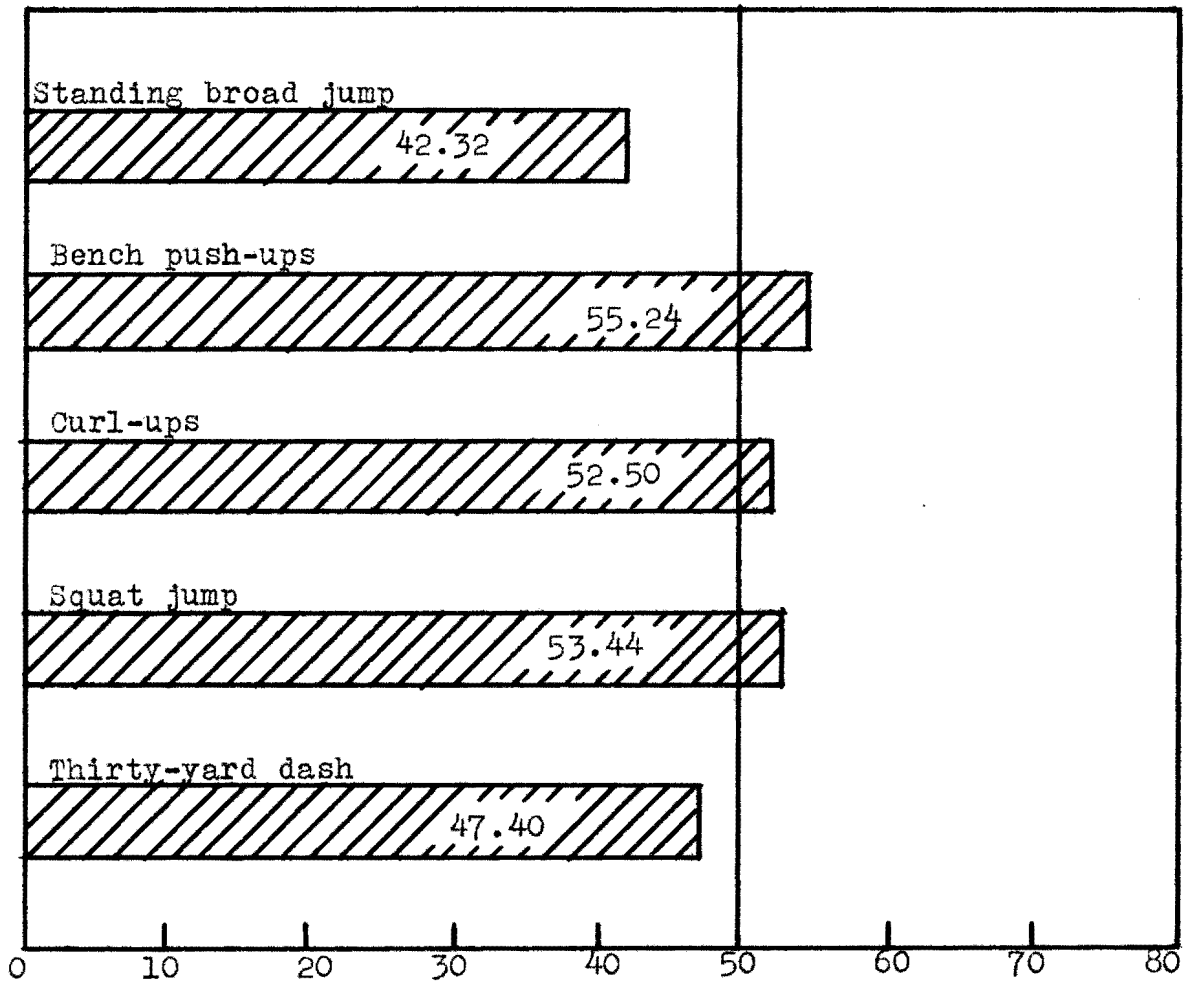

FIGURE 2

A COMPARISON OF T-SCORE MEANS OF SEVEN YEAR OLD BOYS AT MONROE WITH THE MEAN FOR THE WASHINGTON STATE ELEMENTARY PHYSICAL FITNESS TEST

In Figure 2 we see that the mean for the seven year old boys tested at Monroe was well above the mean of fifty for the Washington State Elementary Physical Fitness Test in the bench push-up test, slightly above average in the curl-up and squat jump test, below the state average for the standing broad jump and thirty-yard dash.

III. EIGHT YEAR OLD BOYS

The Washington State Elementary Physical Fitness Test was administered to 52 eight year old boys with the following results.

Standing broad jump. The range for the standing broad jump was from 30 inches to 62 inches. The mean for this group was 42.9 inches or a T score of 42.9 which is .71 σ below the norm established for the test. This indicates that 23.89% of the students taking the test to establish the norms were poorer than the 8 year old boys tested at Monroe.

Bench push-ups. The range on push-ups was from 0 push-ups to 50 push-ups with a mean of 21.49 push-ups or a T score of 58.46 which is .85 σ above the norm. This indicates that 80.23% of the students tested in determining the norms were poorer than the 8 year old boys measured at Monroe.

Curl-ups. The range on the curl-up test was from 0 curl-ups to 44 curl-ups with a mean of 14.05 or a T score of 54.06 which is .41 σ above the norm. This indicates that 65.81% of the students tested in determining the norms were poorer than the 8 year old boys measured at Monroe.

Squat jump. The range on the squat jump test was from 5 to 43 with a mean of 22.02 or a T score of 52.02 which is

.20 σ above the norm. This indicates that 58.71% of the students tested in determining the norms were poorer than the 8 year old boys measured at Monroe.

30-yard dash. The range for the 30-yard dash was from 7.5 seconds to 5 seconds or a T score of 44.35 which is .57 σ below the norm established for the test. This indicates that 28.43% of students taking the test to establish the norms were poorer than the 8 year old boys measured at Monroe.

IV. NINE YEAR OLD BOYS

The Washington State Elementary Physical Fitness Test was administered to 47 nine year old boys with the following results.

Standing broad jump. The range for the standing broad jump was from 36 inches to 62 inches. The mean for this group was 48.31 inches or a T score of 44.29 which is .57 σ below the norm established for the test. This indicates that 28.43% of students taking the test to establish the norms were poorer than the 9 year old boys tested at Monroe.

Bench push-ups. The range on push-ups was from 3 push-ups to 34 push-ups with a mean of 16.24 push-ups or a T score of 50.24 which is .02 σ above the norm. This indicates that 50.8% of the students tested in determining the norms were poorer than the 9 year old boys measured at Monroe.

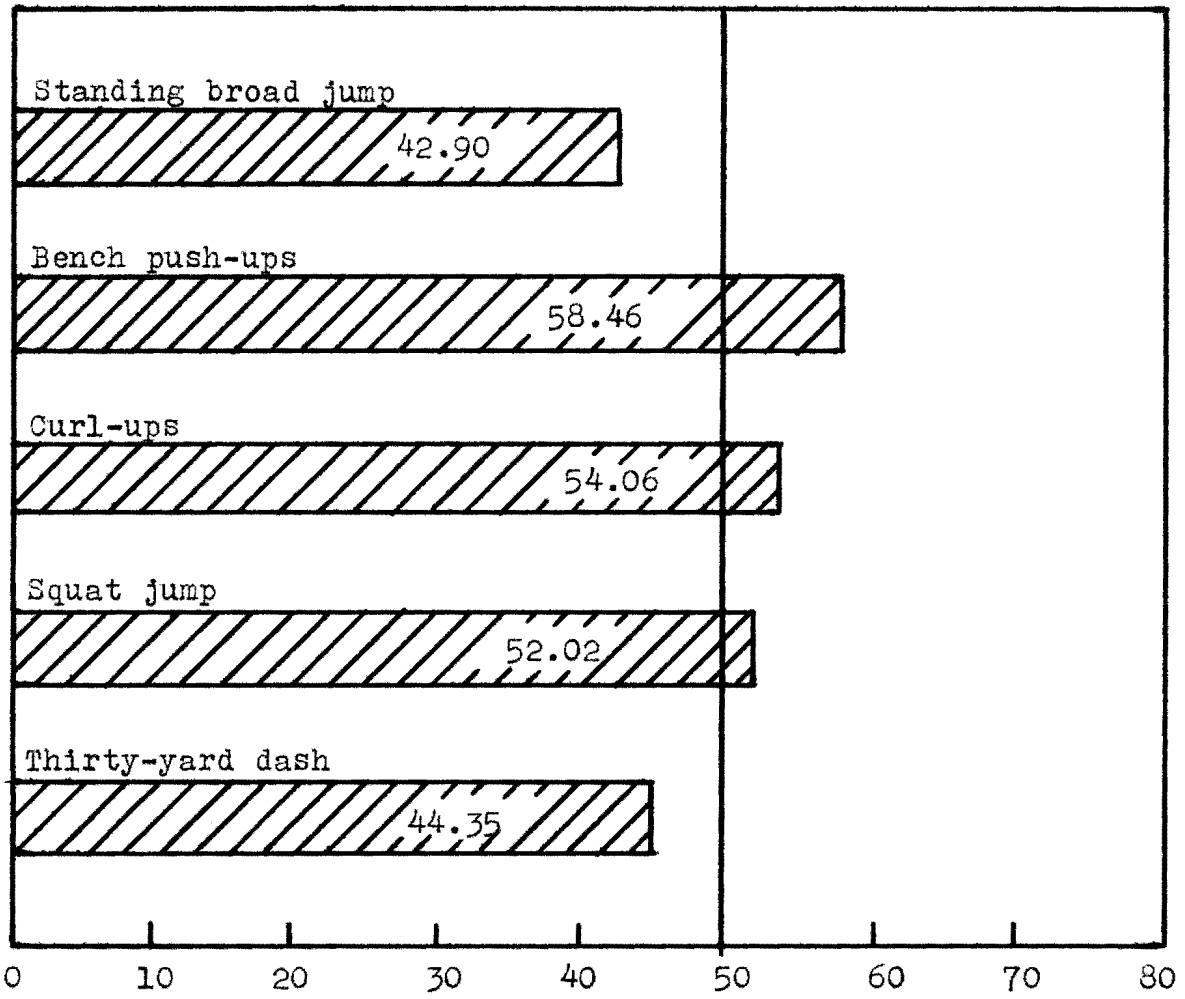

FIGURE 3

A COMPARISON OF T-SCORE MEANS OF EIGHT YEAR OLD BOYS AT MONROE WITH THE MEAN FOR THE WASHINGTON STATE ELEMENTARY PHYSICAL FITNESS TEST

In Figure 3 we see that the mean for the eight year old boys tested at Monroe was well above the mean of fifty for the Washington State Elementary Physical Fitness Test in both bench push-ups and curl-ups, slightly above average for the squat jump test, and well below the state average in both standing broad jump and the thirty-yard dash.

Curl-ups. The range on the curl-up test was from 0 curl-ups to 50 curl-ups with a mean of 12.59 or a T score of 49.59 which is .41σ below the norm established for the test. This indicates that 48.4% of those tested to establish the norms were poorer than the 9 year old boys measured at Monroe.

Squat jump. The range on the squat jump test was from 1 to 49 with a mean of 16.87 jumps or a T score of 44.89 which is .51σ below the norm for the test. This indicates that 30.5% of students taking the test to establish the norms were poorer than the 9 year old boys measured at Monroe.

30-yard dash. The range for the 30-yard dash was from 6.5 seconds to 4.5 seconds with a mean of 5.78 seconds or a T score of 46.34 which is .38σ below the norm established for the test. This indicates that 35.57% of students taking the test to establish the norms were poorer than the 9 year old boys tested at Monroe.

V. TEN YEAR OLD BOYS

The Washington State Elementary Physical Fitness Test was administered to 40 ten year old boys with the following results.

Standing broad jump. The range for the standing broad jump was from 32 inches to 72 inches. The mean for the group

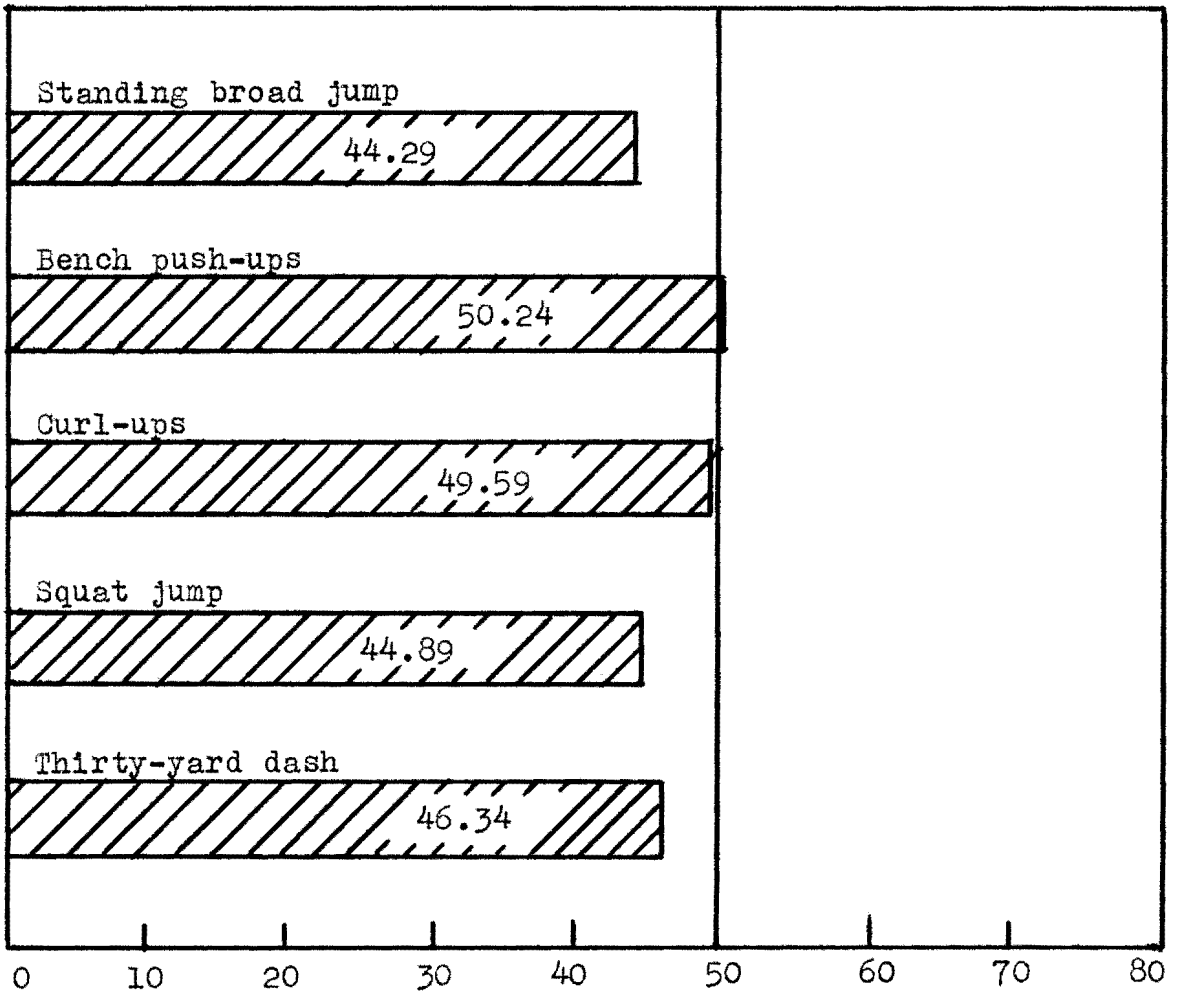

FIGURE 4

A COMPARISON OF T-SCORE MEANS OF NINE YEAR OLD BOYS AT MONROE WITH THE MEAN FOR THE WASHINGTON STATE ELEMENTARY PHYSICAL FITNESS TEST

In Figure 4 we see that the mean for the nine year old boys tested at Monroe was well below the mean of fifty for the Washington State Elementary Physical Fitness Test for both the standing broad jump and the squat jump test, slightly below the state average for the thirty-yard dash and curl-up test and slightly above the mean for the bench push-up test.

was 57.82 inches or a T score of 52.8 which is .28 σ above the norm. This indicates that 61.03% of students tested to determine the norms were poorer than the 10 year old boys tested at Monroe.

Bench push-ups. The range for push-ups was from 6 push-ups to 41 push-ups. The mean was 18.87 push-ups or a T score of 52.9 which is .29 σ above the norm. This indicates that 61.41% of the students tested in determining the norms were poorer than the 10 year old boys tested at Monroe.

Curl-ups. The range on the curl-up test was from 5 to 48 curl-ups. The mean was 21.35 curl-ups or a T score of 54.38 which is .44 σ above the norm. This indicates that 67% of those tested to establish the norms were poorer than the 10 year old boys tested in Monroe.

Squat jump. The range on the squat jump test was from 4 jumps to 45 jumps. The mean was 19.28 or a T score of 48.28 which is .17 σ below the norm for the test. This indicates that 43.25% of students tested to establish the norms were poorer than the 10 year old boys tested at Monroe.

30-yard dash. The range for the 30-yard dash was from 6.5 seconds to 4.0 seconds. The mean for this test was 5.73 seconds or a T score of 45.65 which is .44 σ below the norm established for the test. This indicates that 33% of students

taking this test to establish the norms were poorer than the 10 year old boys tested at Monroe.

VI. ELEVEN YEAR OLD BOYS

The Washington State Elementary Physical Fitness Test was administered to 36 eleven year old boys with the following results.

Standing broad jump. The range for the standing broad jump was from 44 inches to 74 inches. The mean was 62.29 inches or a T score of 56.19 which is .62σ above the norm. This indicates that 72.24% of the students tested to determine the norms were poorer than the 11 year old boys tested at Monroe.

Bench push-ups. The range for push-ups was from 1 push-up to 40 push-ups. The mean was 16.86 push-ups or a T score of 50.8 which is .08σ above the norm. This indicates that 53.19% of the students tested in determining the norms were poorer than the 11 year old boys tested at Monroe.

Curl-ups. The range on the curl-up test was from 7 to 49 curl-ups. The mean was 23.08 curl-ups or a T score of 53.08 which is .31σ above the norm. This indicates that 64.8% of those tested to establish the norms were poorer than the 11 year old boys measured at Monroe.

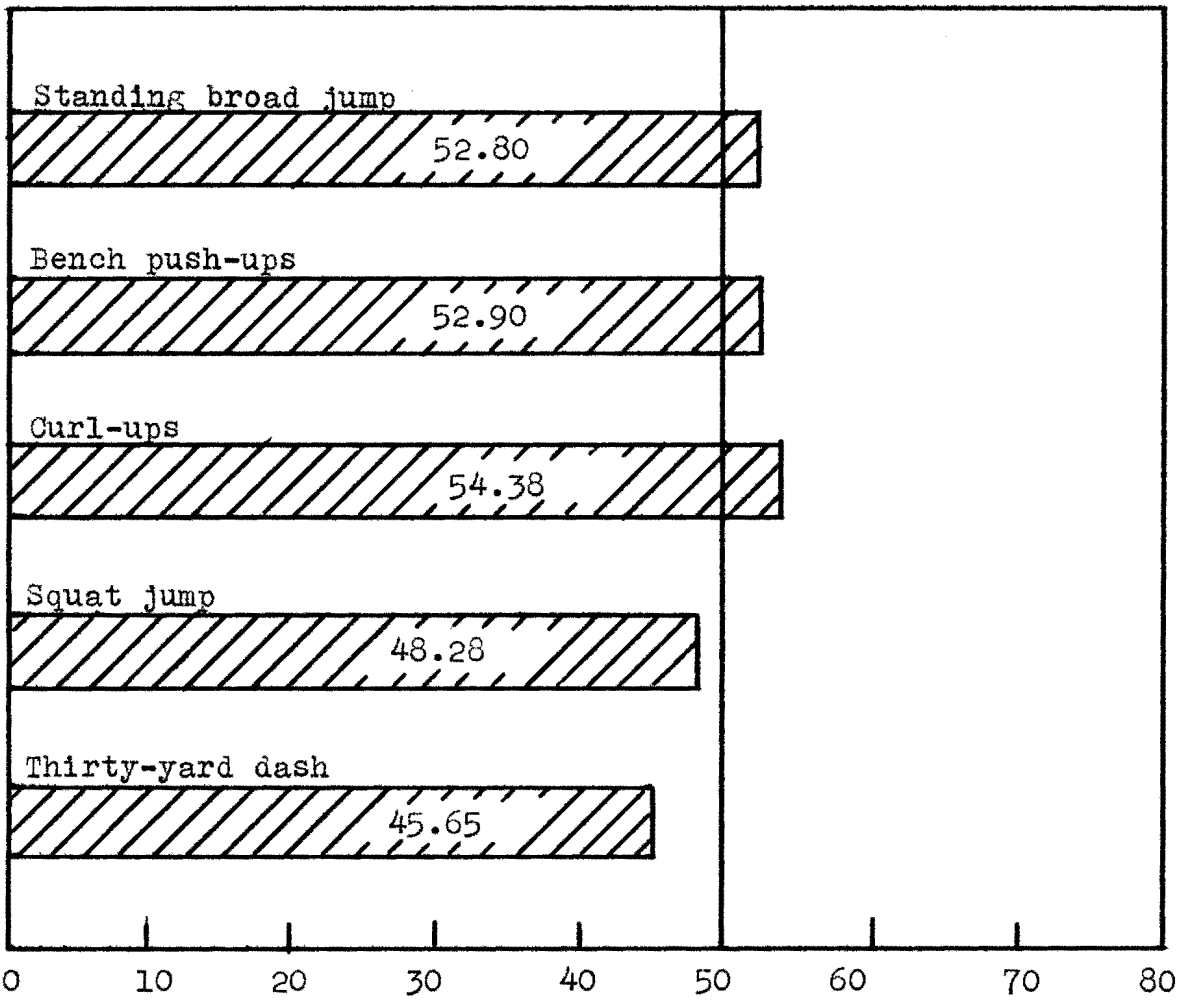

FIGURE 5

A COMPARISON OF T-SCORE MEANS OF TEN YEAR OLD BOYS AT MONROE WITH THE MEAN FOR THE WASHINGTON STATE ELEMENTARY PHYSICAL FITNESS TEST

In Figure 5 we see that the mean for the ten year old boys tested at Monroe was well above the mean of fifty for the Washington State Elementary Physical Fitness Test in the curl-up test, slightly above the norm for the standing broad jump and bench push-up test, and below the state average for both the squat jump test and the thirty-yard dash.

Squat jump. The range on the squat jump test was from 4 jumps to 41 jumps. The mean was 17.3 jumps or a T score of 44.3 which is .57σ below the norm for the test. This indicates that 28.43% of students tested to establish the norms were poorer than the 11 year old boys tested at Monroe.

30-yard dash. The range for the 30-yard dash was from 6.5 seconds to 4.5 seconds. The mean for this test was 5.29 seconds or a T score of 49.47 which is .05σ below the norm established for the test. This indicates that 48.01% of students taking the test to establish the norms were poorer than the 11 year old boys tested at Monroe.

VII. SIX YEAR OLD GIRLS

The Washington State Elementary Physical Fitness Test was administered to 38 six year old girls with the following results.

Standing broad jump. The range for the standing broad jump was from 13 inches to 45 inches. The mean was 29.87 inches or a T score of 35.89 which is 1.41σ below the established norm for the test. This indicates that 7.93% of the students taking the test to establish the norms were poorer than the 6 year old girls measured at Monroe.

Bench push-ups. The range for the push-up test was

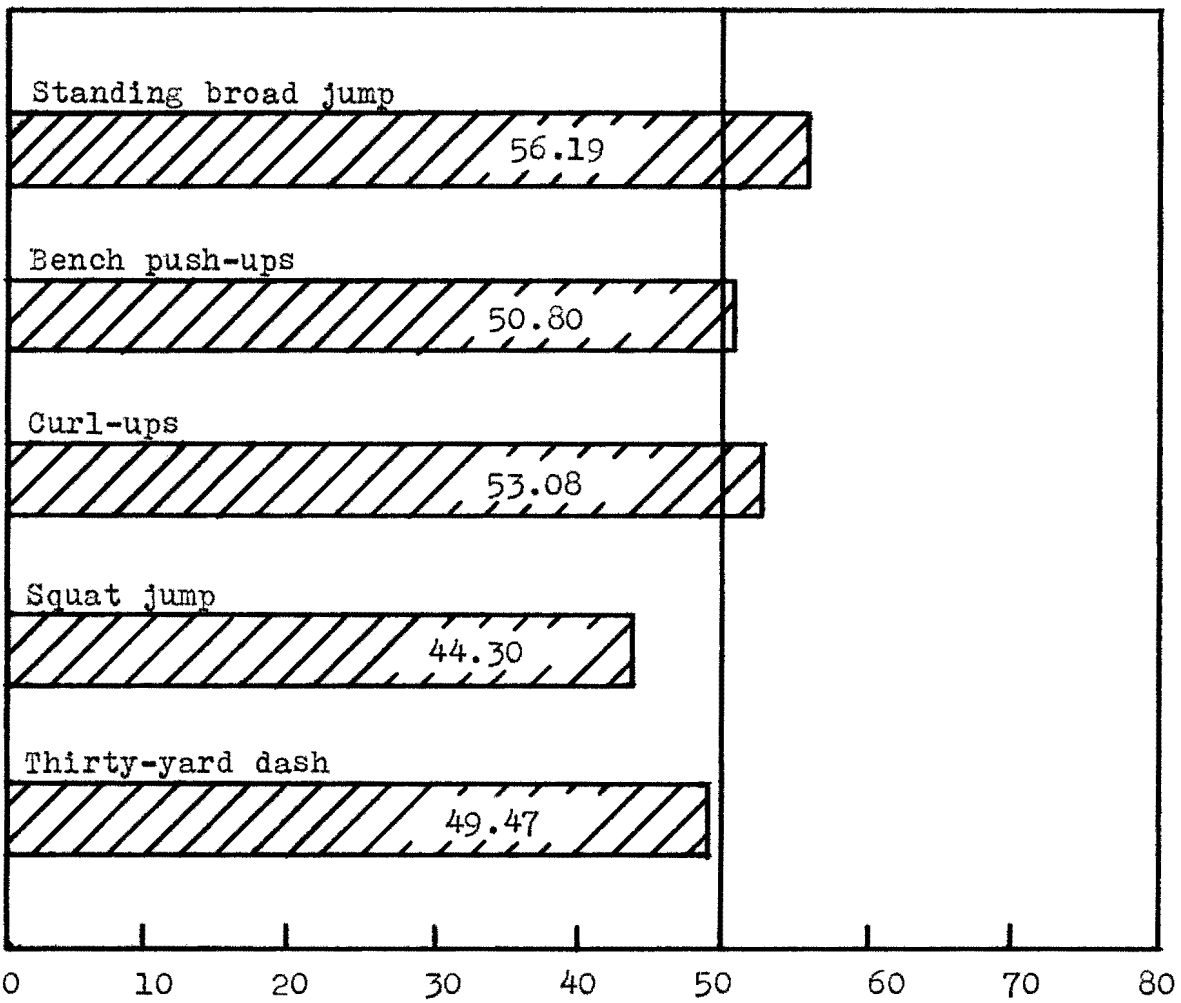

FIGURE 6

A COMPARISON OF T-SCORE MEANS OF ELEVEN YEAR OLD BOYS AT MONROE WITH THE MEAN FOR THE WASHINGTON STATE ELEMENTARY PHYSICAL FITNESS TEST

In Figure 6 we see that the mean for the eleven year old boys tested at Monroe was well above the mean of fifty for the Washington State Elementary Physical Fitness Test in the standing broad jump, slightly above the norm for the curl-up and bench push tests and below the state average for both the squat jump and the thirty-yard dash.

from 4 push-ups to 26 push-ups. The mean for this test was 12.76 which is a T score of 55.82 which is .58 σ above the norm. This indicates that 71.9% of those tested in determining the norms were poorer than the 6 year old girls measured at Monroe.

Curl-ups. The range on the curl-up test was from 0 curl-ups to 24 curl-ups. The mean for the test was 10.43 curl-ups which is a T score of 55.21 which is .52 σ above the norm. This indicates that 56.43% of those tested in determining the norms were poorer than the 6 year old girls tested at Monroe.

Squat jump. The range on the squat jump test was from 9 jumps to 28 jumps. The mean for the test was 18.96 which is a T score of 53.71 which is .37 σ above the norm. This indicates that 64.43% of those tested in establishing the norms were poorer than the 6 year old girls tested at Monroe.

30-yard dash. The range on the 30-yard dash was from 8.5 seconds to 6 seconds. The mean for the test was 7.29 seconds or a T score of 45.03 which is .47 σ below the norm established for the test. This indicates that 31.92% of the students taking the test to establish the norms were poorer than the 6 year old girls measured at Monroe.

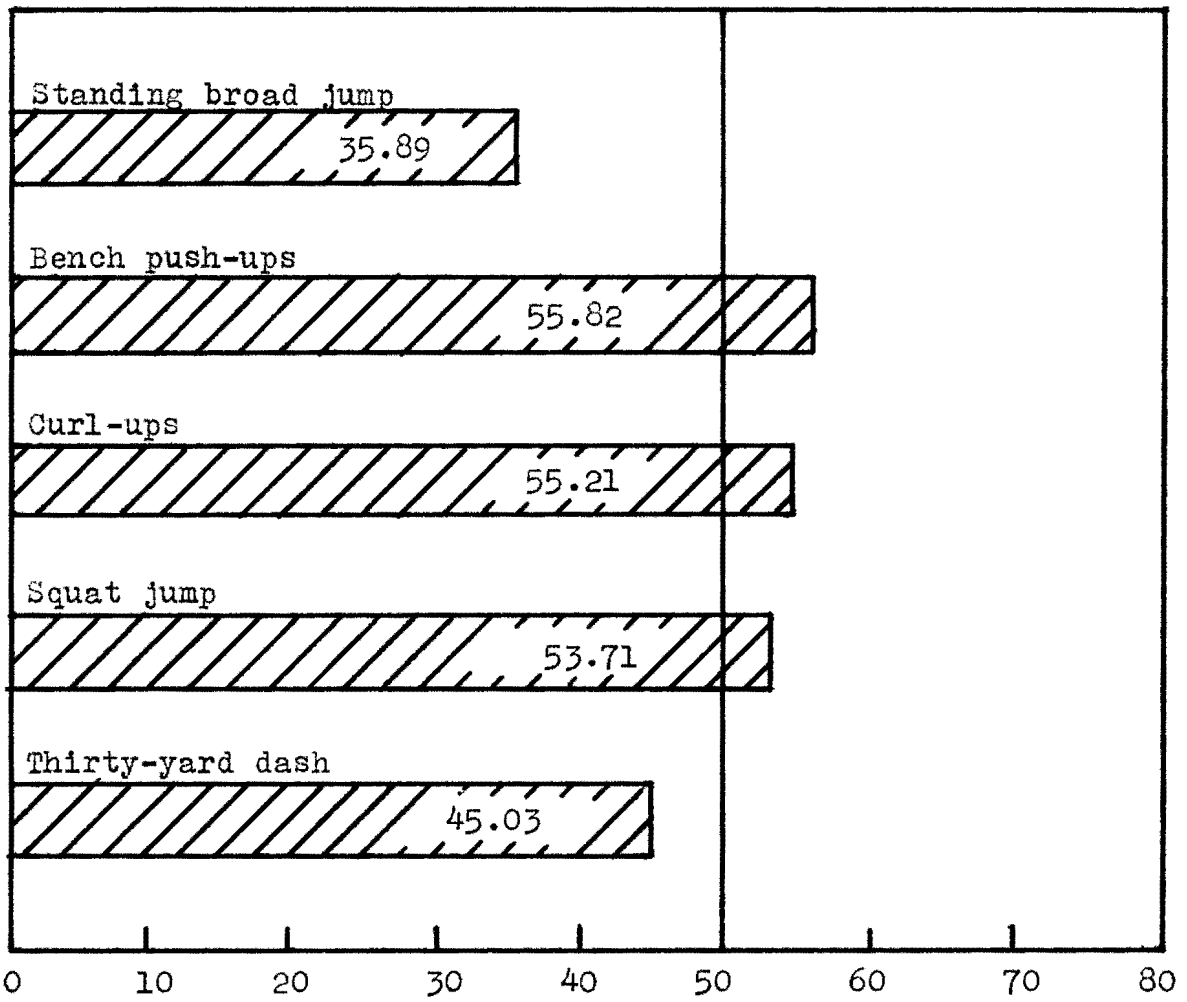

FIGURE 7

A COMPARISON OF T-SCORE MEANS OF SIX YEAR OLD GIRLS AT MONROE WITH THE MEAN FOR THE WASHINGTON STATE ELEMENTARY PHYSICAL FITNESS TEST

In Figure 7 we see that the mean for the six year old girls tested at Monroe was well above the mean of fifty for the Washington State Elementary Physical Fitness Test in both bench push-ups and curl-ups, slightly above average in the squat jump test and well below the state average for the standing broad jump and thirty-yard dash.

VIII. SEVEN YEAR OLD GIRLS

The Washington State Elementary Physical Fitness Test was administered to 40 seven year old girls with the following results.

Standing broad jump. The range for the standing broad jump was from 23 inches to 53 inches. The mean for the test was 38.5 inches or a T score of 40.19 which is .81 σ below the established norm for the test. This indicates that 20.9% of the students taking the test to establish the norms were poorer than the 7 year old girls measured at Monroe.

Bench push-ups. The range for the push-up test was from 5 push-ups to 50 push-ups. The mean for the test was 16.1 push-ups which is a T score of 57.38 which is .74 σ above the norm. This indicates that 77.04% of students taking the test to establish the norms were poorer than the 7 year old girls tested at Monroe.

Curl-ups. The range on the curl-up test was from 0 to 50 curl-ups. The mean for this test was 13.23 curl-ups which is a T score of 57.09 which is .71 σ above the norm. This indicates that 76.11% of those tested in determining the norms were poorer than the 7 year old girls measured at Monroe.

Squat jump. The range on the squat jump test was from

23 to 53 jumps. The mean for the test was 38.5 inches which is a T score of 57.23 which is .73σ above the norm. This indicates that 76.73% of those tested in establishing the norms were poorer than the 7 year old girls tested at Monroe.

30-yard dash. The range on the 30-yard dash was from 8.5 seconds to 6 seconds. The mean for the test was 7.05 seconds or a T score of 44.9 which is .51σ below the norm established for the test. This indicates that 30.5% of the students taking the test to establish the norms were poorer than the 7 year old girls measured at Monroe.

IX. EIGHT YEAR OLD GIRLS

The Washington State Elementary Physical Fitness Test was administered to 42 eight year old girls with the following results.

Standing broad jump. The range for the standing broad jump was from 28 inches to 51 inches. The mean for this test was 43.69 inches or a T score of 40.62 which is .94σ below the established norm for the test. This indicates that 17.36% of the students taking the test to establish the norms were poorer than the 8 year old girls tested at Monroe.

Bench push-ups. The range for the push-up test was from 0 push-ups to 45 push-ups. The mean for this test was

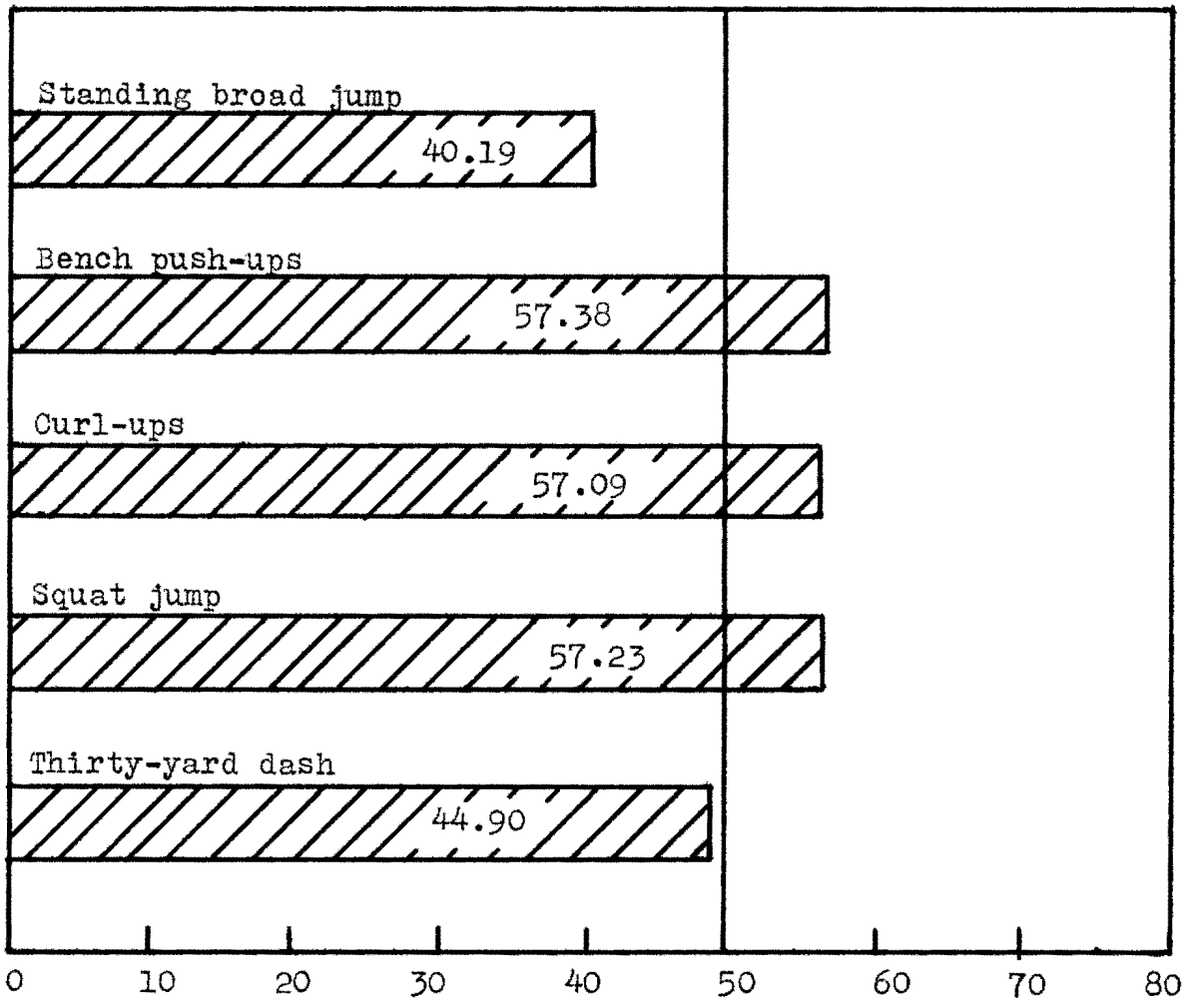

FIGURE 8

A COMPARISON OF T-SCORE MEANS OF SEVEN YEAR OLD GIRLS AT MONROE WITH THE MEAN FOR THE WASHINGTON STATE ELEMENTARY PHYSICAL FITNESS TEST

In Figure 8 we see that the mean for the seven year old girls tested at Monroe was well above the mean of fifty for the Washington State Elementary Physical Fitness Test in bench push-ups, curl-ups and squat jump. The mean for both the standing broad jump and thirty-yard dash was well below the state average.

15.33 which is a T score of 56.33 which is .63 σ above the norm. This indicates that 73.57% of those tested in determining the norms were poorer than the 8 year old girls tested at Monroe.

Curl-ups. The range on the curl-up test was from 0 curl-ups to 49 curl-ups. The mean for this test was 14.05 curl-ups which is a T score of 50.23 which is .02 σ above the norm. This indicates that 50.8% of those tested in determining the norms were poorer than the 8 year old girls tested at Monroe.

Squat jump. The range on the squat jump test was from 4 jumps to 44 jumps. The mean for the test was 18.57 jumps which is a T score of 51.02 which is .1 σ above the norm. This indicates that 53.98% of those tested in establishing the norms were poorer than the 8 year old girls tested at Monroe.

30-yard dash. The range on the 30-yard dash was from 7 seconds to 5.5 seconds. The mean for the test was 6.39 seconds or a T score of 44.59 which is .55 σ below the norm established for the test. This indicates that 29.12% of the students taking the test to establish the norms were poorer than the 8 year old girls measured at Monroe.

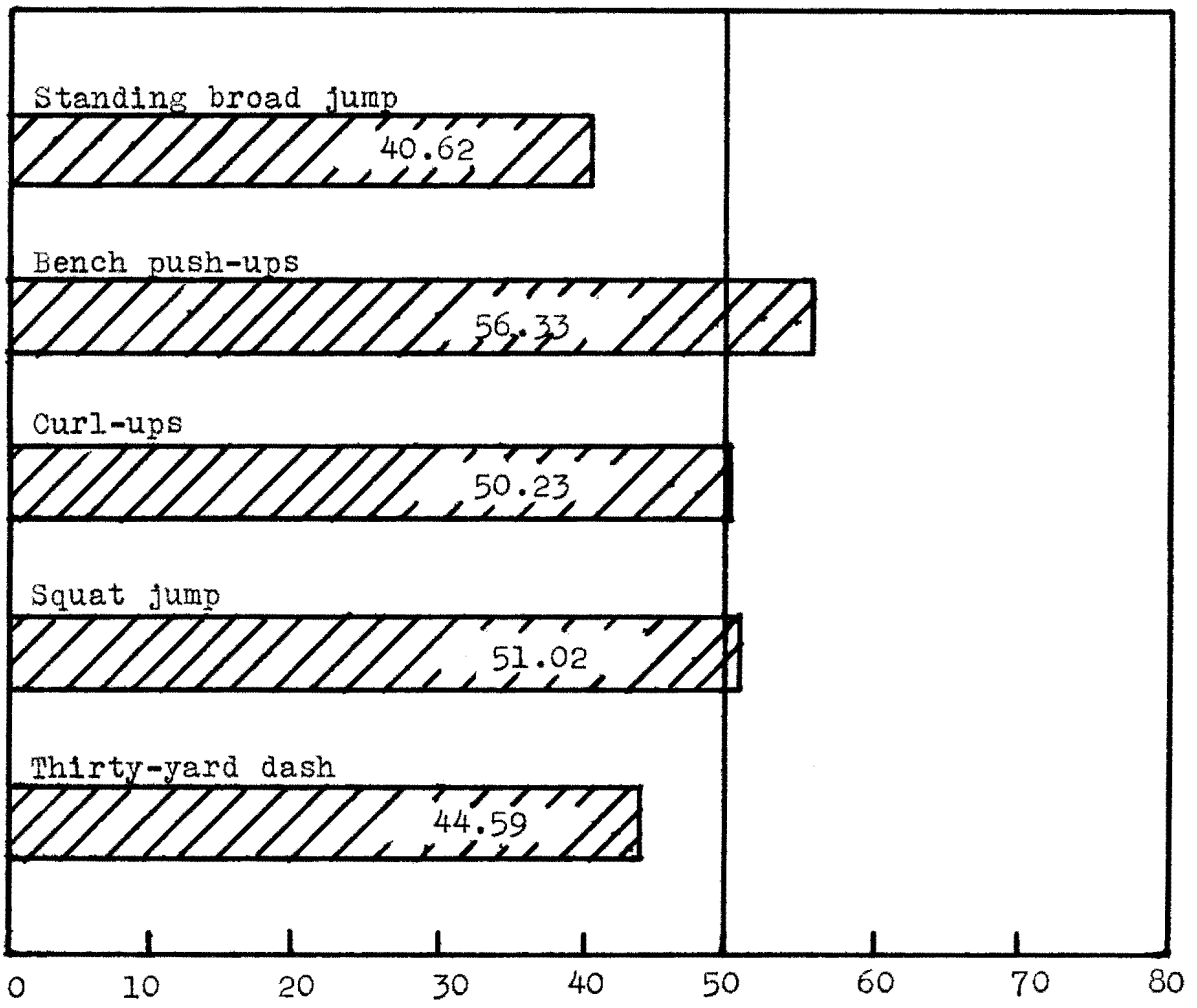

FIGURE 9

A COMPARISON OF T-SCORE MEANS OF EIGHT YEAR OLD GIRLS AT MONROE WITH THE MEAN FOR THE WASHINGTON STATE ELEMENTARY PHYSICAL FITNESS TEST

In Figure 9 we see that the mean for the eight year old girls tested at Monroe was well above the mean of fifty for the Washington State Elementary Physical Fitness Test in the bench push-up test, slightly above the state average in both the curl-up and squat jump test, and well below the state average in the standing broad jump and thirty-yard dash.

X. NINE YEAR OLD GIRLS

The Washington State Elementary Physical Fitness Test was administered to 41 nine year old girls with the following results.

Standing broad jump. The range for the standing broad jump was from 27 inches to 58 inches. The mean was 44.43 inches or a T score of 48.49 which is .15 σ below the established norm for the test. This indicates that 44.04% of the students taking the test to establish the norms were poorer than the 9 year old girls tested at Monroe.

Bench push-ups. The range for the push-up test was from 3 push-ups to 38 push-ups. The mean for this test was 14.27 push-ups which is a T score of 53.23 which is .32 σ above the norm. This indicates that 62.55% of those tested in determining the norms were poorer than the 9 year old girls tested at Monroe.

Curl-ups. The range on the curl-up test was from 0 curl-ups to 39 curl-ups. The mean for this test was 12.24 curl-ups which is a T score of 50.49 which is .05 σ above the norm. This indicates that 51.99% of those tested in determining the norms were poorer than the 9 year old girls tested at Monroe.

Squat jumps. The range on the squat jump test was from 6 jumps to 35 jumps. The mean for the test was 20.57 which is a T score of 49.56 which is .05 σ below the established norm for the test. This indicates that 48.01% of students taking the test to establish the norms were poorer than the 9 year old girls measured at Monroe.

30-yard dash. The range on the 30-yard dash was from 6.5 seconds to 5 seconds. The mean for the test was 5.84 seconds or a T score of 46.34 which is .38 σ below the norm established for the test. This indicates that 35.2% of the students tested to establish the norms were poorer than the 9 year old girls measured at Monroe.

XI. TEN YEAR OLD GIRLS

The Washington State Elementary Physical Fitness Test was administered to 42 ten year old girls with the following results.

Standing broad jump. The range for the standing broad jump was from 39 inches to 67 inches. The mean was 51.79 inches or a T score of 51.55 which is .16 σ above the norm. This indicates that 56.36% of those tested in determining the norms were poorer than the 10 year old girls measured at Monroe.

Bench push-ups. The range on the push-up test was

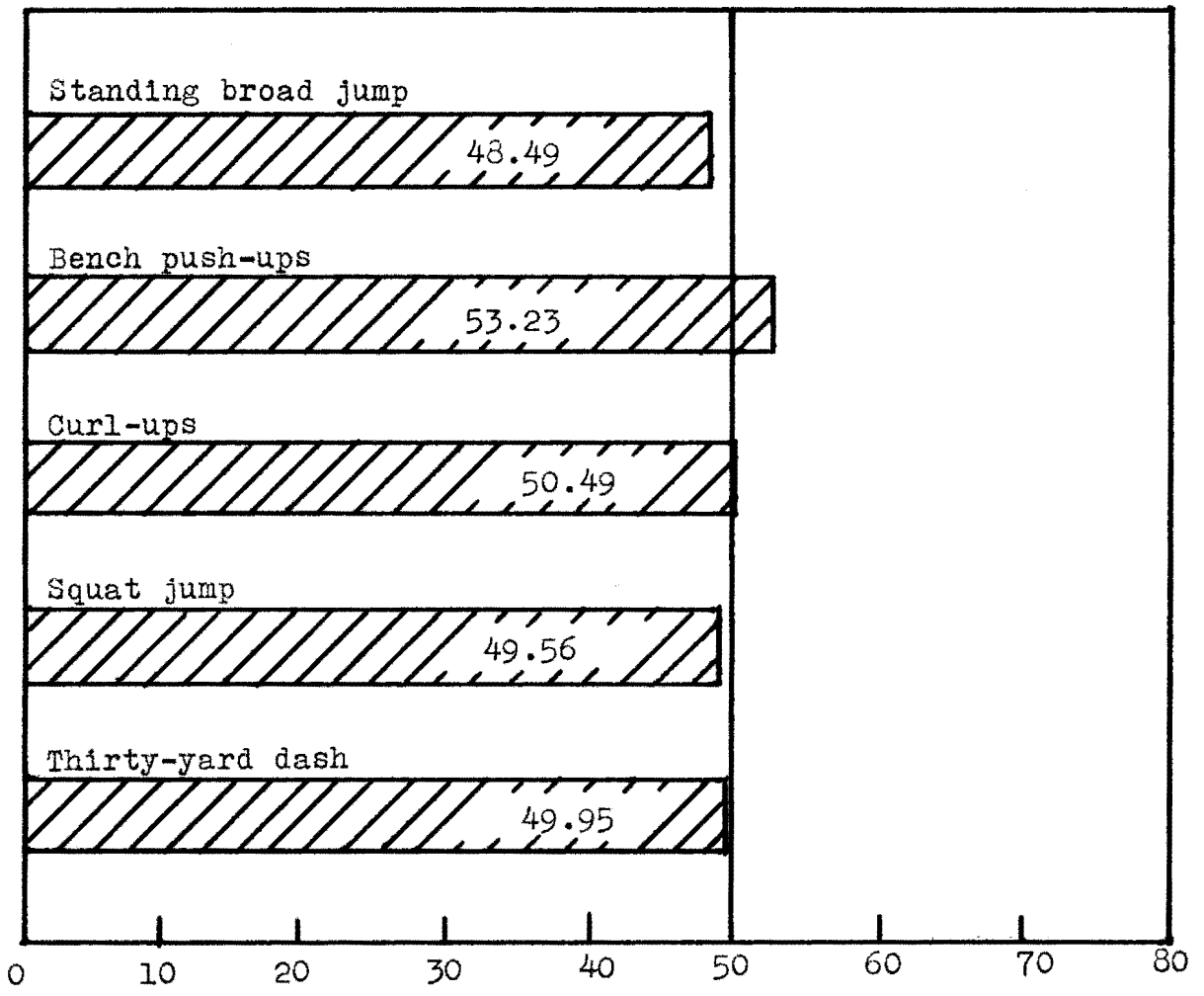

FIGURE 10

A COMPARISON OF T-SCORE MEANS OF NINE YEAR OLD GIRLS AT MONROE WITH THE MEAN FOR THE WASHINGTON STATE ELEMENTARY PHYSICAL FITNESS TEST

In Figure 10 we see that the mean for the nine year old girls tested at Monroe was slightly above the mean of fifty for the Washington State Elementary Physical Fitness Test in both the curl-up test and bench push-up test and just below the state average in the standing broad jump, squat jump, and the thirty-yard dash.

from 0 push-ups to 35 push-ups. The mean for the test was 11.59 push-ups which is a T score of 52.55 which is .26 σ above the norm. This indicates that 60.26% of the students tested in determining the norms were poorer than the 10 year old girls measured at Monroe.

Curl-ups. The range on the curl-up test was from 0 to 50 curl-ups. The mean for the test was 19.86 or a T score of 52.9 which is 2.9 σ above the norm. This indicates that 61.41% of the students tested in determining the norms were poorer than the 10 year old girls measured at Monroe.

Squat jump. The range on the squat jump test was from 5 jumps to 34 jumps. The mean for the test was 18.37 jumps or a T score of 48.33 which is .18 σ below the norm for the test. This indicates that 43.25% of students taking the test to establish the norms were poorer than the 10 year old girls measured at Monroe.

30-yard dash. The range for the 30-yard dash was from 6.5 seconds to 4.5 seconds. The mean for the test was 5.87 seconds or a T score of 53.4 which is .34 σ above the norm for the test. This indicates that 63.31% of students taking the test to establish the norms were poorer than the 10 year old girls measured at Monroe.

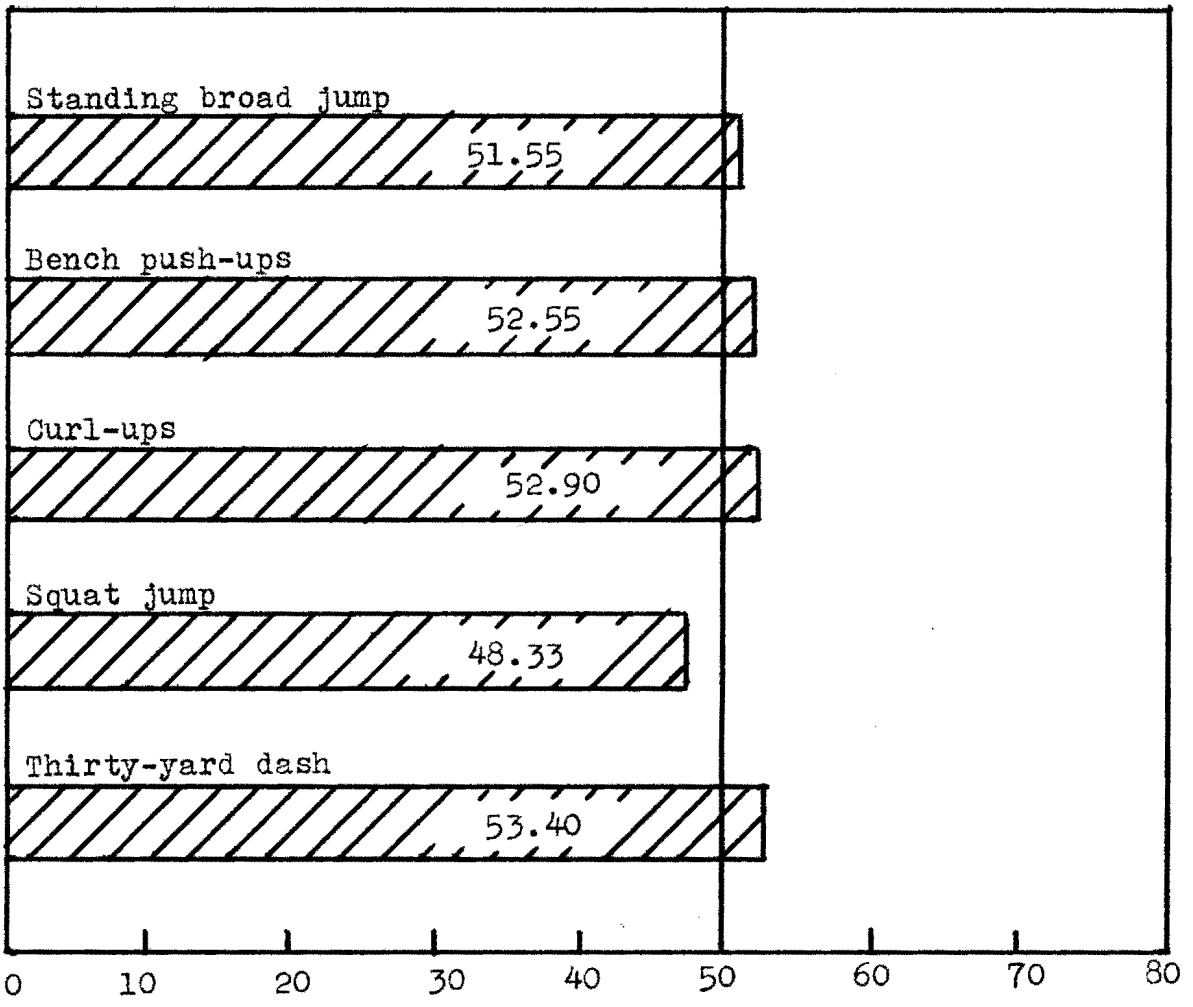

FIGURE 11

A COMPARISON OF T-SCORE MEANS OF TEN YEAR OLD GIRLS AT MONROE WITH THE MEAN FOR THE WASHINGTON STATE ELEMENTARY PHYSICAL FITNESS TEST

In Figure 11 we see that the mean for the ten year old girls tested at Monroe was slightly above the mean of fifty for the Washington State Elementary Physical Fitness Test in the standing broad jump, bench push-ups, curl-ups, and thirty-yard dash and slightly below the state average in the squat jump test.

XII. ELEVEN YEAR OLD GIRLS

The Washington State Elementary Physical Fitness Test was administered to 25 eleven year old girls with the following results.

Standing broad jump. The range for the standing broad jump was from 45 inches to 70 inches. The mean for the test was 58.07 or a T score of 54.04 which is .40 σ above the norm for the test. This indicates that 65.54 of students taking the test to establish the norms were poorer than the 11 year old girls tested at Monroe.

Bench push-ups. The range on the push-up test was from 2 push-ups to 27 push-ups. The mean for the test was 10.91 push-ups or a T score of 52.8 which is .28 σ above the norm for the test. This indicates that 61.03% of the students tested in determining the norms were poorer than the 11 year old girls measured at Monroe.

Curl-ups. The range on the curl-up test was from 0 to 46 curl-ups. The mean for the test was 14.73 or a T score of 45.72 which is .43 σ below the norm for the test. This indicates that 33.36% of the students taking the test to establish the norms were poorer than the 11 year old girls tested at Monroe.

Squat jump. The range on the squat jump test was from 0 jumps to 34 jumps. The mean for the test was 15.39 jumps or a T score of 44.36 which is .56 σ below the norm for the test. This indicates that 28.43% of students taking the test to establish the norms were poorer than the 11 year old girls tested at Monroe.

30-yard dash. The range for the 30-yard dash was from 6.5 seconds to 4.0 seconds. The mean for the test was 5.47 seconds or a T score of 48.32 which is .17 σ below the established norm for the test. This indicates that 43.25% of students taking the test to establish the norms were poorer than the 11 year old girls measured at Monroe.

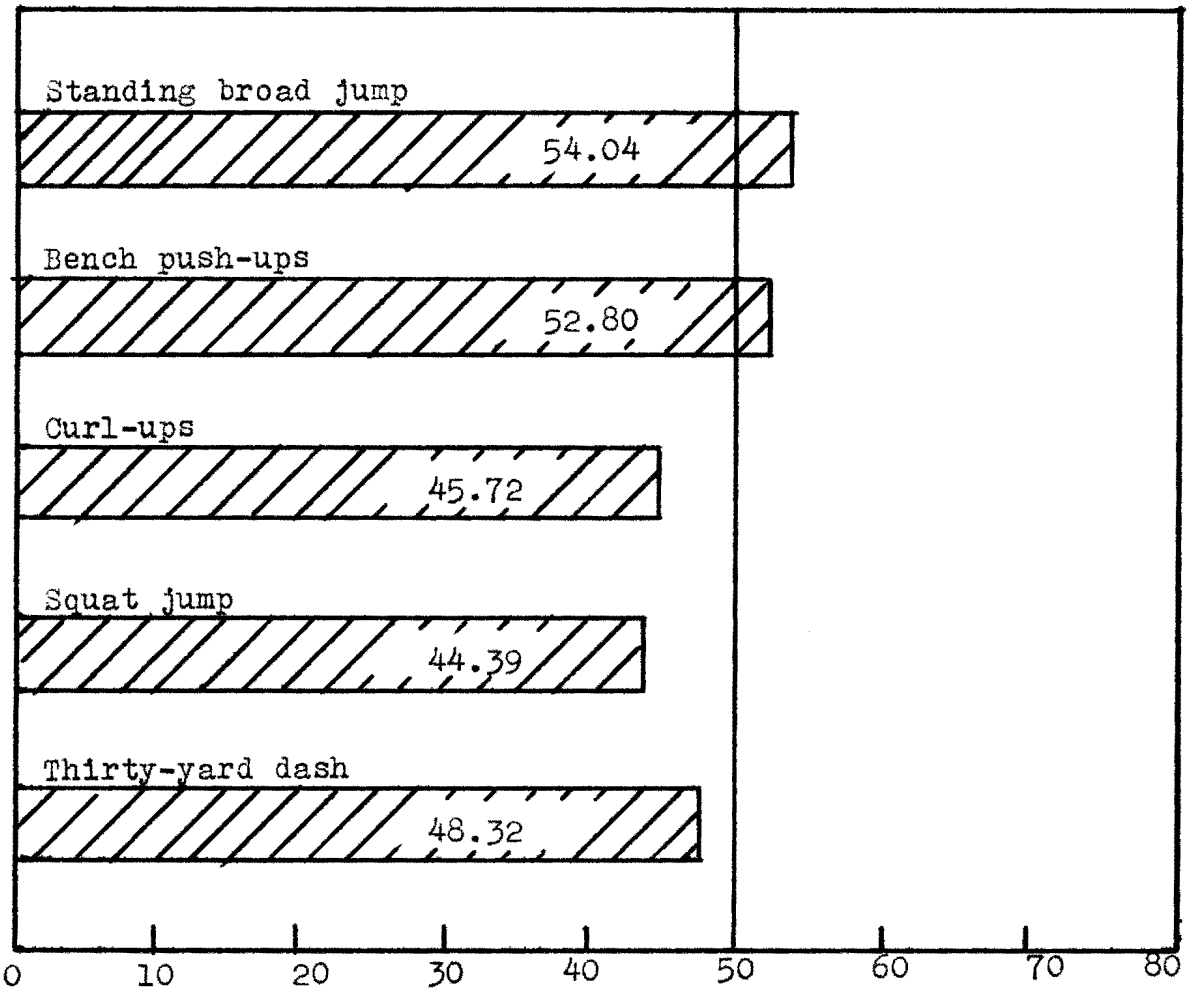

FIGURE 12

A COMPARISON OF T-SCORE MEANS OF ELEVEN YEAR OLD GIRLS AT MONROE WITH THE MEAN FOR THE WASHINGTON STATE ELEMENTARY PHYSICAL FITNESS TEST

In Figure 12 we see that the mean for the eleven year old girls tested at Monroe was slightly above the mean of fifty for the Washington State Elementary Physical Fitness Test in both the standing broad jump and bench push-ups, in the curl-up and squat jump tests they were well below the state average, and slightly below the state average in the thirty-yard dash.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

I. SUMMARY

The purpose of this study was to evaluate the physical fitness of the elementary students at Monroe, Washington. The Washington State Elementary Physical Fitness Test was administered to the 456 students enrolled in Frank Wagner and Central Elementary Schools in the spring of 1965.

The results were reported separately for both boys and girls according to their age. The range, mean, and standard deviation were computed for each test in the test battery. Using these computations a percent analysis was done for each age and sex showing the percent of students that were tested to establish the norms for the Washington State Physical Fitness Test that scored lower than students of the same age and sex that were tested at Monroe, Washington.

II. CONCLUSIONS

The statistical data indicated a need for more emphasis on the development of certain elements of physical fitness. This is especially true in the area of muscular strength and endurance where the tests indicated a marked decrease in T scores by the older students.

In the bench push-up test the eleven year old boys had a mean T score of 50.8 compared to the six and seven year old boys with 56.9 and 55.24 respectively. In the curl-up test, which measures abdominal strength and endurance, there was a drop in T score means by both boys and girls especially by the eleven year old girls. They had a T score mean of 45.72 compared to the six year old girls 55.21 and the seven year old girls 57.09. There was a similar drop in T score for the squat jump test with nine, ten and eleven year old students all scoring below the mean for the Washington State Elementary Physical Fitness Test.

In the thirty-yard dash the writer observed many students stopping at the finish line instead of running on through as they were instructed to do. This is thought to be the major reason for the poor performance on this test.

The author feels that the Washington State Elementary Physical Fitness Test is relatively easy to administer by a classroom teacher. It is also very practical because it requires very little space or equipment and can be administered in a short period of time.

III. RECOMMENDATIONS

Following are some recommendations to be considered:

1. The Washington State Elementary Physical Fitness Test should be administered twice a

year by the elementary classroom teachers.

2. The parents of the tested students should be informed of their child's performance and when thought necessary some home improvement activities should be included.
3. A well rounded physical education program should be conducted daily with special emphasis given to areas of low physical fitness as determined by these tests.

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APPENDIX

TABLE I

CLASS SCORE SHEET

Class _____

Date _____

Key
S = Score
P = Points
R = Rating

RATINGS
1 - Superior
2 - Average
3 - Below Average
4 - Poor

NAME	AGE	POWER			STRENGTH AND ENDURANCE									SPEED			PHYSICAL FITNESS	
		No. 1 Stdg. Broad Jump			No. 2 Bench Push-Ups			No. 3 Curl-Ups			No. 4 Squat Jump			No. 5 30-yd. Dash			Total	
		S	P	R	S	P	R	S	P	R	S	P	R	S	P	R	P	R
BOYS																		
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TABLE II

Dear Parents,

One of the important roles of every teacher is to inform the parents of what one is attempting to accomplish through the various educational activities. This report card will give you an idea of how well your child is doing with respect to one important phase of the physical education program; namely, the development of physical fitness.

Recently we have become increasingly concerned about the state of physical fitness of our youth. Parents and teachers alike want to know if their children are fit enough to carry out their everyday activities--if they possess sufficient energy to meet unforeseen emergencies--if they, by an acceptable standard, are above or below the average level of fitness for their age. Of course, this is a difficult task since children of the same age differ in their rate of physical development as well as in terms of the type and intensity of their everyday activities. Both of these factors are extremely important in understanding the physical fitness of children and therefore were considered in the development of this test battery.

The report on the opposite page is a record of your child's performance on the standardized Elementary School Physical Fitness Test. This test is designed to measure strength, endurance, power and speed, which are considered to be basic elements of physical fitness. Hence, if your child records a high level of performance in these elements, he is considered to be physically fit. However, if the level of performance is low, we assume the child is unfit, or handicapped, to meet everyday activities or any unforeseen emergencies.

Sincerely,

_____

Physical Education Teacher

TABLE III

HOW FIT IS YOUR CHILD

Listed under Chart A is the score and rating your child made on each test item. The ratings indicate how well your child has done with respect to the performance of other boys and girls of the same age. A clearer picture may be drawn by comparing these scores with the average performance shown in Chart B. Here you will see if your son or daughter is above or below the average performance for each test item. The difference in the scores from Trial I and Trial II will indicate the change in your child's level of physical fitness.

CHART A - INDIVIDUAL PERFORMANCE

Elements of Physical Fitness	Test Items	Individual Performance			
		Trial I	Rating	Trial II	Rating
Power - Measured in inches	Standing Broad Jump				
Strength - Measured and Endurance in number of repetitions	Bench push-ups				
	Curl-ups				
	Squat jump				
Speed - Measured in seconds	30-yd. dash				

HOW TO INTERPRET RATINGS

1 = Superior - Means approximately 15 per cent of this age would either attain or surpass this score.

2 = Average - Means approximately 35 per cent of this age would attain this score.

3 = Below Average - Means approximately 35 per cent of this age would attain this score.

4 = Poor - Means approximately 15 per cent of this age would either attain or register lower than this score.

CHART B - AVERAGE PERFORMANCE

Test Item	6 yrs.		7 yrs.		8 yrs.		9 yrs.		10 yrs.		11 yrs.		12 yrs.	
	B	G	B	G	B	G	B	G	B	G	B	G	B	G
Standing broad jump (in.)	40	39	43	43	49	45	53	45	55	51	57	54	59	54
Bench push-ups (number)	14	8	13	9	12	10	16	11	16	9	16	8	20	10
Curl-ups (number)	4	5	7	5	10	11	13	12	16	16	19	21	24	15
Squat jump (number)	17	16	19	16	20	18	22	21	21	20	24	22	24	22
30-yd. dash (seconds)	6.5	6.5	6.0	6.0	5.5	6.0	5.5	5.5	5.0	5.5	5.0	5.0	5.0	5.0