A CLASSIFICATION TEST FOR JUNIOR HIGH SCHOOL GIRLS IN PHYSICAL EDUCATION

by

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There is a need in physical education for a performance test which classifies according to ability at the junior high school age and which is efficient in time and equipment. The development of such a test was the objective of this study. A test was desired which could be administered to a class of thirty-five girls in thirty minutes of activity, uncomplicated in form and the equipment needed, and which could be administered by one teacher and yield results easily interpreted and acceptably valid and reliable.

A review of literature supported homogeneous classification as desirable in physical education. The factors of ability in performance were studied. Methods of classifying which have been used were analyzed, and the more applicable performance tests and items were examined to shape a new test.

Two tests were devised using continuous performance items and seeking to measure the factors of ability. These two tests were administered to one class each of seventh, eighth, and ninth grade girls. No statistical discrimination could be made between the two tests, but Test I was selected for further study for its better efficiency and in light of preferences of experienced teachers. Test I showed a validity with thirty-three ninth graders of .6015, with thirty-six eighth graders of .6155, and with thirty-one seventh graders of .5256, using totaled skill ratings in four units as the

criterion. The reliability for the entire group of one hundred was .6743 by the test, re-test method.

Test I consisted of a side-step, a run, a ten-foot wall pass, and another run. The wall pass was increased to fifteen feet and instructions were added to aid the subjects. The revised test showed a reliability of .7484 by the test, re-test method for ninety-one ninth grade girls.

The Classification Test, revised Test I, was administered to a new group of subjects and validated with objective skills grades. The Pearson Product Moment correlation coefficient for ninth grade girls was .6430, and for seventh grade girls .3849.

The Classification Test is acceptably valid and reliable for ninth grade girls. It was administered to forty-seven girls in thirty minutes of activity by one test administrator. It is efficient in time and equipment and is simple in form and interpretation. Further study is necessary to determine its value for eighth grade girls. The ten-foot wall pass may be preferable for seventh grade girls, and further study is needed for that grade level also.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

I. INTRODUCTION

> Classification implies selection of students for specific sectionings or groupings in accordance with specific criteria and is employed for a number of purposes, the most common being facilitation of instruction and learning, assurance of program continuity, and equalization of competition in games and sports. In the first two instances, homogeneous classification is the desired objective so that the members of the group are at approximately the same level in terms of background and ability to progress. (9:421)

Homogeneous grouping is recognized by most educators as a valuable type of classification. The use of grade levels in our schools is itself a basic type of homogeneous grouping, seeking to achieve the first two purposes mentioned above. Great variations remain within the age and grade level, with each individual varying in ability in each subject area and phase of schooling. A large range of abilities within a class may seriously handicap the teacher's effectiveness and the student's progress.

> If pupils are placed in homogeneous groups for participation in physical education it is easier to administer the classes in such a way that each child will take part in activities suited to his needs and abilities. . . . Classification also serves the purpose of equalizing ability within relatively narrow ranges. It is almost impossible and entirely impracticable to equalize ability completely. . . . It is practicable, however, to place children in classes in which the range of ability is limited. . . . The classification of pupils enables each child to participate and compete with others whose abilities

> are approximately equal to his. He will, therefore, achieve success in the activities equal to that of his fellows and will be interested and eager to participate because it provides pleasure and satisfaction. (17:236)

Williams says, "Classification should take into account the fact that a group of individuals about equal in ability will make better progress in learning and will improve the quality of instruction." (20:429)

Homogeneity in what respect, is the question that now arises. In the past, classification has been done primarily on the basis of age, height, and weight. "Age, height and weight do not indicate the amount of muscular development, the amount of muscular endurance, nor the experience and training possessed by any individual." (5:36) Classification tests ". . . should be used in relation to the aims of the program." (14:400) If fitness is the objective, then fitness tests should be used to group students. If the development of strength is the objective, then strength tests should be used. But if the objectives encompass motor development, skills, and abilities, then classification should be made with a suitable test. From this concept has arisen motor ability testing which attempts to measure the present level of performance of basic skills.

Another point to be considered is the efficiency of administration. In the junior high school situation there is one teacher per class and rarely additional staff to assist in testing. The Humiston Motor Ability Test, as an example, uses seven items and is rather complex in the equipment required

and in the nature of the stunts to be performed. The Scott Motor Ability Test uses a minimum of three items. The administration of several items is time consuming, for the teacher should administer all items to insure objectivity from student to student.

Nash has written, "Classification routine should be cut to a minimum. It should occupy the first few days of each semester and, once classified, children should remain in specified groups for the semester unless emergencies arise." (13: 366) Thus, efficiency in administration as well as accuracy in measurement are desired.

The need is apparent for a classification test which will provide homogeneous groupings in physical education according to present ability levels and which will be efficient to administer. The assumption is made here that the objectives of the program are the development of motor abilities and physical performance.

CHAPTER II

PURPOSE

The need is evident for a performance test which classifies according to ability at the junior high school age and which is efficient in time and equipment. It is the intent of the author to devise such a test.

The requirements to be met by the classification test to be developed are the following:

1. It should be possible to administer it to a class of thirty-five students in thirty minutes of activity.
2. It should be a single-item test, with a continuous performance involving several criteria of ability.
3. It should be uncomplicated in its administration and performance so that only brief explanation is required, and motor performance is measured rather than understandings.
4. It should not involve equipment or facilities that would limit its use.
5. The results should be easily interpreted.
6. It should be acceptably valid.
7. It should be acceptably reliable.
8. It should show objectivity.

CHAPTER III

REVIEW OF LITERATURE

In order to pursue the development of a classification test, the purposes of such testing must first be understood. The desirability of homogeneous grouping in physical education should be examined, as well as the elements of the criteria to be used to group students. The methods of classification which have been used in the past, and are applied to today's classifications, are also to be studied.

I. HOMOGENEOUS CLASSIFICATION IN PHYSICAL EDUCATION

Homogeneous classification has long been an integral part of education. Students are classified by age, achievement, and maturity into grade levels in present school structures. The recent trend toward ungraded elementary schools does not oppose homogeneous grouping, but rather uses a more specific criteria of homogeneity, that of achievement as opposed to age as the determinant of progression. Homogeneous grouping is an accepted method of assignment within grade levels in junior and senior high schools, as well as in higher education.

> There is no doubt in the minds of experienced teachers that class instruction is more efficient when the abilities of groups are similar. . . . Equating. . .brings together pupils of near equal

> ability, all of whom are ready for instruction on approximately the same level. Skills may thus be taught effectively and efficiently.
>
> Homogeneous grouping, too, may be far more important in physical education than in scholastic phases of the educational program, as the manner of an individual's participation in many physical activities--what he does, how he reacts--depends to a large extent upon the actions of those participating with him. (4:248)

Lockhart and Mott compared homogeneously grouped classes with heterogeneously grouped control classes in physical education for college freshman women. The Scott Motor Ability Test was used to classify the students. Within the homogeneous groups, the superior class benefited significantly from the separation, though the inferior class showed no significant difference from the inferior students in the control group. There was a definite preference for homogeneity stated by the students. (27:58-62)

Nash has said,

> It is a primary function of education to prescribe activities whereby the individual's present achievement level is raised, as near as possible, to his ultimate capacity level. Hence the classification of individuals and the classification of activities become essential in an educational program. (13:292)

Throughout the diverse range of physical education publications, where classification and class assignment have been mentioned, the great majority of writers were strongly in favor of homogeneous grouping in physical education activities. From his studies, Sharman stated that,

> The grouping of pupils homogeneously for the purpose of instruction in physical education is generally recommended by teachers of physical education, and a review of literature on the subject reveals that the majority of writers advocate the procedure. (18:56)

Previous evidence has spoken of the facilitating of the teacher's task and the improvement of the learning situation for the student. These are prime reasons for classification. Clarke has added two other purposes of ability grouping: "desirable attitudes toward physical education; and social development." (4:248) To elaborate, the child who is of lesser ability can often be stymied in a class with excellence surrounding her. She may seek escapes or withdrawal in her feelings of inferiority. For the highly skilled, motivation is more difficult when her level so far excels that of her classmates. The social problems that accompany these situations are limitless. Grouping into classes of near equal ability can eliminate the great extremes and thus alleviate these situations.

Oberteuffer has pointed to still another concept of education, that of meeting individual needs.

> It is considered better practice to have smaller groups of students with similar needs than larger groups with a variety of needs.
>
> Thus the theory of homogeneous grouping can be applied to physical education advantageously. The teacher can do a better job of teaching if (1) he knows the student as an individual; (2) the student is given some individual attention and instruction; and (3) there is just enough variety in the group to stimulate all of them to improve. (14:399-400)

With a more narrow range of ability the teacher can teach to the level of the entire group much more readily than with the broad range of ungrouped classes.

Homogeneous classification in physical education is a recognized concept, and, too often, an unfulfilled need.

II. CRITERIA OF HOMOGENEITY

Brownell and Hagman have summarized the classification movement in physical education:

> The wave of science swept over physical education in the classification of students and in the prediction of activity achievement for a given classification potentiality. Anthropometric measurements enabled the investigator to compare numerous anatomical structures of the individual youth with established norms. Cardiovascular tests determined physical efficiency by certain ratios of pulse rate and blood pressure and the time required for the individual to return to 'normal' after completing a prescribed number of foot-pounds of work. Other researchers classified students into similar groups, and proposed achievement standards for each group, by mathematical combinations of age, height, and weight. A few years later, investigators constructed classification tests based upon a statistical analysis of motor ability, the relative strength of certain skeletal muscle groups, and the potential ability of an individual to translate this strength into explosive or energy power. Each of these techniques had its day and enthusiastic supporters who defended their beliefs with professional zeal. (3:316-317)

Classification is a tool of education, and the type of homogeneity desired is dependent upon the desired outcomes of the program. The objectives of any junior high school physical education program are broad and must be analyzed to choose the type of classification most desirable.

Davis and Wallis have disclosed many types of criteria and the accompanying complexities:

> Let us remember the different relative ranks of individuals in different traits, their different rates of learning in each trait, and the difference in one individual's rate from that of other individuals. Then let us ask ourselves whether we intend to group our students homogeneously for:
>
> 1. Height, weight and age
> 2. Organic vigor
> 3. Strength
> 4. Particular skills
> 5. Health
> 6. Anatomical age
> 7. Motor educability
> 8. Endurance
> 9. Social conduct and attitude
> 10. Interests
> 11. Needs
> 12. Improvement (7:145)

To this list the recent interest in physical fitness may be added.

Irwin has described a method of classification:

First - three groups, from medical examination
  1. regular program
  2. restricted activity
  3. no physical work

Second - age
Third - skill and ability
Fourth - social maturity (10:298-300)

Davis and Lawther have suggested that, "Strength, height, weight, age, physical capacity, motor ability, achievement in specific activities, and physical ability are some of the proposed bases of classification." (6:580)

Barrow and McGee have offered the following:

> Students may be grouped first by the medical examination, next by grade in school, and then by sex, if necessary. A fourth ingredient can be introduced at this point which will insure that more of the purposes and values of classification will be realized. This ingredient is ability. (1:424)

For facilitation of instruction and homogeneity in ability levels, with skill improvement a major objective, one is led to select some measure of ability in a varied program as the means of classification after the preliminary medical examination, which places students into activity, restricted activity, and no physical activity groups.

It should also be noted that classification may continue within the class group into squads or smaller groups. The teacher can determine whether it is more advantageous to group for the purpose of equality within or between squads, to implement instruction or equalize competition.

Speaking in terms of the varied program and the variety of individual differences, Havel and Seymour have pointed to the efficient solution:

> If. . .programs consist of a large number of activities, each of which is of relatively short duration, it is administratively preferable to utilize a test of general motor ability as the basis for classification and retain the same groupings for the various activities. (9:423)

The limitations of any classification test should be noted:

> The instructor, however, must be aware of the limitations of all classification systems. These techniques are merely for convenience, and while in theory they divide groups into well-defined categories, in practice there always will be the twilight zone where there will be borderline cases and overlapping of characteristics and needs. At the onset the instructor must recognize the need to make exceptions for those who do not fit into the categories. (1:418)

III. FACTORS OF ABILITY

Pearson has listed some generally accepted factors of ability: "Seven major factors enter into the testing of physical performance: strength, agility, endurance, speed, coordination, flexibility, and balance." (15:88) Three other factors have been included by Barrow and McGee: power, kinesthetic sense, and hand-eye-foot-eye coordination. (1:116, 120 & 121)

These factors are the components to be measured in most motor ability, physical performance, achievement and similar tests of general ability. The majority of performance tests for classification purposes fall under the motor ability title. Scott and French have defined the term:

> The term motor ability is sometimes used to mean achievement in basic motor skills, or it may be interpreted as a more general item combining the concepts of motor educability and achievement. (16:192)

They defined motor educability as "The inherent aptitude (motor and mental) for learning new skills quickly and effectively." (16:191)

Barrow and McGee have defined motor ability as "The present acquired and innate ability to perform motor skills of a general or fundamental nature, exclusive of highly specialized sports or gymnastic techniques." (1:548) and motor educability as, "The ease and thoroughness with which one learns new motor skills." (1:548)

IV. CLASSIFICATION IN THE PAST

Age, Height, Weight, Grade Level

Classifications have been made with students in physical education and children in recreation on a variety of bases. One of the simplest is Andersen's chart, which groups the third and fourth grades in a Junior Class, fifth and sixth grades in an Intermediate Class, and seventh and eighth grades in a Senior Class. (17:238)

The YMCA used a system of age and weight. (17:237-238) The Atlantic City Method uses age and weight within each grade to classify fifth graders through eighth graders. (17:237) The Detroit Method formula, 8 x age weight, provides a set of eight classes for elementary school children. (17:240) The California State Department of Education used the Reilly Method for boys and girls with an exponent table using height, age and weight to place students in classes A through H. (17: 238-239)

McCloy derived formulas for classification purposes in 1934. McCloy's Classification Index for elementary school is:

Classification Index III 10(age in years)
weight in pounds

and for high school:

Classification Index I 20(age in years)
6(height in inches) weight in pounds.

From these computations students are placed in classes A - H for elementary and A - G or A - I for high school. (11:128)

Neilson and Cozens derived another formula similar to McCloy's, and correlating .983 with McCloy's method:

Classification Index = (20 x age in years) + (5.55 x height in inches) + weight.

They have provided a table for elementary and junior high boys and girls. (11:129)

Performance Tests

McCloy recognized the importance of strength in classification and later derived a new formula, McCloy's Chinning Formula:

Chinning Strength (Boys) = 1.77 weight (lbs.) + 3.42(No. chins) - 46

Chinning Strength (Girls) = .67 weight (lbs.) + 1.2(No. chins) + 52. (5:360)

Cureton has said of this formula: "McCloy's Chinning Formula is a much better classification device for predicting athletic performance than any of the age-height-weight formulae." (5: 360)

On the subject of strength measures, Cureton has spoken of another index: "The Rogers' Strength Index has been widely used as a gross athletic classification device and for this purpose is very valuable." (5:360) The Rogers' Strength Index is composed of four events: sprint run, running high jump, running broad jump, and shot put. (5:360)

It should be noted here that strength measures have proven more applicable to the classification of boys than girls. In the usual physical education activities for girls,

strength is of less importance, above a minimal level, for performance of skills than in many boys' sports.

Another type of measurement which may be used for classification is motor capacity, defined by McCloy as, "inborn, hereditary potentialities for general motor performance." (11:146) McCloy's Motor Capacity battery consists of a classification index, the Sargent jump, and Burpee test, measuring size and maturity, power, and agility and large muscle coordination respectively, weighted in a formula. (11:146) Scales are available for junior high school girls.

Motor ability has been an evasive quality, identified and measured in a variety of ways. Almost every creator of a motor ability test has a slightly different concept of motor ability and the way to measure it. The tests devised have served as tools for classification, as well as for the evaluation of students and programs and other purposes, for varied age levels. The usual factors involved are: speed, agility, strength, power, coordination and endurance. The emphases, omissions, and additions will be evident from the following chronological review of motor ability and related testing.

In 1923 Garfiel devised a motor ability test using sixteen items. It was administered to college sophomore women. (23)

The Brace Test was published in 1927, and consists of twenty stunts. The students tested passed or failed each stunt. (2) This has been termed the first motor educability test.

Wayman constructed a motor ability test in 1930 in a study with college freshman women. This test consists of eight items, including a high jump, throw for distance, dash and gymnastic stunts. (19:313-314)

In 1932 Alden, Horton and Caldwell selected seven items to form a battery of fundamental bodily skills to measure motor ability in college women for the purpose of classifying entering students into homogeneous groups. (21:85-120) In the same year, McCloy published his Athletic Ability Test, used to derive the Athletic Quotient. The test consists of a fifty-yard dash, standing broad jump, shot put, and running high jump. The scores convert to points, and the points are totaled. His age, weight, height Classification Index is used with the performance points to arrive at an Athletic Quotient. (1:157) This same test was later published as a part of McCloy's General Motor Ability Score (GMAS) for Boys, which includes a chinning strength factor derived from a weight and chinning formula. McCloy's General Motor Ability Score (GMAS) for Girls uses pull-ups, a sprint, a broad jump and a throw for distance. (11:145)

In 1936 Cozens determined by factor analysis that speed, coordination, power and endurance are the primary elements that make up general athletic ability. He constructed a seven item test, Cozen's Test of General Athletic Ability, consisting of a baseball throw, football punt, bar snap, standing broad jump, dip, dodging run, and quarter-mile run. (11: 137) Norms were established for college men.

Oberlin College used a general motor ability test in this period, consisting of ten items with a standard set for each which is passed or failed. It includes running, jumping, vaulting, climbing, pulling and lifting, pushing, throwing, swimming, tumbling and balancing. (11:144)

The Humiston Motor Ability Test for college women is composed of seven items in a continuous performance: dodging run, sideward roll on a mat, climb over a box, turn in a circle and continue through barriers, ladder climb, basketball throw over a rope, and short straight-away run. (24:181-185) This test correlated highly with the criterion, but is difficult to administer in terms of equipment. Kammeyer (25:310-315) and Broer (22:139-145) later examined the validity and reliability of revised forms of the Humiston test, adapted to a smaller space. Both researchers found that the best of two trials gave a reliable score. Broer dealt with junior high school girls and Kammeyer with high school girls. Kammeyer also arrived at a validity of .69 to .80 for this test with high school girls, computed with criteria of several performance tests.

In 1937 McCloy constructed the Iowa Revision of the Brace Test of motor educability, using ten of the Brace items and eleven new stunts. McCloy was seeking a better measure of educability and concluded with six groups of ten stunts each for the upper three elementary grades, junior high school and senior high school, for both sexes. (11:150) In the same year Kistler constructed three test batteries, using

a variety of runs, jumps, the Burpee, and classification indexes. (26:11-19)

At Wellesley College three studies took place around 1938 to 1939. In these studies batteries for motor ability testing were set up and then administered to high school girls. Some items were: a broad jump, baby hurdles, a scramble, and a velocity throw. (29:49-56)

Newton's Motor Ability Test for high school girls was constructed in 1939, consisting of a broad jump, hurdles and a "scramble". The "scramble" starts from a supine position and involves a ten foot run to a tap bell and return to the starting position, four times. (11:131)

In 1939 the Scott Motor Ability Test for high school and college women was first published. Statistical analysis of items led to the selection of five items to be combined in a choice of two batteries of three or four items. An obstacle race, basketball throw for distance and standing broad jump make up one battery. A wall pass and four-second dash may substitute for the obstacle race in the second battery. (11:132) T-scales are available. (11:134-135) Broer has applied the Scott test to junior high school girls to determine its reliability for younger subjects. It was found that the best of three trials gives a reliable score for the basketball throw for distance and the standing broad jump, and that the average T-score of the four-test battery gives a reliable score. Broer also compared the Scott Motor Ability

with a revised form of the Humiston Motor Ability Test and found a correlation of .60, indicating that the two tests measured somewhat different elements of ability. (22:139-145)

In 1941 the Larson Motor Ability Test was constructed for secondary school boys and college men. From twenty-five items two batteries, an indoor and an outdoor test, were derived. Larson sought to test the basic elements underlying sports skills and proposed the use of test results for classification. Running, jumping, throwing and strength tests make up the batteries. (11:140)

Peacock set up the Peacock Achievement Scales in Physical Education Activities for Boys and Girls for ages seven through fifteen. The items are: a softball throw for distance, soccer punt for distance, forty-yard run, standing broad jump, side-stepping, and grip strength. Norms are available. (1:173-181)

In 1953 Barrow constructed the Barrow Motor Ability Test for college men and junior and senior high school boys for classification and guidance purposes. Two batteries are available, the more valid consisting of six items (11:135-136). The more practical three-item battery is made up of a standing broad jump, a zigzag run, and a six pound medicine ball put. T-scales are included in the reference. (11:143-148)

The Latchaw Motor Achievement Tests were published in 1954, for fourth, fifth and sixth grade boys and girls.

Included in the battery are: the basketball wall pass, volleyball wall volley, vertical jump, standing broad jump, shuttle run, soccer wall volley, and softball repeated throws. Norms for each grade and sex are available. (1:149:157)

V. SUMMARY

Most physical educators have advocated homogeneous classification of students according to ability for the facilitation of teaching and the enhancement of learning. In order for such grouping to take place, it is necessary for some means of classifying students to be developed through objective measurement. From the beginning simplicity of age or grade classification, the science of physical education has evolved to more valid tests of motor ability and motor achievement for predicting the performance of an individual and a group. As long as the objectives of physical education include the improvement of physical performance, physical educators will strive to measure and predict that performance with more accuracy and efficiency.

CHAPTER IV

PROCEDURES AND ANALYSIS

A classification test for junior high school girls was to be designed to measure the factors involved in the performance of the skills included in the physical education program. The efficiency of administration was a prime factor and helped to shape the test design. Two tests were to be constructed and administered, with the better of the two to be further developed and administered to a larger group.

I. FACTORS OF ABILITY

The survey of literature in the previous chapter sought out the factors of ability in physical performance. Eleven such factors were selected which encompass most of the elements of performance generally described by various authors. These eleven factors are agility, speed, body coordination, strength, endurance, flexibility, hand-eye coordination, foot-eye coordination, power, balance, and kinesthetic sense. The attempt was then made to include as many of these factors as possible in discriminating items in a short test.

II. TEST ITEM SELECTION

A survey was made of items in motor ability, physical achievement, physical fitness, and other physical performance testing. From these items, compiled in a card file, selection was made according to the factors measured and the feasibility of their use in a continuous, short performance. The items selected will follow, with a brief description of the performance of items in tests studied and the factors of ability which appear to be involved.

Side-step

Two lines eight feet apart are needed. The subject side-steps from one, touches the other, side-steps back, touches the first line, and continues for the time limit. The feet may not cross over and the shoulders must remain perpendicular to the lines. Several methods of scoring have been used with this item. The number of one-way trips made from line to line in a certain period of time is scored in one description. Other methods utilize a middle line four feet from each of the other lines; the trips are counted across the middle line or for the crossing of each line within a certain time period.

Agility is measured in this item in moving the body quickly over a short distance. Body coordination is a large factor in the rhythmical step for better speed. Speed is a factor in moving back and forth. Flexibility enters into the

stretch that is advantageous for better performance. Kinesthetic sense is an element in judging the step and rhythm for the test. Foot-eye coordination is needed in judging properly the reach and step. Balance appears to enter into the quick reversals of direction and quick recovery.

Shuttle Run

The shuttle run chosen was of the type used in the AAHPER Physical Fitness Test. That item uses two lines thirty feet apart and two small blocks placed on the second line. The subject is timed as she runs from the first line, picks up a block at the second line, returns to the first line, places the block behind the line, returns to the second line, picks up the second block, and runs back across the first line carrying the block.

Agility is a primary factor tested by this item in the quick movements back and forth and the reversals of direction. Speed is measured in the short runs across the floor. Flexibility is involved in the bending for the blocks and placing the one down. Body coordination is a factor affecting the speed of agile movement. Power is a factor in the several quick starts resulting from reversing the direction of movement.

Figure-eight Run

The figure-eight run is one type of obstacle run. Such obstacle races are common to many performance tests. The changing of direction is the chief task involved as the subject runs around obstacles in a looped path. This is a timed item.

This run measures speed in moving through the course. Agility plays a part in the changing of direction. Kinesthetic sense enters into the judgment of the pace in the loops and speed control throughout the run. Balance affects the speed with which one can turn the loops. Strength and coordination affect the speed of the run.

Wall Pass

The restraining line on this item varies from five to nine feet in most of its uses. The subject throws a basketball from behind this line against a wall, catches the rebound, and repeats as rapidly as possible. A target is often used. The number of hits within a certain time limit is the usual method of scoring.

In the wall pass, eye-hand coordination is involved in catching the ball as it returns from the wall. Body coordination enters into the throw and catch. Kinesthetic sense is a factor in judging a good return with control and speed. Strength appears to be a factor and an attempt was made to confirm this judgment, which will be discussed later. Endurance appears to enter the picture on observation, as the pace slows for junior high school girls throwing from ten feet after seven or eight throws, and from fifteen feet after five or six throws. Agility and flexibility may be considered factors involved in the coordination required to speedily retrieve a returning ball and throw.

Short Run

Dashes and runs are used in practically all performance testing. The short run involves a quick start and a fast run, with no restraint to a full-speed finish.

Speed is the chief element measured in this item. Power affects the speed of the take-off. Strength and coordination are contributing factors affecting the resulting speed.

III. RELATED INVESTIGATIONS

Ideally, each factor of ability should be tested for its role in each of the test items. This was attempted with the strength factor and the wall pass item. The strength element was chosen because it is more measurable than most of the other elements, and because the author sought to discover its role in the throwing test item.

Arm and shoulder strength were chosen as the strength components involved in throwing. The bent arm hang was used to measure arm strength and the push-pull dynamometer was used to measure arm and shoulder strength.

The bent arm hang was administered on a door-way adjustable bar. It was placed so that the subjects were able to reach it comfortably above their heads. The subjects were allowed a jump to get to the hanging position, palms toward the face, with the arms fully flexed and the feet off the floor. The time was recorded to the nearest tenth of a second from the assumption of the fully flexed position until the arms extended beyond a ninety degree angle at the elbows.

The push-pull dynamometer strength test was administered as described by Scott and French:

> Hold the apparatus in front of the chest, one hand on each handle; elbows bent and arms in a horizontal plane. Pull as hard as possible. . . .In the same position push in on apparatus as hard as possible; the heel of the hand may be used. Do not brace the apparatus against the chest in either trial. (16:168-169)

The best of three trials was the score taken on the dynamometer with the push-pull attachment, with the results adjusted according to the correction table worked out for the instrument.

The wall pass was administered from a restraining line ten feet from the wall against an unobstructed wall space ten feet square. The subjects were told to throw the ball against the wall twenty times as quickly as possible. They were not allowed to cross the restraining line in throwing, and were instructed to retrieve a dropped ball, return to the restraining line, and continue. Three timers took the time readings on stop watches to the nearest tenth of a second from the starting signal until the ball had returned to the subjects' hands after the tenth, fifteenth, and twentieth hits against the wall respectively. One timer counted the hits against the wall aloud and each timer timed her respective number of hits.

The subjects selected for the test were girls in a normal seventh grade class in a junior high school. The class consisted of twenty-three girls with a normal ability level and range, according to the judgment of their teacher.

The bent arm hang, push-pull dynamometer strength test and the wall pass test were administered in one class period by

a system of rotation. The only exceptions to strict observance of the testing procedures were in a few cases in the wall pass when violations of the restraining line or ball retrieving difficulty indicated that another trial should be given the individuals involved. From the test results, eight correlations were made by the Pearson Product Moment method (1:97-101).

TABLE I

CORRELATIONS BETWEEN THE BENT ARM HANG, PUSH-PULL DYNAMOMETER, AND WALL PASS TESTS

TESTS	WALL PASSES 10	15	20
Bent Arm Hang	-.0358	.0795	.1216
Dynamometer	.1896	.1596	.1540
10 Wall Passes	---	.9502	.9321

Neither strength measure was significantly correlated to any of the wall pass measures. (8:131-132) No significant correlation was found between arm and shoulder strength and the wall pass. It is apparent that greater strength will allow a performer to throw a ball harder and faster in a test. Many other factors enter into this complex maneuver, such as eye-hand coordination, agility, skill in the execution of the throw, and kinesthetic understanding of the best technique for speed. Strength alone could not be detected as an isolated factor in this test.

IV. TESTS DEVISED

The items selected, as previously described, were included in two separate tests. Both tests were made up of a continuous performance of several items testing to some degree most of the elements of the factors of ability.

Test I

Test I was made up of a side-step, a short run, a wall pass, and another short run. Gymnasium space was needed with an unobstructed wall space ten feet square and floor space twenty feet wide extending sixty feet from the wall. This allowed only ten feet for the subject to stop after a forty foot run to the starting line. Additional space behind the starting line would enhance the testing situation, enabling the subject to finish with maximum speed and no restrictions. The floor markings are shown in Figure 1, page 28. These lines were made with floor marking tape. The equipment needed for the test consisted of one basketball, placed on the six-inch square marked on the restraining line, and a stop watch for the test administrator.

The test began with a side-step. The side-step item in the Peacock Achievement Scales (1:176) is performed with three parallel lines, four feet apart, and is scored by counting the number of crossings of the middle line in fifteen seconds. Because the test being constructed was a timed, continuous performance, the middle line was omitted and the number of round

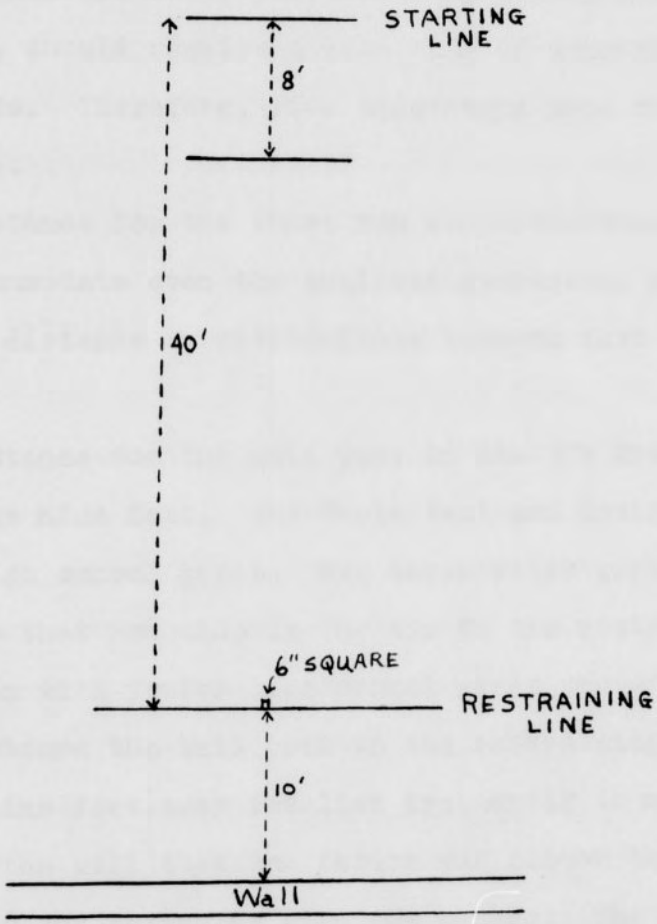

FIGURE 1

FLOOR PLAN FOR TEST I

trips side-stepped across and back was prescribed. The mean time for the execution of the entire test was planned to be about thirty seconds; the mean time to be allotted for the side-step was approximately fifteen seconds. The mean score on the Peacock Scale for twelve through fifteen year old girls is ten crossings of the middle line in fifteen seconds (1:180). Five side-steps across and back, corresponding to ten crossings of a middle line, should require a mean time of approximately fifteen seconds. Therefore, five side-steps were chosen for the first item.

The distance for the short run was determined by the desire to accommodate even the smallest gymnasium, still providing enough distance to discriminate between fast and slow performers.

The distance for the wall pass in Scott's Motor Ability Test (1:167) is nine feet. The Scott test was designed for college and high school girls. For these older girls, a pass is practicable that rebounds in the air to the restraining line. Experimentation with junior high school girls showed that attempts to rebound the ball back to the restraining line in the air from nine feet away resulted frequently in a throw so arced against the wall that the return was slower than with a ball thrown low and returning with one bounce. The rebound in the air was also more difficult to catch and control. Trial runs showed that a ten-foot restraining line encouraged a bounced return which was easier to control and more efficient in time.

A normal seventh grade class of twenty-three girls threw ten, fifteen and twenty wall passes in the testing for arm and shoulder strength and the wall pass. The correlation of ten passes with fifteen passes was .9502, and for ten passes with twenty passes, .9321, as shown in Table I, page 26. These high correlations justified the use of only ten passes to conserve time in the administration of the item. The mean score for high school girls on the Scott Motor Ability Wall Pass item, at nine feet, is ten passes in fifteen seconds (1: 169). Therefore, the combining of a fifteen-second wall pass mean score for ten passes with a fifteen-second mean score side-step item and two short runs should provide a mean test score of only slightly more than thirty seconds.

The test concluded with a short run back to the starting line. The subject was required to catch the tenth wall pass as it returned and drop the ball before running back to the starting line. This prevented the rebounding ball from interfering with the run and avoided time loss from retrieving stray balls.

One assistant was needed in the test, and a student could adequately serve in that role. The assistant stands to the side of the restraining line for each subject. As the subject is performing the wall pass, the assistant counts aloud the number of throws as they strike the wall so that the subject is not required to count as she performs.

The test administrator stands at the starting line, gives the starting signal, and counts aloud the side-steps.

Each time the subject returns to the starting line one trip is counted. The side-step must be executed without crossing the feet. If this is not performed correctly, the subject must begin the test again. After the fifth side-step is completed, the subject runs to the restraining line, picks up the basketball, throws ten wall passes, catches the last rebound and drops the ball, and runs back across the starting line. The time required from the starting signal until the final crossing of the starting line is the score, recorded to the nearest tenth of a second.

Failure to touch the lines on the side-step and crossing the restraining line on the wall pass are easy errors to make in performing this test. One or two infractions of the test directions in these two phases of the test were permitted, but repeated infractions warranted the readministration of the test to the subject.

Test II

Test II was made up of an adapted shuttle run, a figure-eight run around chairs, a wall pass, and a short run. Gymnasium area was needed, with an unobstructed wall area ten feet square and floor space thirty feet in width, extending sixty feet from the wall. This allowed only ten feet for the subject to stop, as did Test I. Additional space behind the starting line was desirable. The floor markings are shown in Figure 2, page 32. Arrows should be taped on the floor as indicated in

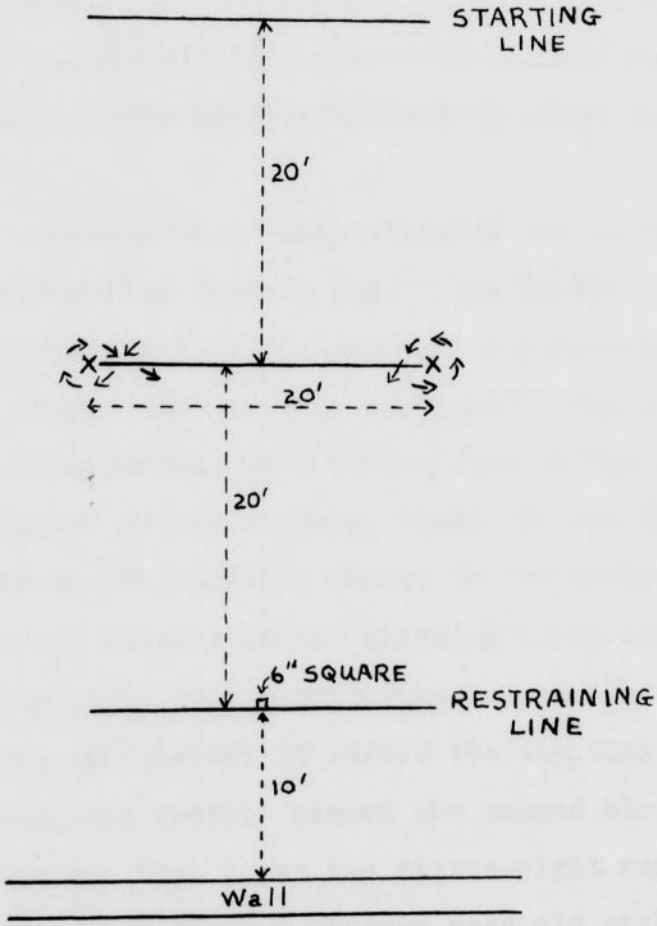

FIGURE 2

FLOOR PLAN FOR TEST II

the diagram for easier understanding of the path to be taken. All of the lines were made with floor marking tape.

The equipment needed for the test consisted of one basketball, placed on the six-inch square on the restraining line; two blocks of wood, two by two by four inches, placed on the line twenty feet from the starting line; two chairs, placed on each cross mark so that the backs of the chairs are above the cross marks and the seats of the chairs face inward toward the center of the course; and a stop watch for the test administrator.

The test began with an adaptation of the shuttle run from the AAHPER Physical Fitness Test. The AAHPER test uses a distance of thirty feet. This adaptation used twenty feet to conserve in administration time and space. The shuttle run required two wooden blocks which were placed on the second line as the subject stood at the starting line. In the AAHPER test, the subject runs on the starting signal to the second line, picks up one block, returns to the starting line, places the block behind that line, runs back to the second line, picks up the second block, and carries it across the starting line. In this modification, the subject placed the second block behind the starting line and then began the figure-eight run. The median score for twelve through fifteen year old girls ranges from 12.0 to 12.3 seconds in the AAHPER test (1:195). Thus, the shorter distance should give a mean score for this item of approximately ten seconds or less.

The figure-eight run is continued from the shuttle run. The subject goes first to the chair on her right as she runs toward the wall. She runs to the left of the chair and around it, and then toward the second chair, running to the right of it as she approaches it, and around it and on to the basketball at the restraining line. This run may be thought of as looping around the chairs. Arrows should be taped on the floor to simplify the directions for the subjects. An estimation was made that five seconds would be required for this run.

The wall pass item follows, with ten passes made and caught from behind the ten-foot restraining line as was described and explained in Test I. The tenth pass is caught and dropped, and the subject finishes with a short run back to the starting line, as in Test I. Thus, one assistant at the wall pass is needed, and another to replace the blocks on the twenty-foot line after each subject completes the test. The blocks should not be replaced while the wall pass is being performed, for the subject may trip on them on her short run back to the starting line. The test administrator stands at the starting line to time the complete course to the nearest tenth of a second.

V. PRELIMINARY TESTING

Test I and Test II formed the bases for the development of a junior high school classification test for girls. Only through the application of the tests could their values and weaknesses be ascertained. The following procedures were carried out.

Selection of Subjects

Plans were made to administer Test I and Test II to a group of normal junior high school girls. Kiser Junior High School, Greensboro, North Carolina, cooperated in this study and provided one class each of seventh, eighth and ninth grade girls. These were regularly scheduled classes in physical education and were judged normal in ability and range of ability by the two experienced physical education teachers in the school.

Criteria of Validation

The criteria chosen for the validation of both tests were ability ratings by the physical education teachers. The rating of the students was discussed with the two teachers, both of whom were well experienced in physical education in the school involved. The teachers felt they could not accurately rate the students on a five point scale in each unit taught, for three units would be rated on recall. They felt they could rate the students overall on ability on a five point scale, or separately on each of four units on a three point scale. The three point scale for four units would provide a range from four through twelve points in a totaled rating, and should be a more objective measure than a single five point general ability rating.

The four units used in this rating for the seventh grade were volleyball, speedball, basketball and rope jumping. For the eighth and ninth grades, the units were volleyball,

speedball, basketball and tumbling. Rating scales were designed for each grade and each unit taught at each grade level. Copies of these scales and their accompanying instructions are included in the Appendix. These scales were discussed with the teachers and approved by them as appropriate and applicable to their situations. From these scales, the ratings were made by the teachers for each unit and each student. The teachers were given sufficient time for rating so that they could observe their classes enough to recall and accurately rate the students. Student teachers were working with two of the classes at the time, allowing the teachers more observation time for the ratings. The student teachers also cooperated with the teachers in rating the units they had taught. The student teachers had taught one unit in the eighth and ninth grades.

Administration of Test I and Test II

Two stations were set up in the junior high school gymnasium, one for each of the tests. The floor markings were made in appropriate spaces. The students were to perform both tests in their class periods. As they completed one test they went to the back of the line for the other test. Sufficient time elapsed between performances for the students to recover fully from their first exertion. Students were used to assist in counting the wall passes and retrieving balls, replacing the blocks in Test II, and in recording the scores.

Brief instructions were given to the classes at the beginning of each period for the administration of the tests. They were shown, through a walk-through demonstration and verbal directions, the procedures for the tests and the rules to be followed. No coaching or instructing was given on technique.

The tests were completed for all students present in class within the class periods in each case. Shower time was infringed upon for the last few girls. The class time for the seventh grade class of thirty-one students was forty minutes, for the eighth grade class of thirty-six, fifty minutes, and for the ninth grade class of thirty-three, fifty minutes, including the time required to dress and assemble at the beginning of class and shower and dress after class.

One week later the two tests were readministered to the same classes in the same manner. Instructions were briefer, and the performances ran more smoothly with fewer readministrations for errors.

The Selection of One Test

The results of the two administrations of Test I and Test II were analyzed to arrive at a choice of the better test. Pearson Product Moment Correlation coefficients were computed for the entire test group, using their first performance of the test and the skill ratings in the four units to test validity. Reliability was determined by correlating the first and second administrations of each test.

TABLE II

VALIDITY AND RELIABILITY COEFFICIENTS
FOR TEST I AND TEST II

	NUMBER	TEST I	TEST II
Validity	100	.5749	.5558
Reliability	82	.6743	.6441

It should be noted that the validity was determined for the entire group rather than for each grade level. It was later realized that the mean scores varied among grade levels. Each grade level was rated on a three point scale designed for that grade level. The ratings were made within a grade level frame of reference, while the correlation was made using the three grade range. This detrimentally affected the correlation coefficients for the eighth and ninth grades. Later analysis by grade level, correlating each grade level separately, gave the following results for Test I:

TABLE III

VALIDITY COEFFICIENTS FOR TEST I
BY GRADES

GRADE	NUMBER	VALIDITY r
Ninth	33	.6015
Eighth	36	.6155
Seventh	31	.5256

The validity and reliability of the two tests showed no significant difference. Consequently, the two tests were correlated by the Pearson Product Moment correlation method to determine if they both measured essentially the same factors. The resulting coefficient was .7324. Though correlated, the tests appeared to measure somewhat different factors. Thus, a choice had to be made on other than statistical bases, since neither test was significantly superior, nor were they identical in their measures.

In each of the six administrations of the two tests, Test I was more efficient in time consumption. The mean time of the performance of Test I was 37.8 seconds, whereas for Test II the mean time was 39.4 seconds. More important than the time for the performance was the time involved in readministering the tests to subjects who failed to perform them correctly. In Test I, the error would usually come in the sidestep at the beginning of the test and little time was lost in halting the subject and re-running the item. In Test II, however, the primary errors were in the directions of the run around the chairs, despite the fact that arrows marked the path on the floor. This occurred after the test was well under way and consumed more time in readministering the item. There were also fewer errors made in the performance of Test I than in Test II.

The teachers were asked to state a preference, or to comment in general on the tests. The teacher who had more

experience preferred Test I because it was more efficient and easier to administer and explain to the students. She had also observed a student preference for Test I. The other teacher also preferred Test I for its efficiency and ease of administration, while it appeared to measure as well as Test II.

The students appeared more interested in the side-step item of Test I, and appeared to concert their efforts more for Test I than for Test II. Some students were asked if they had a preference, and most of them chose Test I. Test I used less equipment in its set-up. It also required a simpler floor plan and fewer markings.

The better efficiency of Test I was judged sufficient to warrant its selection. Though much of the reasoning in the decision was subjective, experienced opinions were deemed of good value in such a selection. Thus, Test I was selected as the test to be further examined. After its selection, further work was done to improve the test.

Revision of Test I

The validity of Test I was acceptable in light of the criterion used. Skill ratings indicate success in specific sports. Such success is dependent on motivation, personality and social adjustments, attitudes, and so many other nebulous factors that ability does not correlate perfectly with success in skills by any means. Accepting this handicap in the

correlation, the validity for eighth and ninth grade girls, .6155 and .6015 respectively, was deemed acceptable. The reliability coefficient for Test I of .6743 was more disturbing. A revision, therefore, was sought as a means of improving the reliability.

The side-step item offered little variation in a subjective analysis of Test I. The wall pass was performed by some students with a rebound high on the wall so that it returned to them in the throw. Some subjects changed techniques several times in the test.

Some experimentation was carried out with a restraining line of fifteen feet. It was decided that such a distance, plus some added directions in the instructions to subjects, could make the performance of this phase of the test more uniform, while still discriminating among abilities. This was estimated to increase the administration time but three or four seconds. This time could be afforded for greater reliability.

The other revision was in the addition of a second ball to the side of the restraining line to be used if the first ball strays. Another six inch square was marked on and behind the restraining line, six feet to the right of the original square to designate the location of the alternate ball.

Reliability Testing of Revised Test I

Ninety-one ninth grade girls in three normal classes in a junior high school were selected for the reliability testing. One of the classes had previously taken part in the test at ten

feet, but the remainder of the group was unfamiliar with the test. The floor plan was extended to accommodate the revised test, with the additional square marked and ball added.

Two of the classes met together and were handled as one test group at two stations. In both testing situations, the test was explained, a walk-through demonstration was given, and the directions were given for the wall pass. The students were told to throw the ball so that it struck the wall about head-high so that it would return directly to them on one bounce. They were told that this was the most effective method of performing that phase of the test.

The test was readministered the following day to the same girls. The same instructions were given and same procedures were followed.

The results of the two test administrations were correlated by the Pearson Product Moment method. The reliability coefficient was .7484.

VI. FINAL TEST FORM

All of the preceeding work was in preparation for a classification test for junior high school girls. The test that resulted as the outcome of design and revision is described below as the Junior High School Classification Test for Girls.

Junior High School Classification Test for Girls

The Junior High School Classification Test for Girls is made up of a side-step, a short run, a wall pass, and another short run. Gymnasium space is needed, with an unobstructed wall space ten feet square and floor space twenty feet wide extending sixty-five feet from the wall. This provides only ten feet of space for the subject to stop after her final crossing of the starting line. Additional space behind the starting line would be desirable. The floor markings are shown in Figure 3, page 44. The squares marked on the restraining line are six-inch squares. The lines may be made with floor-marking tape.

The equipment needed consists of two basketballs, one placed on each of the squares on the restraining line, and a stop watch for the test administrator.

The test begins with a side-step. The side-step item is performed without crossing the feet and with the shoulders perpendicular to the lines throughout. The subject side-steps from a starting position with one foot on the starting line across to touch the other line eight feet away with the opposite foot, and then back to touch the starting line again, until she has made five trips across and back to the starting line. The test administrator gives the starting signal and counts each return to the starting line, calling out "Go!" instead of "five" on the fifth return.

After the side-step is completed and "Go" is called to the subject, she continues by running quickly to the basketball

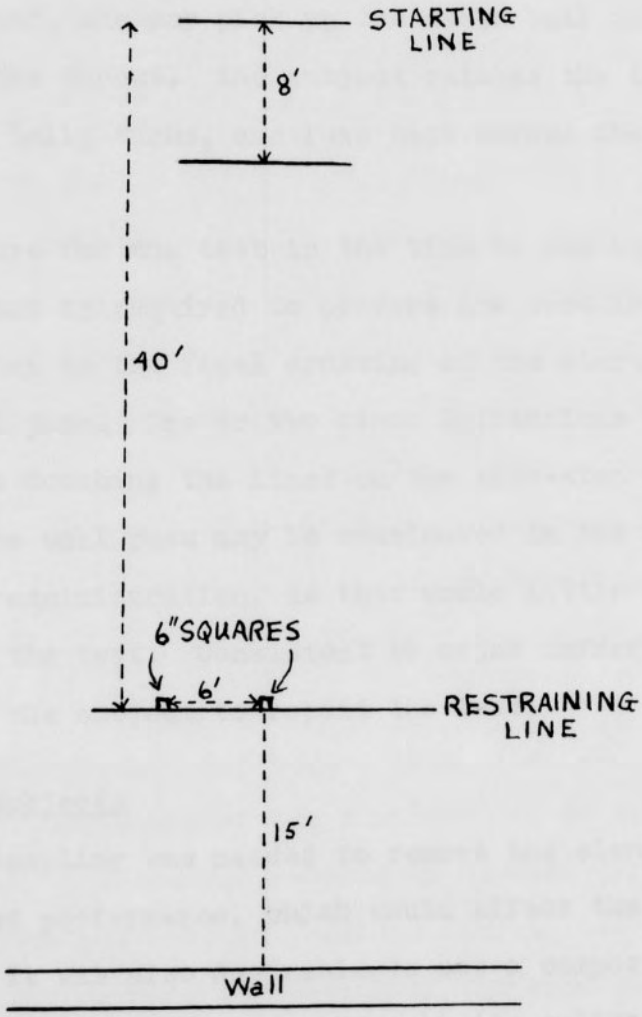

FIGURE 3

FLOOR PLAN FOR THE
JUNIOR HIGH SCHOOL CLASSIFICATION TEST
FOR GIRLS

at the fifteen foot restraining line. She picks up the ball in the center of the area and throws it against the wall, retrieves the rebound, and continues until she has thrown and caught ten passes. An assistant is used to count aloud the number of hits against the wall and to retrieve the dropped ball or balls and return them to the squares. If the subject misses a rebound, she may pick up the other ball to her side and continue the throws. The subject catches the tenth rebound and drops the ball, turns, and runs back across the starting line.

The score for the test is the time to the nearest tenth of a second that is required to perform the test from the start of the side-step to the final crossing of the starting line after the wall pass. One or two minor infractions of the test regulations in touching the lines on the side-step or crossing the line on the wall pass may be overlooked in the interest of efficiency of administration, as this would little affect the total time of the test. Consistent or major infractions, however, require the subject to repeat the test.

Selection of Subjects

A new sampling was needed to remove the element of learning in the test performance, which could affect the validity of the testing. It was also desirable to use a composite of skill grades obtained objectively for the validity criterion. For these reasons, Jackson Junior High School, Greensboro, North Carolina, was consulted and agreed to provide two suitable

test groups, a normal class of thirty-six seventh grade girls and a normal class of forty-seven ninth grade girls, for the final testing group. These classes were judged normal in ability and range of ability by their teacher who was in her second year of experience at the school.

Criteria for Validation

Objective skill grades were the desired criteria for the test validation. The seventh grade students had been graded objectively with skills tests in volleyball and basketball, and objectively in tumbling through achievement records for stunts. In volleyball a serving test and a wall volley test were used to arrive at a skills grade. In basketball a shooting test and a dribble and shoot test were used. The fourth unit in their course was speedball. The teacher had no skills test scores in this unit, but had assigned a skill grade subjectively from observation at the time the unit was completed. These four grades were totaled for a composite skill grade for the seventh graders.

The ninth graders had been graded with skill tests in volleyball and basketball by the same tests. In tumbling they were graded with achievement records in stunts. Their fourth unit in speedball was omitted from the scores used for the criteria on the teacher's evaluation of the grading as too subjective for these purposes. The unit was brief and little weight was placed on it for her grading purposes. The three grades to be used were totaled for a composite skill grade for the ninth graders.

The grades used as the criteria for validation were as objective as were available in the school system. These two classes were selected because their grades were more objectively obtained than the other classes in the school. Other classes were eliminated from the test group because of less objective grading by student teachers.

Test Administration

The Junior High School Classification Test for Girls was administered to thirty-six seventh grade girls and forty-seven ninth grade girls in each of their class periods. It is noteworthy that forty-seven students performed the test in a fifty-minute class period. That fifty minutes including dressing for class, instructions for the test, and release of all students seven minutes before the end of class, as is customary in that school, to shower and dress. Forty-seven subjects were given instructions on a test entirely new to them and performed the test in thirty-eight minutes with one test administrator.

The floor was marked as prescribed for the test with masking tape. The students were gathered at the beginning of the period and were introduced to the administrator by the teacher. The administrator explained briefly that she had devised a test to measure ability in physical education for classification purposes and that she wanted to use it with them to test its value. The students were told that the test score had no effect on their grade, but they were urged to do

their best in performing it. The entire test was described briefly. Then a student was asked to walk through the test for demonstration purposes. The test administrator demonstrated the side-step. The wall pass instructions included directions of the technique, with the student demonstrating as instructed.

Two parts of the instructions and procedure can affect the performance of students. The first is the use of the "Go" signal on the fifth side-step so that the subjects know they are to run at that point. As soon as the starting line is touched on the fifth round trip in the side-step item, "Go" is called out. This eliminates the hesitations of some few students who fail to remember instructions. The other part of the test performance affected by instructions is the wall pass. A bounced return is suggested for better control and better speed. These two phases of the instructions were given, with some additional pertinent instructions, in an approximation of the following:

"The side-step must be performed without crossing the feet over. It is a side-step, sliding motion, back and forth. The body faces me throughout the side-step, never turning away. You must touch the line on each trip. I will count for you. As you complete the fifth trip across and back, I will call out 'Go' instead of 'five' -- one, two, three, four, Go! Remember, five side-steps, and then run to the ball in the center of the line.

"The wall pass is best performed by hitting the wall about head high so that the ball will bounce straight back to you on one bounce. This is the fastest way. If you lose the ball, just pick up the extra one to the side and continue. Try not to miss it, but if you do, get the other ball quickly. Remember to stay behind the restraining line to throw. You may cross it to retrieve a ball, but you must return behind it to throw. Remember, ten hits against the wall -- ten. Catch the tenth pass. Catch it, drop it, and run as fast as you can back across the starting line.

"Some of you will be asked to help out by assisting at the wall pass. You will place one ball in each square. When a girl is performing the wall pass, count out loud for her each time the ball strikes the wall so that she can hear you clearly.

"Remember now, five side-steps, then ten wall passes, catch the last one, drop it, and race back across the starting line."

One test administrator gave the test to both groups. Students assisted in counting the wall passes and retrieving balls, and in recording scores. The assistants were rotated. At no time in the use of student assistants was it noted that their tasks were conducted with any real variability or that their work had any adverse effects on the objectivity of the test.

Statistical Procedures

The skills grades in the four units for the seventh graders were totaled for a composite skill score. The Classification Test score was recorded to the nearest tenth of a second. The Pearson Product Moment method of correlation was applied to the composite skills scores and the Classification Test scores.

The skills grades in the three units for the ninth graders were totaled for a composite skill score. The Classification Test score was recorded to the nearest tenth of a second. The Pearson Product Moment correlation method was applied to these scores as with the seventh graders.

VII. ANALYSIS OF DATA

Pearson Product Moment Correlation Coefficients were computed as a measure of validity for each of the two test groups, correlating their scores on the Junior High School Classification Test for Girls and their composite skills grades assigned by primarily objective means. The results are shown in the table that follows:

TABLE IV

VALIDITY COEFFICIENTS FOR THE CLASSIFICATION TEST

GROUP	NUMBER	VALIDITY r
Ninth Grade	47	.6430
Seventh Grade	36	.3849

Previous testing showed a reliability score for the Classification Test of .7482 for a group of ninety-five ninth grade girls.

The final test form, the Junior High School Classification Test for Girls, was found to be acceptable for ninth grade girls with a validity of .6430 and a reliability of .7482. The validity coefficient for seventh grade girls decreased from .5256 on Test I with a ten-foot wall pass to .3849 on the revised test with a fifteen-foot wall pass.

The large difference in the validity of the Classification Test for seventh and ninth grade girls was not expected. The objectivity of skills grades was the determinant of the classes selected for testing and no eighth grade classes were included. There is, therefore, no real basis for analysis of the value of the final test form for eighth grade girls. The validity of Test I for eighth grade girls was .6155, as shown in Table III, page 38. Further testing would be necessary to determine the most desirable test form and distance for the wall pass for this grade level.

CHAPTER V

CONCLUSIONS

The Junior High School Classification Test for Girls is an acceptable classification device for ninth grade girls. The validity coefficient was .6430 using a composite of skills grades as the criterion. The reliability coefficient was .7482 computed by the test, re-test method. It was administered to a class of forty-seven girls in a class period of fifty minutes, using approximately thirty-five minutes for the actual administration. It may be administered by one test administrator. Objectivity is accepted on this test, as subjective judgment is not a factor in the test administration. The equipment needed is common to most physical education programs. The floor markings are simple. The test meets the desired standards for ninth grade girls.

The final test form was not as successful for seventh grade girls. The use of the same test with a ten-foot wall pass might prove acceptable, though a validity measure on a similar form was but .5256. Further revision of the test structure might enhance the development of an acceptable test for seventh grade girls. Further testing would also be necessary to ascertain the value of this test or a similar form for eighth grade girls.

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APPENDIX A

ABILITY RATINGS

INSTRUCTIONS

With the rating scales provided, please indicate in the appropriate columns of the score charts the numerical rating for each unit in which the students have been instructed. Every student will not be perfectly described in the three-point scale. Please place the student in the category most appropriate in your judgment.

These ratings are concerned with skill and ability in the specified activities. Attitude, sportsmanship and behavior are not under consideration.

The progression through grade levels in the rating scales for team sports is primarily in proficiency in skills and game ability rather than through the addition of new skills. Thus, the comparative terms used in the scales are relative to the grade level involved rather than absolute throughout the three year program.

In tumbling the progression through grade levels occurs primarily through the addition of new and more difficult stunts to be performed. Thus, this rating scale is applicable at each grade level according to the content of that tumbling unit.

RATING SCALE

7th Grade

VOLLEYBALL

3	Good volley with good control; deep, controlled serve; shows good awareness of team-play and strategy in play.
2	Good volley, though inconsistent; good serve, though inconsistent; shows some awareness of team-play and strategy in play.
1	Inconsistent and uncontrolled volley; weak, uncontrolled serve; shows little awareness of team play and strategy in play.

SPEEDBALL

3	Adequate control of dribble and passes; effective defensive techniques; aggressive; shows an understanding of position play; shows some knowledge of game play and strategy; displays knowledge of the responsibilities of her position.
2	Inconsistent control of dribble and passes; adequate defensive techniques; shows some understanding of position play, game play and strategy.
1	Lacks control of dribble and passes; weak defensive techniques; poor position play; shows little understanding of game play and strategy.

BASKETBALL

3	Adequate lay-up shot; some accuracy in set-shooting; fairly reliable ball handling; alert and aggressive; effective guarding techniques; shows an understanding of team play, rules and strategy.
2	Some accuracy with the lay-up shot; some accuracy in set-shooting; inconsistent ball handling; adequate guarding techniques; shows some understanding of team play, rules and strategy.
1	Little accuracy with the lay-up shot or set-shot; poor ball handling; weak guarding techniques; shows little understanding of team play, rules and strategy.

RATING SCALE

7th Grade

TUMBLING

3	Performs most of the rolls and stands taught well with good form; good balance; shows knowledge of the stunts taught.
2	Performs some rolls and stands taught with good form and most with acceptable form; shows knowledge of the stunts taught.
1	Fails to perform most rolls and stands taught with acceptable form; shows knowledge of few of the stunts taught.

ROPE JUMPING

3	Jumps consistently well with good rhythm and speed; can perform most of the variations taught.
2	Jumps well with rhythm; lacks consistency; can perform some of the variations taught.
1	Jumps inconsistently with little rhythm; can perform few of the variations taught.

RATING SCALE

8th Grade

VOLLEYBALL

3	Controlled, good volley; low, deep, controlled serve; team play concept displayed; uses strategy and placement in play; spikes if height allows.
2	Good volley; adequate serve; shows awareness of team play and strategy in play.
1	Inconsistent volley, lacking control; inconsistent serve; shows little team play or strategy.

SPEEDBALL

3	Controlled dribble; controlled passes; good defensive techniques; aggressive; good position play; shows knowledge of game play and strategy; displays knowledge of the responsibilities of her position.
2	Adequately controlled dribble and passes; adequate defensive techniques; shows some understanding of position play; shows a general understanding of game play and strategy.
1	Little control on dribble and passes; weak defensive techniques; poor position play; shows little understanding of game play and strategy.

BASKETBALL

3	Fairly consistent lay-up shot; some accuracy in set-shooting; reliable ball handling; good guarding techniques; alert and aggressive; shows an understanding of team play, rules and strategy.
2	Inconsistent lay-up shot; some accuracy in set-shooting; inconsistent ball handling; adequate guarding techniques; shows some understanding of team play, rules and strategy.
1	Poor lay-up shot; little accuracy in set-shooting; unreliable ball handling; weak guarding techniques; shows little understanding of team play, rules and strategy.

RATING SCALE

8th Grade

TUMBLING

3 Performs most of the rolls and stands taught well with good form; good balance; shows knowledge of all of the stunts taught.

2 Performs most of the rolls and stands taught with good form and most with acceptable form; shows knowledge of most of the stunts taught.

Fails to perform most of the rolls and stands taught with acceptable form; shows knowledge of few of the stunts taught.

FOLK DANCE

3 Performs most dances well, with rhythm and precision; adept at dance steps; shows knowledge of the dances taught.

2 Performs some dances well, with precision; performs most dances adequately with rhythm; shows knowledge of most of the dances taught.

1 Performs few dances well; lacks rhythm; shows knowledge of few of the dances taught.

RATING SCALE

9th Grade

VOLLEYBALL

3	Fairly consistent, controlled, good volley; low, deep, fairly consistent, controlled serve; displays concept of team play; uses strategy and placement in play; spikes if height allows.
2	Controlled, good volley; adequate serve; displays concept of team play; shows awareness of strategy in play.
1	Inconsistent volleys, lacking control; inconsistent serve; shows little understanding of team play or strategy.

SPEEDBALL

3	Controlled dribble; controlled passes; good distance with kicks and passes; good defensive techniques; good position play; aggressive; shows good knowledge of game play and strategy; displays knowledge of the responsibilities of all positions.
2	Adequately controlled dribble and passes; adequate defensive techniques; good position play; shows a general understanding of game play and strategy.
1	Little control of dribble and passes; weak defensive techniques; poor position play; shows little understanding of game play and strategy.

BASKETBALL

3	Consistent lay-up shot; good accuracy in set-shooting; reliable ball handling; good guarding techniques; alert and aggressive; shows a real understanding of team play; shows a knowledge of rules and game strategy.
2	Inconsistent lay-up shot; some accuracy in set-shooting; fairly reliable ball handling; adequate guarding techniques; shows some understanding of team play; shows knowledge of rules and some understanding of game strategy.

RATING SCALE

9th Grade

BASKETBALL

1	Inconsistent lay-up shot; poor set-shot; weak guarding techniques; unreliable ball handling; shows little understanding of team play, rules or game strategy.

APPENDIX B

SKILLS SCORES AND THE CLASSIFICATION
TEST SCORES FOR NINTH GRADE GIRLS

SUBJECT NUMBER	SKILLS SCORES Volley-ball	Basket-ball	Tum-bling	COMPOSITE SKILLS SCORE	CLASSIFICATION TEST SCORE IN SECONDS
1.	89	94	94	277	38.1
2.	89	87	70	246	39.4
3.	91	94	92	277	37.8
4.	85	85	95	265	42.9
5.	84	92	98.5	274.5	39.7
6.	86	93	78	257	41.8
7.	86	83	92	261	44.5
8.	82	82	70	234	47.6
9.	89	85	88	262	41.5
10.	84	86	75	245	43.4
11.	72	78	65	215	45.5
12.	84	76	75	235	45.2
13.	85	83	96	264	44.8
14.	87	91	69	247	47.5
15.	90	90	89	269	37.2
16.	91	89	75	255	41.5
17.	74	78	69	221	50.0
18.	79	78	71	228	42.9
19.	81	91	75	247	42.3
20.	91	89	90	270	46.4
21.	87	94	82	263	39.4
22.	77	83	71	231	43.9

NINTH GRADE (continued)

SUBJECT NUMBER	SKILLS SCORES Volley-ball	Basket-ball	Tum-bling	COMPOSITE SKILLS SCORE	CLASSIFICATION TEST SCORE IN SECONDS
23.	82	86	85	253	40.2
24.	84	91	92	267	39.7
25.	89	92	92	273	37.7
26.	82	91	92	265	41.7
27.	90	92	98	280	38.2
28.	74	85	72	231	46.0
29.	94	91	72	257	42.1
30.	91	90	94	275	38.2
31.	91	86	97.5	274.5	45.4
32.	96	91	100	287	36.5
33.	87	84	97.5	268.5	45.8
34.	94	89	98.5	281.5	39.1
35.	91	85	88	264	38.1
36.	82	88	77	247	47.0
37.	80	87	85	252	42.7
38.	89	91	85	265	45.5
39.	77	86	78	241	46.3
40.	84	75	81	240	40.0
41.	91	86	75	252	42.4
42.	91	89	81	261	42.8
43.	84	82	71	237	45.0
44.	85	85	92	262	40.6

NINTH GRADE (continued)

SUBJECT NUMBER	SKILLS SCORES Volley-ball	Basket-ball	Tum-bling	COMPOSITE SKILLS SCORE	CLASSIFICATION TEST SCORE IN SECONDS
45.	79	87	71	237	42.6
46.	87	85	71	243	44.2
47.	79	89	65	233	45.5

SKILLS SCORES AND THE CLASSIFICATION
TEST SCORES FOR SEVENTH GRADE GIRLS

SUBJECT NUMBER	SKILLS SCORES Volley-ball	Speed-ball	Basket-ball	Tum-bling	COMPOSITE SKILLS SCORE	CLASSIFICATION TEST SCORE IN SECONDS
1.	93	85	92	88	358	41.8
2.	84	92	93	95	364	48.5
3.	90	80	85	85	340	47.6
4.	78	85	80	85	328	48.8
5.	78	85	86	85	334	43.4
6.	85	97	85	85	352	42.2
7.	90	85	88	85	348	47.7
8.	80	87	85	85	337	42.7
9.	83	92	89	85	349	42.9
10.	85	92	95	85	357	38.2
11.	81	85	85	85	336	47.6
12.	82	85	92	85	344	47.2
13.	83	87	95	85	350	43.9
14.	90	87	92	85	354	41.8
15.	86	97	84	65	332	44.4
16.	85	85	92	95	357	46.5
17.	79	92	85	95	351	45.8
18.	77	85	79	85	326	44.2
19.	86	75	90	85	336	40.7
20.	77	85	85	85	332	45.8
21.	75	85	84	85	329	44.8
22.	86	85	87	68	326	43.4

SEVENTH GRADE (continued)

SUBJECT NUMBER	SKILLS SCORES Volley-ball	Speed-ball	Basket-ball	Tum-bling	COMPOSITE SKILLS SCORE	CLASSIFICATION TEST SCORE IN SECONDS
23.	75	85	79	85	324	47.6
24.	86	85	85	85	341	45.7
25.	84	85	91	85	345	41.6
26.	93	92	84	85	354	41.0
27.	77	92	83	85	337	51.9
28.	85	85	85	85	340	44.9
29.	90	85	89	85	349	39.8
30.	87	82	86	85	340	47.1
31.	82	85	89	85	341	42.6
32.	83	85	80	85	333	47.9
33.	79	85	85	85	334	51.7
34.	83	85	75	85	328	51.4
35.	85	85	86	85	341	44.6
36.	89	92	89	85	355	41.7