

A STUDY TO DETERMINE THE PREDICTABILITY OF THE
JUMP AND REACH TEST IN COMPARISON WITH THE
PIERCE BASKETBALL CLASSIFICATION INDEX

by

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A THESIS

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PIERCE BASKETBALL CLASSIFICATION INDEX

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ABSTRACT

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Purpose

It was the purpose of this study (1) to determine the relationship between the Jump and Reach Test and the Pierce Basketball Classification Index; (2) to determine the relationship between the Jump and Reach Test and the coaches' ranking of players; and (3) to determine to what extent the Jump and Reach Test predicts basketball ability.

Methods

The methods used to obtain data for this study were (1) administering the Jump and Reach Test; (2) administering the battery of tests included in the Pierce Basketball Classification Index to determine the subject's Physical Test Index; (3) compiling a Personal History Index based on such factors as weight, height, age, grade and experience; (4) combining the Physical Test Index and Personal History Index to determine the Pierce Basketball Classification Index; (5) comparing the test results of the Jump and Reach Test with the Coaches' Ranking of Players; and (6) comparing the Pierce Basketball Classification Index with the Coaches' Ranking of Players.

Findings

From the evidence presented in this study the following conclusions seem evident:

1. The Jump and Reach Test is a measure of potential rather than a measure of basketball experience.
2. The P. B. C. I. seems to be geared more to a boy having experience in basketball fundamentals such as dribbling and shooting.
3. A correlation between the Jump and Reach Test and the P. B. C. I. and between the Jump and Reach Test and the Coaches' Ranking is consistently higher for the guards.
4. The Jump and Reach Test is a good single test predictor, but is neither foolproof nor as dependable as a battery of tests.

In terms of the findings of this study the following recommendations seem in order.

1. A six or seven year control group study using the Jump and Reach Test on junior high school boys and correlating their scores with later high school performance seems advisable.
2. It may be advisable for coaches to administer the Jump and Reach Test to boys prior to any organized basketball participation in order to determine their potential and encourage further development.

3. The Jump and Reach Test may be used to predict the potential of the boys who might be selected to play guard.

Approved:

Supervising Professor

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CHAPTER I

THE PROBLEM

Selecting the players for the team is a very important job of a coach as he is looking for boys with speed and height, coupled with ball handling ability, shooting ability, rebounding ability, and defensive ability. The task of detecting these talents, developing them to their fullest, and selecting the most talented five boys who will be supported by the best possible replacements, is of major concern.¹

Such factors as aggressiveness, desire, willingness to work and to sacrifice are difficult if not impossible to accurately measure. Certain vital information as age, height, weight, and experience are readily available to the coach. Ability to perform specific physical skills required in playing basketball can be measured. This study was an attempt to determine the predictability of the Jump and Reach Test and to compare it to the Pierce Basketball Classification Test in predicting basketball ability. The comparison may result in substituting the Jump and Reach Test for the Pierce Basketball Classification Test.

¹John W. Bunn, The Basketball Coach Guides to Success (Englewood Cliffs, New Jersey: Prentice-Hall, 1961), p. 99.

Statement of the problem. It was the purpose of this study

- (1) to determine the relationship between results of the Jump and Reach Test and the Pierce Basketball Classification Test;
- (2) to determine the relationship between the results of the Jump and Reach Test and the coaches' ranking of players; and
- (3) to determine the extent to which the Jump and Reach Test would predict basketball ability.

Importance of the study. An attempt was made to use the Jump and Reach Test to determine if it would prove valid in predicting basketball ability. The Pierce Basketball Classification Test consists of ten individual test items which are time consuming and measure experience as well as ability. The procedure for the Jump and Reach Test is simple and consumes little time. This test is used to measure basketball potential rather than basketball experience. If the Jump and Reach Test has predictive validity, it may be used by coaches in evaluating the potential of their players. If there is a high correlation between the results of the Jump and Reach Test and the Pierce Basketball Classification Test, the Jump and Reach Test may be used instead of the Pierce Basketball Classification Test to predict the basketball ability of prospective players. The results of the test could be utilized to encourage players who possess basketball ability to reach their full potential.

Methods of investigation. Information and data were obtained from one hundred high school boys by (1) giving the Pierce Basketball Classification Test; (2) determining each player's Physical Test Index from the results of the Jump and Reach Test, the Basketball Shoot Test, the Obstacle Dribble Test, the Shuffle Step Test, the Dribble and Shoot Test, the Ball Bounce Test, the Free Throw Test, the Thirty-five Foot Shoot Test, the Two Hundred Foot Forward Run Test, and the One Hundred Foot Backward Run Test; (3) determining each player's Personal History Index from his height, age, weight, grade, and basketball experience; (4) determining each player's Basketball Classification Index from his Physical Test Index and his Personal History Index; (5) determining each player's Jump and Reach Index from the results of the Jump and Reach Test; (6) grouping each school's players as to position, post men and guards; (7) having each coach rank his players according to position; (8) ranking each school's players according to the Basketball Classification Index and ranking them according to the Jump and Reach Index; (9) comparing the Basketball Classification Ranking with the Coaches' Ranking of players; (10) comparing the Jump and Reach Ranking with the Coaches' Ranking of players; (11) comparing the Basketball Classification Ranking with the Jump and Reach Ranking.

CHAPTER II

REVIEW OF THE LITERATURE

Material regarding tests and measurement in physical education and athletics points out that research has been limited largely to a variation or modification of existing tests. The various basketball tests are overlapping in many areas. For example, following a similar procedure and producing the same result, Edgren, Johnson, and Knox all use a speed dribble test. The majority of basketball skill tests are based upon the opinions of their authors, unsubstantiated by scientific evidence.¹

A number of basketball tests with varying degrees of predictability exist for use in boys' physical education programs. Edgren was the first to present such a test based upon statistical analysis.² Working with college men, Edgren devised a test of ability in the fundamentals of basketball in individual play that suggests the possible direction for developing a truly valid test, even though the test is not completely standardized. The following test items were included in Edgren's test.

¹H. Harrison Clarke, Application of Measurement to Health and Physical Education (Englewood Cliffs, New Jersey: Prentice-Hall, 1961), p. 330.

²Harry D. Edgren, "An Experiment in the Testing of Ability and Progress in Basketball," Research Quarterly, Vol. III, No. 1 (March, 1932), 159.

1. Speed pass. Make and catch ten passes from behind an eight-foot restraining line.
2. Accuracy pass. Execute five passes, each with chest push, underhand, two-hand shoulder, and one-hand overhead hook to a three-zone rectangular target.
3. Pivot and shoot. Make five pivot and shoot attempts from beyond foul circle.
4. Speed dribble. Dribble around five chairs spaced six feet apart, beginning fifteen feet from starting line and back.
5. Dribble and shoot. Dribble from one side of basket, out across foul line, to other side, repeating five times.
6. Accuracy shooting. Make ten free throw attempts.
7. Opposition shooting. Attempt five baskets while guarded.
8. Ball handling. Make and catch ten passes moving back and forth laterally.

Edgren's report did not give reliability coefficients. A validity coefficient of .77 was obtained between the test battery and the criterion, which consisted of the subjective rating of the performances of players by Edgren's researchers on organized teams following two months of instruction in basketball fundamentals and two weeks of actual play.³

³Harry D. Edgren, "An Experiment in the Testing of Ability and Progress in Basketball," p. 159.

Money devised a test to aid the coach in selecting his squad from a large number of students. The test also provided an incentive to players for all-round development in the game by adding variety and increasing interest in daily practices. The tests were divided into the following seven parts: physical efficiency, speed and coordination, accuracy in passing, accuracy in shooting, dribble and shoot, pivot and shoot, and competitive shooting. There was no report of the battery's validity or reliability.⁴

Willgoose discussed another basketball test constructed by L. William Johnson, who experimented with nineteen tests, checking for validity and reliability.⁵ Two batteries of tests were proposed to measure basketball ability and potential basketball ability. The ability test includes the following items.

1. Field goal speed test. Upon signal, the subject makes as many baskets as possible in thirty seconds, starting any place under the basket.
2. Basketball throw for accuracy. Subject makes ten baseball or hook passes at a wall target forty feet away. The target is a rectangle sixty inches wide by forty

⁴C. W. Money, "Test for Evaluating the Abilities of Basketball Players," Athletic Journal, Vol. XLV, No. 3 (November, 1933), pp. 32-34. Vol. XLV, No. 4 (December, 1933), pp. 18-19.

⁵Carl E. Willgoose, Evaluation in Health Education and Physical Education (New York: McGraw-Hill, 1961), pp. 227-228.

- inches high, starting fourteen inches from the floor and containing a forty by twenty-five inch and a twenty by ten inch rectangle. The rectangles, including the line, score one, two, and three points from outside in.
3. Dribble test. Subject starts from right side of a six-foot-long starting line and dribbles alternately left then right around four hurdles and returns in similar manner around starting line and continues for thirty seconds. A point is scored each time a zone (either side of a hurdle or end of the starting line) is passed, making ten possible points in a round trip.

The three-item scores were totaled to give the battery score, which in the developmental study ranged from sixteen to sixty-eight with a median of forty-two. Coefficients of .88 and .89 were reported for validity and reliability of the ability test, respectively.⁶ Authors Barrow and McGee published a table of norms for the Johnson Basketball Test.⁷ These norms for junior high school boys were determined by Theodore Jacobson. According

⁶H. Harrison Clarke, Application of Measurement to Health and Physical Education, pp. 331-332.

⁷Harold Barrow and Rosemary McGee, A Practical Approach to Measurement in Physical Education (Philadelphia: Lea and Febiger, 1964), pp. 278-279.

to Meyers and Blesh a serious drawback of the use of the Johnson Basketball Ability Test is its lack of availability.⁸

Robert Knox has developed a basketball battery composed of speed dribble, wall bounce, dribble shoot, and penny-cup tests.⁹ Reliability coefficients for various test items ranged from .58 to .90; for the total battery the coefficient was .88. The criterion for validating the test was success in making a ten-man high school varsity basketball squad competing in an Oregon district tournament. Grouped according to basketball ability, boys were compared at eight "B" league high schools composing the district organization. Boys were classified as non-players, substitutes, and first-team members. The tests were given to all boys in these schools during the second week after regular basketball practice had started. Knox points out that the test is much more effective when used with experienced players or varsity groups. Scoring of the test was accomplished by adding together directly the scores made on the four tests. The score in each instance was the number of seconds required to complete the test. Directions for administering the test follow.

⁸Carlton R. Meyers and T. Erwin Blesh, Measurement in Physical Education (New York: Ronald Press Company, 1962), p. 341.

⁹Robert D. Knox, "Basketball Ability Tests," Scholastic Coach, Vol. XVII, No. 3 (March, 1947), p. 45.

1. Speed dribble. Standing with hands on knees behind starting line where ball is placed, upon signal, the subject dribbles around four chairs, as in the Johnson Test, ending at the starting line. Chairs are placed fifteen feet apart, beginning with the first chair, which is placed twenty feet from the starting line.
2. Wall bounce. The subject stands with his toes behind a line five feet from a wall. The object of the test is to ascertain how long it will take him to chest-pass the ball against the wall and catch it fifteen times. Test is repeated if any rebound requires subject to take more than one step in recovery.
3. Dribble shoot. From a starting line on right side line of the court, sixty-five feet from the basket, upon signal, the subject dribbles around three chairs, makes a basket, and returns to the starting line by dribbling around the chairs. The chairs are arranged so as to divide the sixty-five feet distance into four equal segments.
4. Penny-cup test. Standing backwards behind the starting line, upon signal, the subject turns to run across a "signal line" (eight feet from start) to finish line (twenty feet from start) on which are placed three cups--right, white, and blue--spaced five feet apart.

At the signal line, the examiner calls out the color of cup into which the testee should drop the penny he is holding. The time elapsed until penny drop is heard represents the score for one trial.

The seconds required to complete all of the four tests constitute the final score.

The results of the Knox study were as follows: (1) There was eighty-nine per cent agreement between the results of the basketball test and squad membership for tournament play; and eighty-one per cent agreement with membership on the first team. (2) The six members of the "all-star" team achieved total scores on the test that were not reached by ninety-five per cent of the 254 boys included in the study. (3) Of the twenty-four members of the Eugene High School basketball squad, the total scores obtained on the test agreed with the eventual selection of players taken to the Oregon State Tournament in five out of seven cases as to squad membership and five out of five cases as to membership on the first team.

Hill administered the Knox Basketball Ability Test to ninety-two students to determine its use as a selective measure in basketball. Hill found that the Knox Test indicated significant differences among experienced player groups. A correlation coefficient of .275 was found on the retained varsity. Freshman

ability scores and subject ratings were compared and a correlation coefficient of .459 was found.¹⁰

Belichick administered the Knox Basketball Test as prescribed by Knox to members of a college basketball team at the beginning of the season. Members of the college team were then charted throughout the season and their performance of these same skills recorded. When the season was over Belichick found the player who finished eighth on the test had the highest over-all game performance rating and the player who performed best on the test ranked fifth in game performance. These findings prove there is little comparison between results on the Knox Basketball Ability Test and the same skills as performed in actual competition.¹¹

Loose tested the members of the "A" and "B" basketball teams of six high schools. The "A" team had a low correlation of .108. He found that the Knox test did not show strong enough correlations to predict team success and was not a good device to predict all-league athletic rosters. Loose stated that there were so few correlations that were significant at the .05 level that it would

¹⁰Leo James Hill, "Determining Basketball Ability Through the Use of a Basketball Skill Test," (unpublished Master's thesis, State College of Washington, 1956), p. 45.

¹¹S. Belichick, "Varsity Play and Test Results in Basketball," Athletic Journal, Vol. XXXIII (November, 1952), pp. 22.

not be feasible to use any part of the Knox Test in preference to the whole to determine basketball ability.¹²

Clarke reported that Glines and Petersen used the Knox Basketball test to equate students for basketball teams with the university men's physical education service classes.¹³ The competition between equated teams was very close. They also obtained a correlation of .89 between scores on the basketball test and the total points the participants scored in competition throughout the course. Glines also administered the Knox test early in the season to all boys in the high school at Hamilton City, California. Seventeen of the highest twenty boys on the test made either the varsity or junior varsity basketball teams; the five boys with the highest scores on the test eventually formed the starting lineup on the varsity team.

Boyd, McCachren, and Waglow administered the Knox Basketball Test to forty-two candidates for the University of Florida junior varsity basketball squad. A bi-serial correlation coefficient of .96 was obtained between scores on the test and those who made and those who were eventually cut from the squad. The correlations.

¹²W. A. Robert Loose, Jr., "A Study to Determine the Validity of the Knox Basketball Test," (unpublished Master's thesis, Washington State University, 1961), p. 26.

¹³H. Harrison Clarke, Application of Measurement to Health and Physical Education, p. 333.

between test scores and the coach's ratings of each squad member's basketball ability were low.¹⁴

Bunn described a modification of the Knox Test made by Vernon Cox.¹⁵ Neither scientific authenticity nor norms were available. Cox used the test to help select players for the college freshman and varsity squads. The tests were designed to test various abilities of the players in the fundamental skills of basketball. These tests were able to determine a player's ability in speed, coordination in dribbling, passing and receiving, and his ability to respond to commands. They were administered after two weeks of practice on fundamentals and conditioning exercises. Directions for administering the tests follow.

1. Alternating lay-up shot. The subject is given a basketball and instructed to make ten lay-ups alternating from side to side of the basket. The score is the amount of time taken to make ten lay-ups.
2. Wall bounce test. A line is marked on the floor five feet from the wall and parallel to it. The subject stands behind the wall, with heels on the floor, and

¹⁴Clifford A. Boyd, James R. McCachren, and I. F. Waglow, "Predictive Avility of a Selected Basketball Test," Research Quarterly, Vol. XXVI, No. 3 (October, 1955), p. 364.

¹⁵John W. Bunn, The Basketball Coach Guides to Success (Englewood Cliffs, New Jersey: Prentice-Hall, 1961), pp. 106-111.

bounces the ball against the wall fifteen times as rapidly as possible. His score is the number of seconds the process requires. If any rebound is such that the subject has to take more than one step to recover it, the score is considered invalid and the test repeated.

3. Penny-cup test. Standing backwards behind the starting line, upon signal, the subject turns to run across a "signal line" (eight feet from start) to finish line (twenty feet from start) on which are placed three cups--red, white, and blue--spaced five feet apart. At the signal line, the examiner calls out the color of the cup into which the testee should drop the penny he is holding. The time elapsed until penny drop is heard represents the score for one trial. The process is repeated four times. The score is the sum of the times in the four repetitions.
4. Dribble maze. An obstacle course sixty feet in length is divided at fifteen foot intervals by chairs. At the signal, the subject dribbles alternately right then left around the four chairs and returns in similar manner to the starting line. The score is the time elapsed from the signal until the subject crosses the starting line.

5. Dribble shot test. From a starting line on the right side line of the court, sixty feet from the basket, upon signal, the subject dribbles around three chairs, makes a basket, and returns to the starting line by dribbling around the chairs. The chairs are arranged so as to divide the sixty feet distance into four equal segments. Subject must make a goal before returning to start. The score is the time elapsed from starting signal until the subject crosses the starting line.

The Cox Basketball Rating Tests were scored according to time taken to complete the test.

Lehsten experimented with a variety of items testing various motor skills as well as activities fundamental to the game of basketball.¹⁶ As a result, eight items were finally selected to comprise the original test battery. The test items were administered to eighty-six pupils in physical education classes.

To determine the validity of the eight items, ratings made by five judges were correlated with the test scores, resulting in a correlation coefficient of .80. In order to ascertain whether or not the battery of eight tests could be cut down to facilitate testing, composite scores of the five items which had the highest

¹⁶Nelson Lehsten, "A Measure of Basketball Skills in High School Boys," The Physical Educator, Vol. V, No. 5 (December, 1948), p. 103.

individual validity coefficients were correlated against the total of the eight tests. A correlation coefficient of .968 was obtained, indicating that the five selected tests together were measuring to a high degree the same thing which the battery of eight tests were measuring.

On the basis of these results, Mathews recommended that the following five items of the Lehsten Test be used to measure basketball playing ability in high school boys.¹⁷

1. Baskets per minute. The subject starts shooting at the foul line, but shots may be taken from any place on the court.
2. Forty-foot dash. The subject takes a position behind the out-of-bounds line at the end of the floor. He begins from an upright position on the signal "go" and runs the forty-foot course across the finish line as fast as possible. The score is recorded to the nearest tenth of a second.
3. Wall bounce. A rectangular target is painted on a smooth-surfaced wall, two feet wide by four feet high with the lower limit of the rectangle three feet above the floor. At a point six feet from the wall target the subject on the command "go" bounces the basketball

¹⁷Donald K. Mathews, Measurement in Physical Education (Philadelphia: W. A. Saunders Company, 1963), pp. 173-174.

against the wall target and catches the rebound (without the ball touching the floor following the rebound) as many times as possible in ten seconds. The ball must hit the wall inside the borders of the rectangular target. The score is the number of times that the ball is caught in rebound from the wall within the ten seconds allotted.

4. Vertical jump. In the jump and reach test a blackened one-fourth-inch plywood board, five feet long and one foot wide, may be used. The board is marked off in half inches and should be mounted on a basketball back-stop, or if mounted on a wall it should be at least six inches out from the wall so the subject will not scrape himself while executing the jump. The jumper toes a line, one foot in front of the board. The index fingers of both hands are chalked with magnesium. The subject reaches as far as possible with heels kept on the floor and makes a mark on the board with the chalked fingers. He next executes three jumps from a crouched position, making a mark each time on the board. The distance from the top of the reach mark to the top of the highest jump mark is recorded as his score. Measurement is taken to the nearest half inch. An assistant should stand on a table alongside of the board so readings may be taken

at eye level, insuring a greater degree of accuracy. The examiner should have a damp cloth to erase the chalk marks after the reading has been recorded.

5. Dodging run. Five three-foot track lanes are laid out eleven yards in length. Hurdle one is placed at the start of lane one; hurdle two is five yards down the track in lane two; hurdle three is seven yards down the track in lane four; hurdle four is nine yards down the track in lane three; hurdle five is at the opposite end of the track in lane five. The subject starts at hurdle one and weaves through the hurdles. After rounding hurdle five, he returns to hurdle one and follows the same path a second time. The score is recorded to the nearest tenth of a second. Only one attempt is allowed for each individual.

Frierhood described a battery of tests useful for motivation, although neither scientific authenticity nor norms are available. The items include (1) passing accurately, (2) pivoting for efficiency and form, (3) speed-control dribbling, and (4) shooting accurately--free throw and dribble shot.¹⁸

¹⁸H. T. Frierhood, "Basketball Progress Tests Adapted to Class Use," Journal of Health and Physical Education, Vol. V, No. 1 (January, 1934), p. 45.

Hughes reported a study comparing the validity of six selected basketball ability tests. The Money, Lehsten, Friermood, Knox, Johnson, and Edgren tests were given to two groups of fifty-one college freshmen and sophomores. The two tests with a sufficiently high mean coefficient were the Money Test with .76 and the Lehsten Test with .61.¹⁹

Stroup studied the basketball game scores of competing teams in thirty-one ten-minute games and compared them with the skill score averages of the team members.²⁰ The skill score averages were computed from a three item test: passing, dribbling, and shooting. It was discovered that the basketball game is an excellent criterion for validating a particular skill test. In the Stroup study approximately eighty-four per cent of the games were won by the team with the higher skill score average.

Later, Stroup studied motion perception and related it to basketball playing ability.²¹ This time he used a five-item skill test. He was able to demonstrate that there is a real difference

¹⁹Lawrence James Hughes, "Comparison of the Validities of Six Selected Basketball Ability Tests," (unpublished Master's thesis, Pennsylvania State University, 1957), p. 97.

²⁰Francis Stroup, "Game Results as a Criterion for Validating Basketball Skill Tests," Research Quarterly, Vol. XXVI, No. 3 (October, 1955), pp. 353-357.

²¹Francis Stroup, "Relationship between Measurements of Field of Motion Perception and Basketball Ability in College Men," Research Quarterly, Vol. XXVIII, No. 1 (March, 1957), pp. 72-76.

between the range of motion perception of basketball players and non-players and that this range is a factor contributing to basketball ability.

Stroup's original three-item test, for which scale score norms are available, is as follows.

1. Basket shooting. The subject stands as near as he wishes to the basket and shoots as many baskets as possible in one minute, retrieving the ball each time himself. There are no penalties, and the score is the number of baskets made.
2. Wall passing. The subject stands behind a line six feet from a flat wall and passes the ball against the wall as many times as possible in one minute. The score is the number of legal passes made in one minute. It is illegal to bat the ball instead of catch it or to move ahead of the restraining line while handling the ball.
3. Dribbling. In this test the subject dribbles the ball alternately to the left and right of bottles placed in line and fifteen feet apart on a ninety-foot court. As he reaches the end bottle, he circles it and continues in this manner for one minute. The score is the number of bottles properly passed in one minute. It is improper to knock over a bottle or to fail to pass a bottle on the proper side.

Voltmer and Watts developed a rating scale for evaluating ability of intercollegiate squad members that might be applied for physical education class purposes. Players are scored during a contest or scrimmage for making a basket or free throw, gaining possession of the ball (such as off the backboard or intercepting a pass), tying up the ball, and gaining possession after a jump ball. Points are deducted for a missed shot, losing possession of the ball, personal foul, his man scores a basket, or he is tied up with the ball. The net score serves to show relative proficiency of players, while an analysis of the scoring chart affords a means of diagnosing individual deficiencies. Little evidence is gained on passing and ball handling ability except as reflected in losing possession of the ball. In applying this scale for team selection, the test authors noted that it discloses the "steady" player as well as the erratic individual who may be highly regarded because of an occasional brilliant play.²²

The Sargent Jump, named after its originator, Dr. Dudley A. Sargent, consists of a vertical leap into the air, and is primarily a test of the ability of the body to develop power in relation to the weight of the individual himself. In this jump, the individual swings his arms downward and backward, taking a crouch

²²E. F. Voltmer and T. Watts, "A Rating Scale of Player Performance in Basketball," Journal of Health and Physical Education, Vol. XI, No. 2 (February, 1940), p. 94.

position with knees bent approximately to a right angle. The subject pauses in this position, to eliminate the possibility of a double jump and leaps upward as high as possible, swinging the arms forcefully forward and upward. Just before the highest point of the jump is reached, the arms should be swung forward and downward, motion being timed to coincide with the height of the jump. The specified arm movements in executing the jump are extremely important, the test developing serious inaccuracies without them. The best of three trials should be recorded.²³

Various techniques may be used for the scoring of the Sargent Jump test, also known as the Vertical Jump or the Jump and Reach test. The measurement of the distance that the tip of the fingers is projected upward from the highest normal reaching position may be determined by the following methods.

1. Some form of "leapmeter," as devised by Carpenter, may be used. The leapmeter consists of an upright stand fitted with an operating level arm, from which the cap or harness is suspended by a cord. The cap is fitted to the subject to be tested. The cord works the arm level, which in turn moves a guide holding a pencil on graph paper, and the height of the jump is recorded in

²³Dudley A. Sargent, "Physical Test of a Man," American Physical Education Review, Vol. XXVI, No. 4 (April, 1921), p. 188.

reduced size. Pressure is exerted on the pencil guide and arm lever by springs or heavy rubber bands.²⁴

2. McCloy found that excellent results in scoring can be obtained by using a sheet of wrapping paper two feet wide and five feet long. Horizontal lines, numbered consecutively from top to bottom, are drawn across the paper one centimeter apart, every tenth centimeter line being drawn in blue, every fifth in red, and all others in black. This paper is fastened to the wall so that the zero line is just below the standing height of the shortest pupil to be tested. Before jumping, the height reached on the paper by the top of the subject's head should be noted. The jump is recorded as the distance between this head position and the highest point of the jump. In administering the test, the examiner should stand on a chair or table and sight across the subject jumps, using a yardstick as a guide.²⁵

3. Cureton used a shorter paper with lines ruled as above which was placed on the wall near the floor with the zero line at approximate ankle height. An elastic band with a button attached is placed on the subject's ankle and adjusted so that the location

²⁴Aileen Carpenter, "An Analysis of the Relationships of the Factors of Velocity, Strength, and Dead Weight to Athletic Performance," Research Quarterly, Vol. XII, No. 1, (March, 1941), p. 34.

²⁵C. H. McCloy, Tests and Measurements in Health and Physical Education (New York: F. S. Crofts and Company, 1939), pp. 64-65.

of the button corresponds with the zero line on the paper. The record of the jump is the point reached by the button at the height of the jump. In using this test, care should be exercised that the knees are fully extended at the height of the jump.²⁶

4. In the fourth method, known as the "chalk jump," the subject holds a short piece of chalk between his fingers and, reaching up as far as possible, makes a short horizontal mark on the wall. He then jumps upward as high as he can and makes another mark as near the peak of his jump as possible. The distance between the two marks is then measured. A variation of this method consists of making the marks with moistened finger tips. In a study of various methods of measuring the Sargent Jump, however, Van Dalen found the chalk and wall jumps to be inaccurate.²⁷

5. Scott and French developed a method of testing the vertical jump. In this test one-inch cloth strips are suspended from a horizontal bar, and spaced at one-inch intervals from each other. Each strip is weighted with a penny at the end nearest the floor under the suspended strips, and reaching with one hand, touches the highest strip that he can. This is recorded under

²⁶Thomas D. Cureton, "Fitness of Feet and Legs," Supplement to the Research Quarterly, Vol. XII, No. 2 (May, 1941), p. 368.

²⁷Deobold Van Dalen, "New Studies in the Sargent Jump," Research Quarterly, Vol. XI, No. 2 (May, 1940), p. 112.

"reaching height." The subject jumps from a stationary position under the bar, and reaches the highest strip that he can. He may start from a crouch if he wishes, but he may not take any steps or preliminary bounces. Any number of trials is allowed, but it is advisable to estimate the approximate place along the scale where the subject's best jump will be, in order to avoid fatigue from too many trials. The score is the difference in inches between the height of the reach and the height of the best jump.²⁸

After requiring adequate practice in the execution of the jump, McCloy obtained a correlation coefficient of .85 between the best jump from two series of three jumps each, performed on different days, and the best from two other series of three jumps each, also performed on two different days. When the correlation of these four jumps was corrected for attenuation, a reliability of .98 was found.²⁹ All experimenters agree that best results are obtained with this test only after the technique of the jump has been carefully taught, and the subjects have been given sufficient practice in which to master it.³⁰

²⁸M. Gladys Scott and Esther French, Measurement and Evaluation in Physical Education (Dubuque, Iowa: William C. Brown Company, 1959), pp. 367-368.

²⁹C. H. McCloy, "Recent Studies in the Sargent Jump," Research Quarterly, Vol. III, No. 2, (May, 1932), p. 235.

³⁰H. Harrison Clarke, Application of Measurement to Health and Physical Education, p. 239.

Patty studied boys trying out for collegiate basketball. He found that the vertical jump distinguished significantly between the varsity and the rejected freshman players, and the successful freshman candidates and the rejected freshman candidates. The test did not distinguish between the varsity and the successful freshman players, nor between the upper and lower fifty per cent of the successful freshman players, nor between the upper and lower fifty per cent of the successful freshman players. Patty stated that this would seem to indicate that the vertical jump does distinguish between successful basketball players and non-successful players; between a select group of basketball players but not between a highly select group as shown by the criteria representing the freshman and varsity basketball teams.³¹

Barrow developed a basketball skill test (1) that can measure status and achievement; (2) that is highly motivating; (3) whose items may be practiced as drills; (4) whose results may be useful in prescribing activity; and (5) whose groups may be classified on the basis of norms.³²

³¹Elbert K. Patty, "The Relationship of Selected Measurable Traits to Success in Basketball," (unpublished Master's thesis, Indiana University, 1953), pp. 95-96.

³²Harold M. Barrow, "Basketball Skill Test," The Physical Educator, Vol. XVI, No. 1 (March, 1959), pp. 26-27.

Norms may be determined as follows. All scores of the 1.5 standard deviation or more above the mean indicate "Excellent." Scores of between 1.5 standard deviation and .5 standard deviation above the mean indicate "Good." Scores between .5 standard deviation above the mean and .5 standard deviation below the mean indicate "Average." Scores between .5 standard deviation and 1.5 standard deviation below the means indicate "Poor." All scores 1.5 standard deviation or more below the mean indicate "Inferior."

The following test items were included in Barrow's test.

1. Wall pass. The player stands with his feet behind the restraining line. He passes the ball against the wall as many times as possible in fifteen seconds. He must use either the two handed or one handed push pass. The final score is the number of times the ball hits the wall in the allotted time.
2. Baskets per half minute. The player stands with the ball in his hands directly beneath the basket or near the basket. On the signal to start, he throws the ball through the basket as many times as possible in thirty seconds. He may use any method of shooting and he may jump as high as he wishes on shots. The final score is the number of baskets made in the thirty second period.
3. Zigzag dribble. Five chairs are utilized. One chair is placed in the middle of a rectangle sixteen feet by ten

feet and the other chairs are placed in each corner. The subject starts in one corner, dribbles around the middle chair, around both end chairs, around the middle chair again, and back around both end chairs until he returns to the starting point. He dribbles the course two times.

Matthews devised a test of basketball ability based on the following skills: ball control and ability to handle the body, shooting, speed and accuracy in dribbling and shooting, rebounding, and passing. The mean correlation coefficients were .815 and .814. The following test items were included in the Matthews test.³³

1. Pivot-shoot, pivot dribble. An eighteen-foot line is measured from the center of the backboard on both sides of the basket at an angle of forty-five degrees to the backboard. A two-foot line is drawn at the end of each of the eighteen-foot lines and perpendicular to them. Two feet beyond the two-foot lines and parallel to them, an additional two-foot line is drawn. A basketball is placed on a chair on each of these additional two foot lines. A heel mark for the rear foot is drawn on the first two-foot line and another heel mark for the front

³³Leslie E. Matthews. "A Battery of Basketball Skills Tests for High School Boys" (unpublished Master's thesis, University of Oregon, 1963), pp. 34-36.

foot is placed twelve inches further out. The procedure is the same at the opposite eighteen foot line except the pivot is on the rear foot toward the inside of the court. The subject stands on the right side of the basket, heels on the marks. On the signal he picks up the ball from the chair, does a rear pivot and shoots at the basket immediately. He recovers the rebound, passes the ball to a catcher at the position he just left and runs to the chair on the left. Once there he follows the same procedure. As the subject returns to his position on the right, the timer announces "Pivot and Dribble." After the rear pivot, the subject dribbles to the basket for a lay-up shot. He again recovers the ball, passes it to the catcher on the right, then runs to the position on the left and follows this same procedure. These two procedures are done alternately for a total of ten shots of which six are pivot and shoot and four are pivot and dribble. The time is kept from the word "go" until the catcher on the left receives the ball on the tenth shot. The time is recorded in seconds. Points are scored with two points for each basket, one point for hitting the rim, and nothing for a complete miss. Penalties are also recorded on the basis of one point for each violation and

are then subtracted from the total score. The violations to be noted are: pivoting in the wrong direction, taking steps after the pivot in the process of shooting, and a bad pass to the catcher behind the chair, that is, causing the catcher to move his feet to receive the ball.

2. Rebound jump. A rebound standard is used with a basketball hoop on the top of an adjustable section of the standard, attached so that the hoop can be turned up on its edge. The hoop is adjusted to a position nine inches above the tip of the hand of the subject outstretched above his head as he stands feet flat on the floor beside the standard. A chair for the basketball is placed at right angles to the center of the hoop standard and two feet away from it. The subject's standing height is taken, to the nearest inch, with his toes against a wall and his feet flat on the floor and with his right hand reaching up as far as possible above his head. This standing height is measured from the floor to the tip of his outstretched fingers. The hoop is then raised to nine inches above his height. On the signal "go," he picks up the ball from the chair, jumps in the air, and carries the ball above an imaginary line drawn through the bottom of the hoop and parallel to the floor. He then shoots the ball through the hoop.

The ball is retrieved by a catcher who passes it to another catcher behind the chair. Two balls are kept in operation so there is always one ball on the chair. The action continues until the signal "stop," is given. The scorer counts the total number of times the ball is put through the hoop in thirty seconds. If the ball is not carried above the bottom of the hoop before the subject shoots, the score is not counted.

3. Wall pass. The subject stands behind a line six feet from a rebound wall which is a vertical, smooth wall with no obstructions and a minimum size of eight feet high and six feet wide. Using a two-handed chest pass, the subject bounces the basketball off the wall as many times as possible in thirty seconds. The subject must catch the basketball each time but can make a pass from anywhere behind the line. If the basketball is dropped in front of the restraining line, it must be retrieved and brought back to the starting position behind the line. On the signal "go" he passes the ball against the wall, catching the rebound. He repeats this as many times as possible until the signal "stop" is given. The score is the number of times the ball hits the wall in thirty seconds.

Correlations were calculated by the rank-order technique. Coefficients of reliability ranged from .86 to .99. Because of this range of coefficients and because of the complexity of the skills to be judged, it was the opinion of the investigator, Matthews, that a panel of judges would be more accurate in rating than a single teacher-coach.

Holland tested 156 high school boys trying out for the basketball team.³⁴ The sixty-yard dash, an adaptation of the Edgren Side-Step Test, pullups, the vertical jump, a speed dribble test, the Penny-cup Test, a shooting coordination test, a wall bounce test, age, height, weight, and previous experience were used to collect data during the first two weeks of basketball practice. Holland found that weight, height, experience, speed, power, ball-handling ability, passing ability, and reaction influence a player's success in basketball. Experience, ball-handling, passing, and shooting ability have the greatest influence on a player's success in basketball. The prediction of successful basketball players from the Basketball Ability Scores was seventy-eight per cent accurate. The accuracy of the prediction of starters was sixty-eight per cent; second team members, forty per cent; and of the All-Star Team, thirty-eight per cent.

³⁴Kenneth A. Holland, "The Predictive Value of Selected Variables in Determining the Ability to Play Basketball in Small High Schools" (unpublished Doctoral dissertation, University of Arkansas, 1963), p. 97.

Smith studied the relationship of selected measures of structure and strength to success in basketball skills of dribbling, passing, shooting, and to total basketball ability.³⁵ He found significant correlations to dribbling ability were sitting height, arm span, shoulder width, left shoulder extension, right shoulder extension, right thigh extension, and left knee extension; significant correlations to passing ability were hand span, shoulder width, right hand grip, right elbow flexion, left shoulder extension, right thigh extension, and left knee extension; significant correlations to shooting ability were height, sitting height, leg length, arm span, hand span, shoulder width, right hand grip, left shoulder extension, and right thigh extension; significant correlations to total basketball ability were height, sitting height, arm span, shoulder width, right hand grip, left shoulder extension, right thigh extension, and left knee extension.

Plinke developed basketball physical skill potential test batteries according to tall and short height classification categories.³⁶ The Three Item Tall Category Battery included the

³⁵Flavious Joseph Smith, "The Prediction of Basketball Ability Through an Analysis of Selected Measures of Structure and Strength" (unpublished Doctoral dissertation, George Peabody College for Teachers, 1962), pp. 103-104.

³⁶John F. Plinke, "The Development of Basketball Physical Skill Potential Test Batteries by Height Categories" (unpublished Doctoral dissertation, Indiana University, 1966), pp. 132-134.

Four Way Boomerang, the Running Jump and Reach, and the Forty Foot Dash Sideward tests.

The Short Category Battery had a validity coefficient of .63 with the classroom divergent groups potential skill ratings. Of the fifteen subjects tested in the competitive team situation, the five short members selected for team membership ranked in the top six in total battery scores. The Tall Category Battery had validity coefficients of .59 with the classroom divergent groups potential skill ratings and .84 with the competitive team member selections.

Pierce experimented with a basketball test of ten items in an attempt to develop a procedure that would be of value to a basketball coach in the selection of the best players for a squad.³⁷ The test included these ten items.

1. Jump and reach. The subject was given a piece of chalk one-fourth inch long. He faced the wall, with both feet flat on the floor, his toes against the wall, reached as high as possible on the wall with both hands above his head and with the chalk made a mark on the wall at the highest point he reached. Next, he stood with his side next to the wall, swung his arms and jumped as

³⁷Paul E. Pierce, "The Construction of Scales for Predicting Ability to Play Interscholastic Basketball," (unpublished Doctoral dissertation, The University of Houston, 1961), p. 32.

high as possible, made a mark on the wall at the highest point he reached. The distance between the chalk marks was measured in inches and fractions of inches. Each boy was given three jumps with the best jump being recorded on his card.

2. Basketball shoot. The subject stood as near the goal as he chose and in any position, on either side of the goal or in front. He was given a basketball to make as many goals as possible in thirty seconds. The number of goals made was recorded on his score card.
3. Obstacle dribble. Using eleven chairs, an obstacle course thirty feet in length was arranged. Three chairs were placed side by side, twelve feet away two more chairs were placed side by side, six feet away two additional chairs were placed side by side, six feet away two additional chairs were placed side by side, six feet away two more chairs were placed side by side and six feet away from the last two chairs, two more chairs were placed side by side. The subject was given a basketball and instructed to stand on either side of the first three chairs. On the signal "go," the subject dribbled a zig-zag path through the obstacle course for a period of thirty seconds. The number of chairs he dribbled past during this thirty second period, was recorded on the score card.

4. Shuffle step. The subject placed his left foot on one of the lines forming the free throw lane. On the signal "go," he shuffled or ran across the free throw lane and placed his right foot on the opposite line. He should go back and forth across the free throw lane for thirty seconds touching one line with his left foot, and the other line with his right foot. The number of times he touched either line was recorded on the card.
5. Dribble and shoot. A chair was placed on each end of the free throw line, inside the lines forming the free throw lane. The subject was given a basketball and stationed directly under the basket. On the signal "go," he dribbled around both chairs and drove in for a lay-up shot. He retrieved the ball after the goal was made and dribbled around the chairs again and made another goal. This continued for thirty seconds. The goal had to be made before the subject could continue his dribble around the chairs. For each chair dribbled around he received one point, and for each goal made he received three points. For each circle around both chairs plus a goal made five points were scored.
6. Free throw. The subject was given ten free throws. The number made was recorded.

7. Thirty-five foot passing and shooting. A chalk line was drawn on the floor thirty-five feet from the basket. The subject was given a ball, and while standing behind this thirty-five foot line, he shot at the goal, using both hands, one hand, or throwing the ball at the basket in any manner he chose. If the ball hit the rim of the basket, it counted five points; if the ball hit the backboard then hit the basket on the rebound, it counted three points; if the ball hit the backboard only it counted one point; if the ball did not hit the backboard it counted zero. The points from five shots were added.
8. Two hundred foot forward run test. The length of the playing court was measured. The subject stood at one end of the playing court. On the signal "go," he ran the length of the court full speed, around a chair, back to his starting point, around a chair, then to the timer, who was near the center of the court. The subject ran exactly two hundred feet at full speed. His time in seconds and tenths of seconds was recorded.
9. Wall bounce. A chalk line several feet in length and eight feet from a solid wall was drawn on the floor. The subject stood behind the chalk line with a basketball in his hands. On the word "go," he bounced the

ball against the wall for thirty seconds. The number of times the ball hit the wall in this thirty second period was counted. Each time the player moved his feet to catch or pass, he was penalized one point. If the ball got away from him he had to retrieve it and return to his original position before he could start scoring points again. To determine the score, the number of times he moved his feet was subtracted from the number of times the ball bounced against the wall.

10. One hundred foot backward run. Exactly fifty feet was measured from one end of the playing court toward the center of the court and a chalk mark made on the floor. The subject stood at the fifty foot mark with the timer. On the signal "go," he ran backwards to the end of the court fifty feet away, around the person standing on the end of the line, and back to the starting point. The subject must run backwards all the way. His time in seconds and tenths of seconds was recorded.

Pierce found that the players selected on the first team on the basis of the test items were the same as those selected by the coach in 85.6 per cent of the cases. The players selected on the

first or second team on the basis of the test items were the same as those selected by the coach in 97.1 per cent of the time.³⁸

Porter used the Pierce Basketball Classification Index in testing twenty-eight collegiate basketball players. A correlation of .702 was found for the fifteen outside men and a correlation of .887 was found for the thirteen inside men.³⁹

³⁸Paul E. Pierce, "The Construction of Scales for Predicting Ability to Play Interscholastic Basketball," pp. 33-38.

³⁹Archie D. Porter, "An Experiment in the Use of Personal History and Physical Skill Tests in the Selection of Inter-collegiate Basketball Players," (unpublished research paper, East Texas State University, 1966), pp. 15-17.

CHAPTER III

THE PROCEDURE AND RESULTS

In an attempt to compare the effectiveness of the Pierce Basketball Classification Index and the Jump and Reach Test, twenty basketball players from Class AAAA Stroman High School in Victoria, Texas, twenty-two basketball players from Class B Nordheim High School in Nordheim, Texas, and nineteen basketball players and thirty-nine physical education class boys from Class AA Yorktown High School in Yorktown, Texas, were involved in this study. For the purpose of organization the one hundred member group was divided into ten groups based on school attended and team position with sixty-one high school basketball players and thirty-nine physical education class boys categorized as either post men (forwards and centers) or guards.

For the duration of the testing period each subject's information was recorded on the data card included in Appendix I which provided appropriate blanks for the personal information as well as the objective test results. The Personal History Index includes weight, height, age, grade, and experience with this information being used to rate each subject within his group. Each subject's ratings were totaled and this sum was compared and ranked within his group to determine his Personal History Index. The subject's Physical Test Index was determined in the same

manner using the results of the Pierce Basketball Classification Test which was outlined in Chapter II. All of Pierce's objective test items were utilized with the exception of the two hundred foot forward run. The testee ran a distance of fifty feet four times rather than making Pierce's long run of the basketball court. The sum of the Physical Test Index plus the Personal History Index gave the player's Basketball Classification Index.

Each group of boys was ranked according to the Pierce Basketball Classification Test, the Jump and Reach Test, and the coaches' ranking of players. For each group of boys the rank-difference formula of $\rho = \frac{6 \times \sum D^2}{N(N^2-1)}$ was used to determine a correlation coefficient between (1) the Pierce Basketball Classification Test and the Jump and Reach Test; (2) the Pierce Basketball Classification Test and the coaches' ranking of Players, and; (3) the Jump and Reach Test and the Coaches' Ranking of Players.¹ A correlation coefficient was determined on the total of one hundred boys between the Pierce Basketball Classification Test and the Jump and Reach Test.

Table I shows correlation coefficients between the Pierce Basketball Classification Index, hereafter referred to as the P. B. C. I., and the coach's ranking for the ten groups of boys.

¹Henry E. Garrett, Elementary Statistics (New York: David McKay Company, 1964), p. 90.

TABLE I

CORRELATIONS BETWEEN PIERCE BASKETBALL CLASSIFICATION INDEX
RANKINGS AND COACH'S RANKING OF PLAYERS BY GROUPS

Groups	Number	Correlation Coefficient
Yorktown Basketball Guards	12	.89
Yorktown Basketball Post Men	7	.48
Stroman Basketball Guards	12	.83
Stroman Basketball Post Men	8	.80
Nordheim Basketball Guards	11	.69
Nordheim Basketball Post Men	11	.83
Yorktown 10th & 11th Grade P.E. Class Guards	7	.59
Yorktown 10th & 11th Grade P.E. Class Post Men	5	.82
Yorktown 9th Grade P.E. Class Guards	17	.66
Yorktown 9th Grade P.E. Class Post Men	10	.31

An .89 correlation coefficient was determined based on the twelve Yorktown basketball guards. The seven Yorktown basketball post men had a .48 correlation coefficient. This figure for the post men was .41 less than that for the guards. The twelve Stroman basketball guards had an .83 correlation coefficient between the P. B. C. I. and the coach's ranking. The P. B. C. I. and the coach's ranking showed an .80 correlation coefficient based on the eight Stroman basketball post men. Ranking of the eleven Nordheim basketball guards by their coach showed a .69 correlation coefficient when compared to the P. B. C. I. An .83 correlation coefficient was determined between the P. B. C. I. and the coach's ranking of the eleven Nordheim basketball post men. Ranking of the seven Yorktown tenth and eleventh grade physical education class guards by their coach showed a .59 correlation coefficient when compared to the P. B. C. I. The five Yorktown tenth and eleventh grade physical education class post men had an .82 correlation coefficient. The P. B. C. I. and the coach's ranking showed a .66 correlation coefficient based on the seventeen Yorktown ninth grade physical education class guards. Ranking of the ten Yorktown ninth grade physical education class post men by their coach showed a .31 correlation coefficient when compared to the P. B. C. I. The P. B. C. I. when compared with the Coaches' Ranking has a coefficient of correlation range of .31 to .89 with only two scores lying below the .50 level.

Correlation coefficients are shown between the P. B. C. I. rankings and the Jump and Reach Test rankings of the eleven groups of boys in Table II. The twelve Yorktown basketball guards had a .88 correlation coefficient. A .19 correlation coefficient was shown based on the seven Yorktown basketball post men. This figure for the post men was .69 less than that for the guards. The P. B. C. I. and the Jump and Reach Test showed a .76 correlation coefficient based on the twelve Stroman basketball guards and a .54 correlation coefficient based on the eight Stroman basketball post men. The eleven Nordheim basketball post men had a .12 correlation coefficient and the eleven Nordheim basketball guards had a .72 correlation coefficient. This figure for the post men was .60 less than that for the guards. Between the P. B. C. I. and the Jump and Reach Test the seven Yorktown tenth and eleventh grade physical education class guards had a .05 correlation coefficient. The five Yorktown tenth and eleventh grade physical education class post men had a .67 correlation coefficient. A .67 correlation coefficient was determined based on the seventeen Yorktown ninth grade physical education class guards. The ten Yorktown ninth grade physical education class post men had a .33 correlation coefficient. The Jump and Reach Test when compared with the P. B. C. I. had a coefficient of correlation range of .05 to .88 with four scores lying below the .50 level. When the Jump and Reach Test and the P. B. C. I. were administered

TABLE II

CORRELATIONS BETWEEN PIERCE BASKETBALL CLASSIFICATION INDEX
RANKINGS AND JUMP AND REACH TEST RANKINGS BY GROUPS

Groups	Number	Correlation Coefficient
Yorktown Basketball Guards	12	.88
Yorktown Basketball Post Men	7	.19
Stroman Basketball Guards	12	.76
Stroman Basketball Post Men	8	.54
Nordheim Basketball Guards	11	.72
Nordheim Basketball Post Men	11	.12
Yorktown 10th & 11th Grade P.E. Class Guards	7	.05
Yorktown 10th & 11th Grade P.E. Class Post Men	5	.67
Yorktown 9th Grade P.E. Class Guards	17	.67
Yorktown 9th Grade P.E. Class Post Men	10	.33
Entire Study Group	100	.71

to the entire one hundred boys a .71 correlation coefficient was determined. This correlation coefficient compared favorably with an earlier investigation by Dr. Paul Pierce which had a correlation coefficient of .86.

Table III shows comparisons between the Jump and Reach Test and the coach's ranking of players. Ranking of the twelve Yorktown basketball guards by their coach showed an .82 correlation coefficient when compared to the Jump and Reach Test. A .08 correlation coefficient was determined based on the seven Yorktown basketball post men. This figure for the post men was .74 less than that for the guards. The twelve Stroman basketball guards had a .76 correlation coefficient and the eight Stroman basketball post men were .01 less with a .75 correlation coefficient. The Jump and Reach Test and the coach's ranking showed a .28 correlation coefficient based on the eleven Nordheim basketball guards. Ranking of the eleven Nordheim basketball post men by their coach showed a .10 correlation coefficient when compared to the Jump and Reach Test. An .82 correlation coefficient was determined based on the seven Yorktown tenth and eleventh grade physical education class guards and the five Yorktown tenth and eleventh grade physical education class post men had a .17 correlation coefficient. This figure for the post men was .65 less than that for the guards. Ranking of the seventeen Yorktown ninth grade physical education class guards by their coach showed a .62

TABLE III

CORRELATIONS BETWEEN THE JUMP AND REACH TEST RANKINGS
AND COACH'S RANKING OF PLAYERS BY GROUPS

Groups	Number	Correlation Coefficient
Yorktown Basketball Guards	12	.82
Yorktown Basketball Post Men	7	.08
Stroman Basketball Guards	12	.76
Stroman Basketball Post Men	8	.75
Nordheim Basketball Guards	11	.28
Nordheim Basketball Post Men	11	.10
Yorktown 10th & 11th Grade P.E. Class Guards	7	.82
Yorktown 10th & 11th Grade P.E. Class Post Men	5	.17
Yorktown 9th Grade P.E. Class Guards	17	.62
Yorktown 9th Grade P.E. Class Post Men	10	-.84

correlation coefficient when compared to the Jump and Reach Test. The only group in the entire one hundred member study that had a negative correlation was the $-.84$ correlation coefficient based on the ten Yorktown ninth grade physical education class post men. The Jump and Reach Test when compared with the Coaches' Ranking had a coefficient of correlation range of $-.84$ to $.82$ with five scores lying below the $.50$ level.

The P. B. C. I. when compared with the Coaches' Ranking has a coefficient of correlation range of $.31$ to $.89$ with five scores $.80$ or above and eight scores $.59$ or above. A coefficient of correlation range of $.05$ to $.88$ with three scores $.72$ or above and six scores $.54$ or above was determined when comparing the Jump and Reach Test and the P. B. C. I. The widest range of scores was present when the Jump and Reach Test was compared with the Coaches' Ranking. The correlation range was $-.84$ to $.82$ with five scores $.62$ or above and nine scores $.08$ or above. Out of the three tables there was a comparison between guards and post men on fifteen occasions with the correlation coefficients of the guards being higher than the post men twelve times.

CHAPTER IV

THE SUMMARY AND CONCLUSION

The purpose of this study was (1) to determine the relationship between the results of the Jump and Reach Test and the Pierce Basketball Classification Test; (2) to determine the relationship between the results of the Jump and Reach Test and the coaches' ranking of players; and (3) to determine the extent to which the Jump and Reach Test would predict basketball ability.

Information and data were obtained from one hundred high school boys from Stroman, Nordheim, and Yorktown. The boys were divided into ten groups based on school and team position and categorized as either post men (forwards and centers) or guards.

Data for the study was collected by (1) administering a battery of tests to determine the Physical Test Index; (2) compiling a Personal History Index based on such factors as weight, age, height, grade, and experience; (3) combining the Physical Test Index and Personal History Index to arrive at the Pierce Basketball Classification Index; and (4) administering the Jump and Reach Test.

Using the results of these tests each group of boys was ranked according to the P. B. C. I., the Jump and Reach Test and the Coaches' Ranking of Players. In all cases, the correlation

coefficients were determined by the rank-difference formula.¹ A correlation coefficient for each group of boys was run between (1) the P. B. C. I. and the Jump and Reach Test; (2) the Jump and Reach Test and the Coaches' Ranking of Players; (3) the P. B. C. I. and the Coaches' Ranking of Players. A correlation coefficient on the entire one hundred member group between the P. B. C. I. and the Jump and Reach Test was determined.

An analysis of data indicated that when the Jump and Reach Test was compared with the P. B. C. I. the ten individual groups have correlation coefficients ranging from .05 to .88. However, the entire one hundred member group has a .71 correlation coefficient between the Jump and Reach Test and the P. B. C. I.

In comparing the Jump and Reach Test with the Coaches' Ranking of Players, a wide and varied range of correlation coefficients, from a -.84 to .82, were found. By way of assessing this data, we found the coefficient of correlation range between the P. B. C. I. and the Coaches' Ranking to be .31 to .89 with only two of these scores lying below the .50 level. It would appear therefore that the Jump and Reach Test does not compare as favorably as the P. B. C. I. with the Coaches' Ranking of Players.

¹Henry E. Garrett, Elementary Statistics (New York: David McKay Company, 1964), p. 90.

From this study the following conclusions seem evident:

(1) the Jump and Reach Test is a measure of potential rather than a measure of basketball experience; (2) the P. B. C. I. seems to be geared more to a boy having experience in basketball fundamentals such as dribbling and shooting; (3) a correlation between the Jump and Reach Test and the P. B. C. I. and between the Jump and Reach Test and the Coaches's Ranking is consistently higher for the guards; and (4) the Jump and Reach Test is a good single test predictor, but is neither foolproof nor as dependable as a battery of tests.

In terms of the findings of this study the following recommendations seem in order.

1. A six or seven year control group study using the Jump and Reach Test on junior high school boys and correlating their scores with later high school performance seems advisable.
2. It may be advisable for coaches to administer the Jump and Reach Test to boys prior to any organized basketball participation in order to determine their potential and encourage further development.
3. The Jump and Reach Test may be used to predict the potential of the boys who might be selected to play guard.

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APPENDIX

APPENDIX

PERSONAL HISTORY INDEX

Name _____	Score _____	Rank _____
Position _____		
Weight _____	_____	_____
Height _____	_____	_____
Age _____ Yr. _____ Mo. _____	_____	_____
Grade _____	_____	_____
Experience _____		
_____ Squad _____ Letter _____	_____	_____
P. B. C. I. _____		

PHYSICAL TEST INDEX

1. Jump & Reach	_____	_____
2. Basketball Shoot 30 sec.	_____	_____
3. Obstacle Dribble 30 sec.	_____	_____
4. Shuffle Step 20 sec.	_____	_____
5. Dribble & Shoot 30 sec.	_____	_____
6. Ball Bounce 30 sec.	_____	_____
7. Free Throws (10)	_____	_____
8. 35 foot shoot (5)	_____	_____
9. 200 foot forward run	_____	_____
10. 100 foot backward run	_____	_____

DATA CARD FOR BASKETBALL CLASSIFICATION INDEX

Vita was removed during scanning