

AN ANALYSIS OF A BALL CONTROL TEST AND A
BATTERY OF SKILL TESTS TO MEASURE
BASKETBALL ABILITY OF COLLEGE WOMEN

Thesis for the Degree of M. A.

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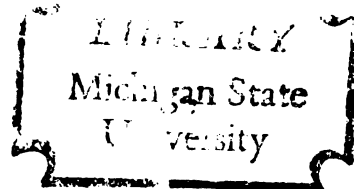
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ABSTRACT

AN ANALYSIS OF A BALL CONTROL TEST AND A BATTERY OF SKILL TESTS TO MEASURE BASKETBALL ABILITY OF COLLEGE WOMEN

By

Anne Elizabeth Irwin

The purpose of this study was to determine the reliability, validity, and relative importance of performance on a ball control test in relationship to basketball ability of college women.

The subjects were thirty-one beginning basketball students at Michigan State University. The subjects were given the ball control test and a subjective basketball ability rating in four successive class periods.

A series of test-retest reliabilities of the ball control test were first computed to determine the most reliable measure of scoring. The best of four trials with a one-second penalty added for each error indicated the highest reliability. Using the Pearson Product Moment correlation, the reliability was .77 with significance at the .05 level.

To assess validity, the ball control test results were correlated with the sum of the judges' ratings. The

validity was $r = -.43$ using the Spearman Rho Rank Order correlation which was significant at the .05 level.

The subjects were also given the modified Edgren wall pass test and nine A.A.H.P.E.R. Basketball skill tests. The ten tests and the ball control test were used as a set of independent variables in a least squares problem with the dependent variable being the sum of the judges' ratings. A least squares equation was calculated each time one of the independent variables was deleted. The skill test which had the least significant beta weight was the next test to be deleted from the battery. A set of least squares equations was also calculated when the ball control test was retained in the equation.

The ball control test was the fourth test deleted from the group. At the time of deletion, it contributed 3.96% to the accounted for 67.15% variability in the sum of the judges' ratings. When the ball control test was held into the battery of skill tests, the beta weight of the ball control test was not significantly different than zero at the .05 level of confidence. The ball control test did not contribute significantly to the batteries of skill tests of basketball ability.

The following conclusions were drawn from the data within the limitations of this study:

1. The ball control test was a reliable (.77) basketball skill test using as the scoring

method the best of four trials with a one-second penalty added for each error.

2. The ball control test was a significantly valid ($-.43$) measure of basketball ability of college women.
3. The ball control test, when combined with ten other basketball skill tests, did not explain significantly any of the accounted for variability in the sum of the judges' ratings of basketball ability.
4. A battery of skill tests with the ball control test included was not a significant predictor of basketball ability of college women.

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CHAPTER I

THE PROBLEM

One of the objectives of teaching in physical education is to develop the skills essential to games. The teaching of skills necessitates the use of adequate instructional tools. Reliable and valid skill tests are instructional tools useful not only for evaluation purposes but for motivational purposes and as a guide to practice.

The game of basketball involves the basic skills of shooting, passing, catching, rebounding, and dribbling.¹ Reliable and valid basketball skill tests are essential instructional tools for student achievement. Review of the literature revealed no reliable and valid basketball skill tests which measured the ability of dribbling the ball. Only two tests, a shooting test and a passing test, were found to have high reliability and moderate validity.² A reliable and valid ball control test and/or a battery of skill tests are needed to adequately measure basketball ability. Since a need exists in this area, it was selected for investigation.

Statement of the Problem

The purpose of this study was to determine the reliability, validity, and relative importance of performance on a ball control test in relationship to basketball ability.

Scope of the Study

The results of this study are applicable only to college age women.

Limitations of the Study

The following limitations were imposed upon the study:

1. Ranging from zero to four years, the mean number of years of experience per subject was one year.
2. Although all subjects had practice trials of the ball control test one class period prior to the collection of the data, variations existed in the total practice time of the ball control test for each subject.
3. The judges rated thirty-one subjects on five skills in three class periods. This time interval may have been too brief to adequately rate all subjects.

Definitions

Ball Control

Ball control is the performance of the skills of passing, catching, rebounding, dribbling, and body control isolated from an actual basketball game.

Basketball Ability

Basketball ability is the performance of the skills of passing, catching, rebounding, dribbling, and body control during a basketball game.

Footnotes--Chapter I

¹M. H. Meyer and M. M. Schwarz, Team Sports for Girls and Women (4th ed.) (Philadelphia: W. B. Saunders Company, 1965), pp. 20-66; see also D. M. Miller and K. L. Ley, Individual and Team Sports for Women (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1955), pp. 300-1; see also A. Paterson, ed., Team Sports for Girls (New York: The Ronald Press Company, 1958), pp. 39-66; see also M. Vannier and H. B. Poindexter, Individual and Team Sports for Girls and Women (Philadelphia: W. B. Saunders Company, 1963), pp. 326-39.

²M. G. Scott and E. French, Measurement and Evaluation in Physical Education (Dubuque, Iowa: Wm. C. Brown Company, 1959), pp. 159-63.

CHAPTER II

RELATED LITERATURE

The purpose of the study was to determine the reliability, validity, and relative importance of performance on a ball control test in relationship to basketball ability. Investigations on reliability and validity of existing basketball skill tests, and investigations on methods of scoring skill tests, are reviewed in the following.

Reliability and Validity of Batteries of Basketball Skill Tests

Leilich¹ found four factors basic to all skill tests in basketball appearing in the literature. The factors were basketball motor ability, speed, ball handling involving passing accuracy and speed, and ball handling involving accuracy in goal throwing.

Miller² selected three tests on the basis of the results obtained by Leilich. The tests were the bounce and shoot test, the half-minute shooting test, and the push pass test. They were correlated with ratings of the four factors obtained in Leilich's study. The bounce and shoot test accounted for 57% of the variance attributed to the four factors, the half-minute shooting for 76%, and

the push pass for 85%. The bounce and shoot test correlated highest with basketball motor ability at .63. The push pass correlated highest with ball handling for accuracy and speed at .76. The half-minute shooting test correlated with speed at .48 and with ball handling for shooting accuracy at .60.

The validity of Young and Moser's³ five-test battery was .86. The test scores of one-hundred and sixty freshman and sophomore college women were correlated with ratings. The battery was the Edgren ball handling test, the wall speed pass test, the free jump test, the bounce and shoot test, and the moving target test.

Dyer, Schunig, and Apgar's⁴ three-test battery had a validity of .83. The subjects were thirty-four college women physical education majors. The tests were the moving target test, the Edgren ball handling test, and the bounce and shoot test.

Johnson⁵ found a validity of .64 when a battery of three tests was correlated with judges' ratings. The half-minute shooting test, the passing test, and the shuttle test also had high reliabilities of .90 and above.

The A.A.H.P.E.R. Project Committee selected a battery of nine tests to cover the fundamental skills of basketball. Percentiles were computed on six-hundred to nine-hundred scores for each age for each sex. There was no battery validity reported.⁶

Reliability and Validity of Basketball
Skill Tests

Scott⁷ reported, in an unpublished study, a reliability of .70 in the first and second trials and .82 stepped up by the Spearman-Brown Prophecy formula on the half-minute shooting test. Two-hundred and thirty-three freshman and sophomore college women were used for this study. Using a sports tests criterion, she reported a validity of .60.

Scott also investigated another test which was a modification of the Edgren test.⁸ She found that the reliability was .70 for the first and second trials and .82 by the Spearman-Brown correction for the sum of two trials. The subjects were two-hundred and thirty-three freshman and sophomore women at the University of Iowa. She found the validity to be .51 when correlated with judges' ratings of ball-handling ability.

Dyer, Schunig, and Apgar⁹ found that the reliability of the moving target test was .91, the Edgren ball handling test was .92, and the bounce and shoot test was .69. The subjects were twenty-five college senior women majors in physical education. Using rankings during a game as the criterion, the validity of each test was .65, .57, and .66, respectively.

Young and Moser¹⁰ examined a battery of tests for measuring basketball playing ability of women. The test-retest reliabilities were .78 for the wall speed pass test,

.98 for the free jump test, .67 for the bounce and shoot test, and .47 for the moving target test. No reliability was reported for the Edgren ball handling test. The subjects were one-hundred and sixty freshman and sophomore college women. The validity of each test was .72, .67, .61, and .59, respectively. The validity for the Edgren ball handling test which was .77 was determined by correlating the test score with instructors' ratings.

Latchaw¹¹ reported the reliability of a wall pass test for speed and accuracy. The test-retest reliability for fifty fourth-grade girls was .94, for fifty fifth-grade girls was .89, and for fifty sixth-grade girls was .83. There was no validity reported.

Kammeyer¹² used achievement in a battery of skill tests as a criterion for validating an adaptation of the Humiston motor ability test. The validity was .69 for one-hundred and twenty-five high school girls.

In a study completed by Anderson and McCloy,¹³ a seven-level rating scale used to evaluate students was analyzed for reliability. The correlation of the sum of the ratings made the first week with those made during the third week was .90. The sports ability rating was correlated with eighteen tests which were administered to one-hundred and fifty-five high school girls. The General Motor Capacity Score had the highest correlation of .81 with the sports ability rating. This score was a combination of

three test scores: the Sargent Jump, the Iowa Brace test, and the ten-second squat thrust.

In the doctoral dissertation of Cunningham,¹⁴ players were rated by four judges during regulation games. The reliabilities of the judges' ratings were high.

In a review of basketball skill tests reporting validities, fourteen out of nineteen tests used judges' ratings while none used skill tests.¹⁵

Methods of Scoring Skill Tests

The literature revealed two attempts to refine the method of scoring which penalized for errors made during the test. In a study by Glassow, Colvin, and Schwarz,¹⁶ a penalty of one second was arbitrarily assigned to each in a dribble and shoot test which was specially constructed by Glassow and Broer.¹⁷ Since frequent fouling in a game was penalized, they felt justified with this penalty. The dribble and shoot test had a reliability of .82 using the scores made by fifty-one college students on a repetition of the test.

Friermood¹⁸ constructed a dribble for speed and control test. He arbitrarily assigned a penalty of one second for each error. The error trial was counted as a trial, but another trial was given. The penalty for error was added to the time recorded for the extra trial. This score was then used as the score for the original trial.

The dribble for speed and control test was not scientifically examined for reliability.

The test-retest method and split-halves method were two methods used for determining the reliability of a test. According to Feldt and Mckee,¹⁹ the test-retest method was preferred, since it defined both error components. These error components were the trial-to-trial variation and the day-to-day variation. The test-retest reliability was computed using the average of four trials in one session to correlate with the average of four trials of a second session two weeks later. The split-halves reliability was obtained by correlating the average of the first two trials with the average of the second two trials in the first session.

Baumgartner²⁰ agreed with Feldt and Mckee. He stated that using the Spearman-Brown Prophecy formula on the split-halves method caused a bias when determining the test length needed to secure a given level of reliability. He also stated that the test-retest method was a truer score for reliability.

In a study completed by McCraw and Tolbert,²¹ it was shown that different ways of scoring tests produced different reliabilities. Their study found that the highest coefficients of correlation were obtained for the average of three trials. Just slightly lower reliabilities were

found for the best of three trials and the median of three trials. The correlation for one trial was the lowest of all.

Footnotes--Chapter II

¹A. R. Leilich, "The Primary Components of Selected Basketball Tests for College Women" (unpublished Ph.D. dissertation, Indiana University, 1952), pp. 1-53.

²W. D. Miller, "Achievement Levels in Basketball Skills for Women Physical Education Majors," Research Quarterly, XXV (December, 1954), 450-5.

³Young, op. cit., p. 2.

⁴Dyer, op. cit., pp. 128-47.

⁵J. M. Johnson, "The Relationship Between Skill as Measured by a Combination of Selected Basketball Tests and Judges Ratings of Basketball Playing Ability," Completed Research in Health, Physical Education and Recreation, I (1959), 29.

⁶D. Brace, Chairman. A.A.H.P.E.R. Basketball Skills Test Manual for Girls (Washington, D.C.: NEA Publication-Sales, 1966), pp. 1-35.

⁷M. G. Scott and E. French, Measurement and Evaluation in Physical Education (Dubuque, Iowa: Wm. C. Brown Company, 1959), p. 159.

⁸Ibid., p. 163.

⁹J. Dyer, J. C. Schunig, and S. L. Apgar, "A Basketball Motor Ability Test for College Women and Secondary School Girls," Research Quarterly, X (October, 1939), 128-47.

¹⁰G. Young and H. Moser, "A Short Battery of Tests to Measure Playing Ability in Women's Basketball," Research Quarterly, V (May, 1934), 2.

¹¹M. Latchaw, "Measuring Selected Motor Skills in Fourth, Fifth, and Sixth Graders," Research Quarterly, XXV (December, 1954), 439-49.

¹²S. J. Kammeyer, "Reliability and Validity of a Motor Ability Test for High School Girls," Research Quarterly, XXVII (October, 1956), 310-5.

¹³T. Anderson and C. H. McCloy, "The Measurement of Sports Ability in High School Girls," Research Quarterly, XVIII (March, 1947), 2-11.

¹⁴P. Cunningham, "Measuring Basketball Playing Ability of High School Girls," Dissertation Abstracts, XXV (1965), 5095.

¹⁵Scott, op. cit., pp. 159-63; see also C. E. Willgoose, Evaluation in Health Education and Physical Education (New York: McGraw-Hill Book Co., 1961), pp. 224-6; see also H. D. Edgren, "An Experiment in the Testing of Ability and Progress in Basketball," Research Quarterly, III (March, 1932), 159-71; see also N. Lehsten, "A Measure of Basketball Skills in High School Boys," The Physical Educator, V (1948), 103-9; see also F. Stroup, "Relationship Between Measurements of Field of Motion Perception and Basketball Ability in College Men," Research Quarterly, XXVIII (March, 1957), 72-5.

¹⁶R. B. Glassow, V. Colvin, and M. M. Schwarz, "Studies in Measuring Basketball Playing Ability of College Women," Research Quarterly, IV (December, 1938), 60-8.

¹⁷R. B. Glassow and M. R. Broer, Measuring Achievement in Physical Education (Philadelphia, Penn.: W. B. Saunders Co., 1938).

¹⁸H. T. Friermood, "Basketball Progress Tests Adaptable to Class Use," Journal of Health, Physical Education, and Recreation, V (January, 1934), 45-7.

¹⁹L. S. Feldt and M. E. Mckee, "Estimation of the Reliability of Skills Tests," Research Quarterly, XXIX (October, 1958), 279-93.

²⁰T. A. Baumgartner, "The Applicability of the Spearman-Brown Prophecy Formula When Applied to Physical Performance Tests," Research Quarterly, XXXIX (December, 1968), 847-52.

²¹L. W. McCraw and J. W. Tolbert, "A Comparison of the Reliabilities of Methods of Scoring Tests of Physical Ability," Research Quarterly, XXIII (March, 1952), 73-81.

CHAPTER III

METHODS OF RESEARCH

This study was undertaken to determine the reliability, validity, and relative importance of performance on a ball control test in relationship to the basketball ability of college women.

Ball Control Test

Design and Method

Subjects.--The subjects for the study were an available sample of thirty-one, right-handed women students at Michigan State University whose ages ranged from 17 to 22 years. The mean age was 19.0.

The subjects were enrolled in a beginning basketball class during the winter term in 1970. The mean number of seasons of experience was 1.0 seasons ranging from 0 to 4 seasons of experience.

Method.--The subjects were given the ball control test and a subjective basketball ability rating in four successive class periods. There were two class periods per week. The investigation was conducted the last two weeks of a nine week unit.

A series of test-retest reliabilities of the ball control test were first computed to determine the most reliable measure of scoring. The best of four trials with a one-second penalty added for each error indicated the highest reliability. This scoring method was used throughout the remaining analyses.

To assess validity, the ball control test results were correlated with the sum of the judges' ratings.

Testing Procedure

Testing schedule.--Data were collected during four successive class periods.

Period 1: reported on page 23.

During period 2, all subjects practiced the ball control test and were rated by the judges during a basketball game.

During period 3, four trials of the ball control test were administered to all subjects. The judges rated all subjects during their second basketball game.

During period 4, four trials of the ball control test were again administered to all subjects. The judges rated all subjects during their last basketball game and arrived at the final rating of each subject.

Ball control test.--A time score was recorded during a testing period. The numbers and types of errors were recorded by the scorer for each of four trials on an individual score card (Appendix A).

The time allotment for administering the ball control test was approximately one minute and fifteen seconds for each girl. The time was six minutes for a team of five girls rotating through the test one after the other. This allowed a controlled rest interval between each subject's trials.

Basketball ability rating.--Each player was subjectively rated in basketball ability by five judges. The judges were selected on the basis of the following criteria: a judge must be a physical educator; each judge must have had previous experience in teaching basketball.

The rating form was given to each judge during the week before the rating periods. The rating scale was discussed with each judge prior to the rating periods.

The rating scale, reproduced in Appendix B, had a scale of values ranging from one to five. The scale was devised in order to measure separately the specific skills of passing, catching, rebounding, dribbling, and body control in a game situation.

During a rating period, each judge rated each subject on each of the five skills. The rating was recorded by a recorder on an individual rating card for each subject (Appendix C). Each subject wore an identifying number and color which was the same during all testing and rating periods.

There was a total of three rating periods. Individual rating periods consisted of each team playing in a basketball game of approximately fifteen to twenty minutes running time. Subjects were added to complete the teams when it was necessary. These added subjects were not rated during this additional playing time.

Description of the Tests

Ball control test.--The ball control test consisted of dribbling through the floor pattern while carefully placing each step inside the correct rectangle. The ball was passed against the wall, the subject dodged two obstacles and proceeded around a third obstacle, and then used a fast break to the finish. The floor pattern used was obtained from an article appearing in the 1962-1963 Division of Girls' and Women's Sports Basketball Guide¹ and is shown in Figure 1.

The timer stood to the side of each subject and read the test directions (Appendix D). On the signal "Ready-go," the timer started the watch and checked for errors throughout the test trial. Errors included illegal dribbling, traveling, stepping on a line, throwing the ball below the line on the wall, losing control of the ball, and missing a rectangle. The trial was timed to the nearest tenth of a second. Four trials were given to each subject.

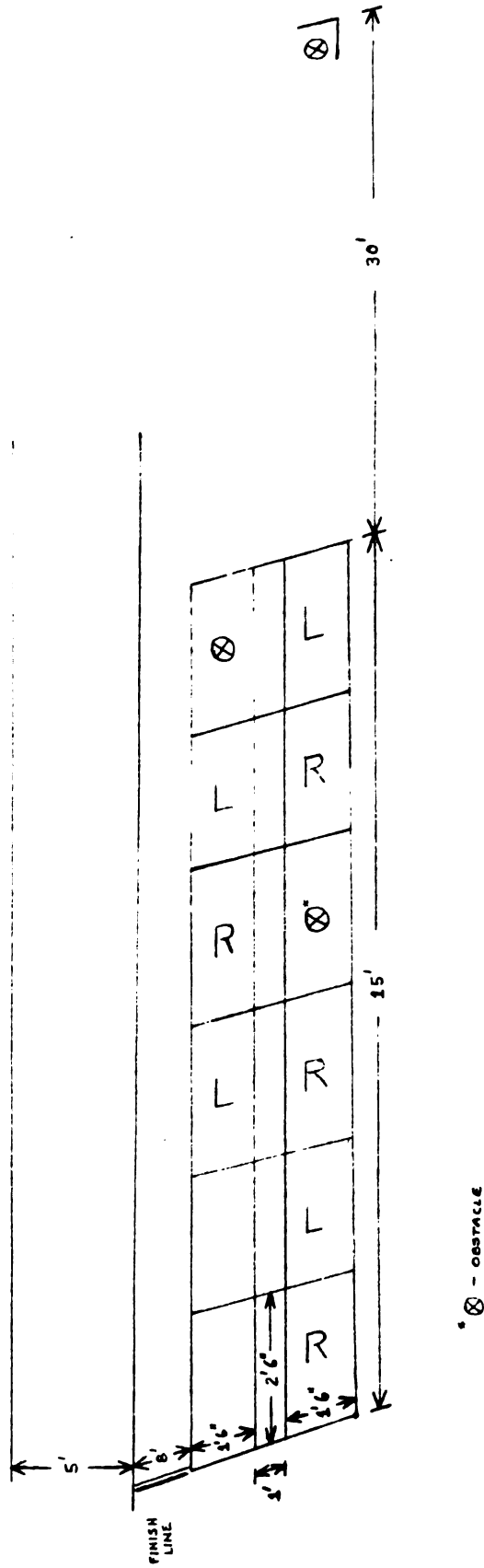


Figure 1.--Floor Pattern Markings for the Ball Control Test.

Stability of Measurements

The reliability coefficients of the ball control test and the reliability coefficients of the judges' ratings are reported in Table 1, page 20. The test-retest reliability of the ball control test was calculated by the Pearson Product Moment correlation. The relationship between judges was determined by the Spearman Rank Order coefficient of correlation of the different pairs of judges.

Treatment of the Data

The data for the analysis were analyzed with the assistance of a 3600 computer at Michigan State University. Three statistical routines from the Agricultural Experiment Station STAT Series and one routine from the CISSR Series were used. BASTAT was used for analyzing the most reliable scoring method of the ball control test. The CISSR routine for rank correlation coefficients was used for analyzing the validity of the ball control test.

Reliability of the ball control test.--The test-retest Pearson Product Moment correlation was computed for each of thirteen different scoring methods: scoring methods with no penalty for one error or less

1. Best of two trials
2. Best of three trials
3. Best of four trials
4. Average of two trials

and scoring methods with one second penalty added for each error

TABLE 1.--Reliabilities, Means, and Standard Deviations of Skill Tests and Judges' Ratings.

Source	Reliability	Mean	Standard Deviation
(Pearson Correlations)			
Ball control test (best of four trials)	.77*	12.61	1.39
Half minute shooting test	.82 ^a *	8.81	2.55
Modified Edgren's wall pass test	.82 ^a *	8.61	1.23
(Spearman Correlations)			
Judges' ratings			
Judge 1		13.23	3.72
Judge 1 with judge 2	.64*		
Judge 1 with judge 3	.66*		
Judge 1 with judge 4	.70*		
Judge 1 with judge 5	.57*		
Judge 2		13.97	3.06
Judge 2 with judge 3	.73*		
Judge 2 with judge 4	.36*		
Judge 2 with judge 5	.56*		
Judge 3		15.35	3.84
Judge 3 with judge 4	.58*		
Judge 3 with judge 5	.45*		
Judge 4		15.03	3.79
Judge 4 with judge 5	.12		
Judge 5		14.26	2.97

* p = .05

^aCalculated by: M. G. Scott and E. French, Measurement and Evaluation in Physical Education (Dubuque, Iowa: Wm. C. Brown Company, 1959), pp. 159 and 163.

5. Best of two trials
6. Best of three trials
7. Best of four trials
8. Average of two trials
9. Average of three trials
10. Average of four trials
11. Sum of two trials
12. Sum of three trials
13. Sum of four trials

Table 2 presents the test-retest reliability coefficients for all thirteen trial combinations of scoring the ball control test. The scoring methods using the best trials resulted in the highest reliability coefficients. The method resulting in the highest correlation ($r = .77$) was the best of four trials with a one-second penalty added for each error. This method of scoring the ball control test was used for the remaining analyses.

Validity of the ball control test.--The validity of the ball control test was made by comparing the sum of the judges ratings of the subject with her score on the ball control test. A Spearman Rank Order coefficient of correlation was used for the validity.

Battery of Basketball Skill Tests

Design and Method

The subjects were given the modified Edgren wall pass test and nine A.A.H.P.E.R. Basketball skill tests which included: the front shot test, the side shot test, the foul shot test, the underbasket shot test, the overarm pass test, the push pass test, the dribble test, the speed pass test, and the jump and reach test.

TABLE 2.--Ball Control Test Reliabilities, Means, and Standard Deviations.

Scoring	Error Free Trials (1 error = no error)				Penalty for Error Trials (1 second penalty per error)			
	Day 1		Day 2		Day 1		Day 2	
	r	$\bar{X}$	S.D.	$\bar{X}$	S.D.	r	$\bar{X}$	S.D.
Best of 2	.61*	12.98	1.25	12.27	1.20	.58*	13.14	1.35
							12.48	1.25
Best of 3	.76*	12.48	1.29	11.89	1.11	.70*	12.73	1.33
							12.11	1.22
Best of 4	.75*	12.36	1.20	11.68	1.12	.77*	12.61	1.39
							11.82	1.22
Avg. of 3						.48*	13.56	1.52
							12.95	1.48
Avg. of 4						.62*	13.50	1.45
							12.73	1.44
Sum of 2						.48*	27.68	3.20
							25.95	2.75
Sum of 3						.56*	40.70	4.54
							38.59	4.00
Sum of 4						.63*	53.98	5.81
							51.31	5.48

* p = .05.

The ten tests listed above and the ball control test given the first testing day were used as a set of independent variables in a least squares problem with the dependent variable being the sum of the judges' ratings. A least squares equation was calculated each time one of the independent variables was deleted. A set of least squares equations was also calculated when the ball control test was retained in the equation.

Testing Procedure

Testing schedule.--During period 1, the modified Edgren wall pass test and the A.A.H.P.E.R. battery of basketball skill tests were administered to all subjects. During any of the remaining three periods, these skill tests were given to those subjects who did not complete the battery during the first period.

Battery of skill tests.--The A.A.H.P.E.R. basketball skill tests² and the modified Edgren wall pass test³ were administered according to their instructions.

Treatment of Data

LSDEL and LS routines from the Agricultural Experiment Station STAT Series were used for analyzing the validity of a battery of skill tests. These routines also calculated a least squares equation each time one of the skill tests was deleted from the battery. The routine was

run twice; the second time the ball control test was retained in the least squares equation.

Validity of tests.--Validity was obtained for each of the A.A.H.P.E.R. battery and for the modified Edgren wall pass test by correlating the sum of the judges' ratings of the subject with her score on each of the tests.

Validity of the batteries.--The battery validities were determined by a least squares analysis. The skill test which had the least significant beta weight was the next test to be deleted from the battery. After each deletion, multiple correlations, regression coefficients and their significance, beta weights, coefficients of determination, and partial correlation coefficients were computed for the remaining tests in the battery. These statistics were also computed when the ball control test was retained in the battery.

Footnotes--Chapter III

¹R. Benton, R. Woosley, and B. Saunders, "Footwork Floor Pattern," Basketball Guide--D.G.W.S. (1962-1963), 51-4.

²D. Brace, Chairman. A.A.H.P.E.R. Basketball Skills Test Manual for Girls (Washington, D.C.: NEA Publication-Sales, 1966), pp. 1-35.

³M. G. Scott and E. French, Measurement and Evaluation in Physical Education (Dubuque, Iowa: Wm. C. Brown Company, 1959), pp. 162-3.

⁴Brace, op. cit., pp. 1-35.

⁵H. D. Edgren, "An Experiment in the Testing of Ability and Progress in Basketball," Research Quarterly, III (March, 1932), 159-71.

⁶Brace, op. cit., p. 11.

⁷Scott, op. cit., p. 163.

CHAPTER IV

RESULTS AND DISCUSSION

This study was undertaken to determine the reliability, validity, and relative importance of performance on a ball control test in relationship to the basketball ability of college women.

Validity of Skill Tests

Ball Control Test

The validity of the ball control test was calculated by a simple correlation between the ball control test and the sum of the judges' ratings (Table 3). The validity was $r = -.43$ which was significant at the .05 level.

Other Skill Tests

The validity of each of the other ten skill tests was calculated by a simple correlation between each test and the sum of the judges' ratings (Table 3). The test with the highest validity was the underbasket shot test. The validity was $r = +.58$ which was significant at the .05 level. The other skill tests with significant validities were as follows: the side shot test, the foul shot

TABLE 3.--Intercorrelations of Basketball Skill Tests and Basketball Ability Ratings.

Test	Push Pass Test	Side Shot Test	Foul Shot Test	Overarm Pass Test	Modified Edgren Wall Pass Test	Jump and Reach Test	Speed Pass Test	Front Shot Test	Dribble Test	Underbasket Shot Test	Ball Control Test (1st Day)	Ball Control Test (2nd Day)	Sum of Judges' Ratings
Push Pass Test	1.0000												
Side Shot Test	.2546	1.0000											
Foul Shot Test	.1100	.4560*	1.0000										
Overarm Pass Test	.7162*	.2463	.2547	1.0000									
Modified Edgren Wall Pass Test	.3773*	.3738*	.3367*	.3974*	1.0000								
Jump and Reach Test	.1163	.0138	.1833	.1158	.1151	1.0000							
Speed Pass Test	-.1564	-.1615	-.4926*	-.1368	-.4826*	-.6313*	1.0000						
Front Shot Test	.1997	.6343*	.4048*	.1531	.4448*	.0212	-.3449*	1.0000					
Dribble Test	-.2039	-.1902	-.5545*	-.2995*	-.5790*	-.3288*	.5979*	-.1328	1.0000				
Underbasket Shot Test	.4651*	.4361*	.4774*	.4291*	.4221*	.1312	-.3042*	.3295*	-.3091*	1.0000			
Ball Control Test (1st Day)	-.2677	-.3771*	-.3504*	-.2693	-.4024*	.0033	.3108*	-.0302	.5871*	-.3979*	1.0000		
Ball Control Test (2nd Day)	-.4158*	-.2845	-.4743*	-.4668*	-.3601*	-.3835*	.5338*	-.0651	.6765*	-.3351*	.7731*	1.0000	
Sum of Judges' Ratings	.2023	.3797*	.5671*	.2514	.4885*	.1610	-.5774*	.3936*	-.5402*	.5803*	-.4312*	-.4952*	1.0000

* p = .05.

test, the modified Edgren wall pass test, the speed pass test, the front shot test, and the dribble test.

Intercorrelation of Skill Tests

Ball Control Test

Simple correlations between the ball control test and each of the other ten skill tests were computed (Table 3). With the dribble test, the ball control test had its highest intercorrelation which was $+0.59$. The ball control test had its second highest intercorrelation with both the modified Edgren wall pass test and the underbasket shot test. Both correlations were $r = -0.40$.

Other Skill Tests

Simple correlations between pairs of the other ten skill tests were computed (Table 3). The speed pass test was the only passing test which had no significant correlation with other passing tests. All shooting tests had significant intercorrelations with the other shooting tests. Skill tests involving speed and ball handling correlated significantly with each other. The foul shot test correlated significantly with the tests involving speed and ball handling. The jump and reach test correlated significantly with only two tests involving speed and ball handling. With beginning basketball players, this indicated that these two tests which required minimum

ball handling showed results similar to the tests involving speed and ball handling.

Batteries of Skill Tests

The AES STAT Series Least Squares Delete routine was used to calculate the battery statistics. The largest battery included the ten skill tests and the ball control test. All statistics were calculated for the eleven-test battery. The skill tests with the least significant beta weight was removed from the battery. All statistics were calculated for the new ten-test battery. The single-test deletion continued until there was only one test remaining in the battery. All statistics were calculated for each new battery.

Table 4

The ball control test was the fourth test to be deleted from the batteries. It was deleted from the eight-test battery to form a seven-test battery. Very little change in the battery validities was shown between the eight-test battery, Battery D, and the seven-test battery, Battery E. There were changes within the battery when deleting from Battery D to form Battery M. In Battery M, the coefficient of determination of both the under-basket shot test and the dribble test was larger. The beta weight of the dribble test was larger which made it significantly different from zero. The partial correlation

TABLE 4.--Eight-test Battery and Two Seven-test Batteries.

Batteries	Multiple Correlation Coefficient R	Ball Control Test	Underbasket Shot Test	Dribble Test	Front Shot Test	Speed Pass Test	Jump and Reach Test	Modified Edgren Wall Pass Test	Overarm Pass Test
D									
Eight-test	0.8195	(3.96%)	(21.41%)	(21.29%)	(9.73%)	(21.59%)	(-3.43%)	(-5.58%)	(-1.82%)
with		(-0.10301)	(0.45586)*	(-0.35699)*	(0.29171)	(-0.33321)*	(-0.20527)	(-0.13182)	(-0.12087)
Ball control	(67.15%)	-0.08177	0.36731	-0.35059	0.21840	-0.35775	-0.17534	-0.11274	-0.08259
		[0.2359]	[5.7711]*	[3.2133]	[2.0463]	[2.7478]	[0.9677]	[0.3890]	[0.3262]
Seven-test	0.8165	(3.75%)	(19.91%)	(20.68%)	(9.71%)	(23.21%)	(-3.77%)	(-6.83%)	
with		(-0.09701)	(0.44347)*	(-0.34697)*	(0.28928)	(-0.36060)*	(-0.22564)	(-0.16433)	
Ball control	(66.67%)	-0.07745	0.34152	-0.34048	0.21801	-0.38471	-0.19232	-0.13797	
		[0.2185]	[5.6308]*	[3.1479]	[2.1005]	[3.4379]	[1.2338]	[0.6383]	
Seven-test	0.8173	(22.69%)	(22.69%)	(23.80%)	(9.01%)	(22.51%)	(-3.95%)	(-5.52%)	(-1.74%)
without		(0.49214)*	(0.49214)*	(-0.42649)*	(0.27666)	(-0.34745)*	(-0.24468)	(-0.12966)	(-0.11583)
Ball control	(66.80%)	0.38931	0.38931	-0.39180	0.20237	-0.37306	-0.20180	-0.11145	-0.07943
		[7.3511]*	[7.3511]*	[5.1136]*	[1.9063]	[3.1579]	[1.4647]	[0.3933]	[0.3128]

*p = .05.
 (% contribution)
 (partial correlation)
 beta weight
 [F-statistic of beta]

coefficients were larger for both the underbasket shot test and the dribble test which made them both significant. When these changes occurred within the battery, it indicated that more of the variance was accounted for in the sum of the judges' ratings when the ball control test was not included in the battery.

For comparison, the ball control test was retained in the seven-test battery and the next skill test with the least significant beta weight, the overarm pass test, was forced from the battery thus forming Battery E. The ball control test was not significant in either Battery D or Battery E.

Very little change was noted within each skill test when comparing batteries in Table 4.

Table 5

For the battery statistics that follow, the ball control test was forced to remain in each battery while other skill tests with less significance were deleted. In Table 5, the multiple correlations of the batteries ranged from $R = .48$ to $R = .82$ and were significant at the .05 level. The standard error of estimate for the eleven-test through the three-test batteries ranged from 10.0311 to 9.1769 which was less than one. Whereas, between the three-test battery and the two-test battery, the standard error of estimate increased more than one.

TABLE 5.--Multiple Correlations, Standard Errors of Estimate, and Coefficients of Determination for Batteries Containing the Ball Control Test.

Battery Symbol	Batteries	Multiple Correlation Coefficient R	F-Statistic	Standard Error of Estimate	Coefficient of Determination R ²
A	Ball Control Test, Underbasket Shot Test, Dribble Test, Front Shot Test, Speed Pass Test, Jump and Reach Test, Edgren Wall Pass Test, Overarm Pass Test, Foul Shot Test, Side Shot Test, Push Pass Test	0.8222	3.6033*	10.0311	0.6760
B	Ball Control Test, Underbasket Shot Test, Dribble Test, Front Shot Test, Speed Pass Test, Jump and Reach Test, Edgren Wall Pass Test, Overarm Pass Test, Foul Shot Test, Side Shot Test	0.8219	4.1647*	9.7831	0.6756
C	Ball Control Test, Underbasket Shot Test, Dribble Test, Front Shot Test, Speed Pass Test, Jump and Reach Test, Edgren Wall Pass Test, Overarm Pass Test, Foul Shot Test	0.8212	4.8307*	9.5661	0.6743
D	Ball Control Test, Underbasket Shot Test, Dribble Test, Front Shot Test, Speed Pass Test, Jump and Reach Test, Edgren Wall Pass Test, Overarm Pass Test	0.8195	5.6226*	9.3855	0.6715
E	Ball Control Test, Underbasket Shot Test, Dribble Test, Front Shot Test, Speed Pass Test, Jump and Reach Test, Edgren Wall Pass Test	0.8165	6.5718*	9.2470	0.6667
F	Ball Control Test, Underbasket Shot Test, Dribble Test, Front Shot Test, Speed Pass Test, Jump and Reach Test	0.8108	7.6764*	9.1771	0.6574
G	Ball Control Test, Underbasket Shot Test, Dribble Test, Front Shot Test, Speed Pass Test	0.8020	9.0122*	9.1769	0.6432
H	Ball Control Test, Underbasket Shot Test, Dribble Test, Front Shot Test	0.7827	10.2805*	9.3756	0.6126
J	Ball Control Test, Underbasket Shot Test, Dribble Test	0.7372	10.7118*	9.9887	0.5434
K	Ball Control Test, Underbasket Shot Test	0.6447	9.9560*	11.0971	0.4156
L	Ball Control Test	0.4845	8.8947*	12.4780	0.2347

* p = .05.

The lowest standard error of estimate was calculated for the five-test battery.

The coefficient of determination for the batteries had a range from the lowest .23 to the highest .68. These values represented the proportion of the variability in the sum of the judges' ratings which was accounted for by the battery of skill tests. The battery with a coefficient of determination of .50 or more and including the smallest number of skill tests was the three-test battery. This battery accounted for 54.34% of the variance within the sum of the judges' ratings. The battery with a coefficient of determination of .50 or more with the highest coefficient of determination for the ball control test was the five-test battery. The percentage of variance within the sum of the judges' ratings accounted for by each skill test in the battery was determined by the product of the beta weight of the skill test and its simple correlation with the sum of the judges' ratings. The ball control test in the five-test battery accounted for 6.07% of the total variance with the sum of the judges' ratings. This indicated that the ball control test when combined with other skill tests in a battery contributed very little to the total variance in the sum of the judges' ratings.

Table 6

The partial correlations were calculated to observe the relationship between the variance not accounted for in

TABLE 6.--Coefficients of Determination, Partial Correlation Coefficients, and Beta Weights for Each Skill Test in the Batteries Containing the Ball Control Test.

Battery Symbol	Battery	Multiple Correlation Coefficient	Ball Control Test	Underbasket Shot Test	Dribble Test	Front Shot Test	Speed Pass Test	Jump and Reach Test	Edgren Wall Pass Test	Overarm Pass Test	Foul Shot Test	Side Shot Test	Push Pass Test
A	Eleven-Test	0.8222 (67.60%)	(5.68%) (-0.12710) [0.3120]	(20.59%) (0.41220)* [3.8892]	(17.91%) (-0.27342) [1.5352]	(10.54%) (0.23763) 1.1371	(18.81%) (-0.26788) [1.4689]	(-2.81%) (-0.15871) [0.4910]	(-3.92%) (-0.08807) [0.1485]	(-1.49%) (-0.07696) [0.1132]	(5.23%) (0.09455) [0.1174]	(-2.26%) (-0.06216) [0.0737]	(-0.68%) (-0.03500) [0.0233]
B	Ten-Test	0.8219 (67.56%)	(-0.12464) (-0.11464) [0.3156]	(0.41658)* (-0.34624) [4.1996]	(-0.27447) (-0.29604) [1.6294]	(0.23556) (0.23382) [1.1750]	(-0.26662) (-0.31002) [1.5305]	(-0.15983) (-0.14428) [0.5243]	(-0.08905) (-0.07998) [0.1599]	(-0.12851) (-0.08756) [0.3359]	(5.70%) (0.10623) [0.2283]	(-2.27%) (-0.06253) [0.0785]	
C	Nine-Test	0.8212 (67.41%)	(4.15%) (-0.10805) [0.2481]	(20.08%) (0.41432)* [4.3521]	(18.82%) (-0.29183) [1.9564]	(8.73%) (0.35166) [1.4199]	(20.38%) (-0.31133)* [2.2540]	(-3.18%) (-0.16844) [0.7774]	(-4.32%) (-0.09763) [0.2021]	(-1.90%) (-0.12699) [0.3442]	(4.57%) (0.09146) [0.1772]		
D	Eight-Test	0.8195 (67.15%)	(3.96%) (-0.10301) [0.2358]	(21.41%) (0.45586)* [5.7711]	(21.29%) (-0.35699)* [3.2433]	(9.73%) (0.29171) [2.0463]	(21.59%) (-0.33321)* [2.7478]	(-3.43%) (-0.20527) [0.9677]	(-5.58%) (-0.13182) [0.3890]	(-1.82%) (-0.12087) [0.3262]			
E	Seven-Test	0.8165 (66.67%)	(-0.09701) (-0.07745) [0.2185]	(0.44347)* (-0.34152) [5.6308]	(-0.34697)* (-0.34048) [3.1479]	(0.28928) (0.21801) [2.1005]	(-0.36060)* (-0.38471) [3.43797]	(-0.22564) (-0.19232) [1.2338]	(-0.16433) (-0.13797) [0.6383]				
F	Six-Test	0.8108 (65.74%)	(3.58%) (-0.09143) [0.2023]	(18.66%) (0.42206)* [5.2018]	(17.12%) (-0.31076)* [2.5655]	(8.01%) (0.25103) [1.6141]	(21.69%) (-0.33915)* [3.1193]	(-3.32%) (-0.19990) [0.16937]					
G	Five-test	0.8020 (64.32%)	(6.07%) (-0.15844) [0.6438]	(17.75%) (0.40026)* [4.7692]	(16.46%) (-0.29475) [2.3985]	(10.01%) (0.31811)* [2.8187]	(14.01%) (-0.28022) [2.1386]						
H	Four-Test	0.7827 (61.26%)	(5.32%) (-0.13418) [0.4767]	(18.69%) (0.40880)* [5.0953]	(24.67%) (-0.4628)* [7.0888]	(12.58%) (0.38238)* [4.6465]							
J	Three-Test	0.7372 (54.34%)	(2.68%) (-0.06136) [0.1088]	(24.70%) (0.49676)* [8.8456]	(26.96%) (-0.46768)* [7.5589]								
K	Two-Test	0.6447 (41.56%)	(14.54%) (-0.33877)* [3.6300]	(27.02%) (0.48616)* [8.6661]									
L	One-Test	0.4845 (23.47%)	(23.47%) (-0.48448)* [8.9947]										

* $p = .05$
 (t contribution)
 (partial correlation)
 beta weight
 [F-statistic of beta]

each of the skill tests and the variance not accounted for in the sum of the judges' ratings. In Table 6, the partial correlation coefficients were significant for the under-basket shot test in all of the eleven batteries. The dribble test had significant partial correlation coefficients for the eight-test through the one-test batteries with the exception of the five-test battery. The speed pass test had a significant partial correlation coefficient for the nine-test through the six-test battery. The front shot test had significant partial coefficients for the five-test and the four-test batteries. The ball control test had a significant partial correlation coefficient for the two-test battery and when it was by itself in the one-test battery.

The beta weights were normalized weightings of the skill tests. In Table 6, there were only three tests which had significant beta weights when combined with other skill tests. The three skill tests were the under-basket shot test, the dribble test, and the front shot test.

For a more detailed analysis of the ball control test, two batteries were selected. The five-test battery was chosen for several reasons. The standard error of estimate of the multiple correlation was the lowest. The multiple correlation of the battery was above .80 which was significant. The contribution of the five-test battery

to the total variance of the sum of the judges' ratings was 64.32%. In the battery, the ball control test had its highest contribution to the total variance of the sum of the judges' ratings. The contribution of each skill test to the total variance of the sum of the judges' ratings was determined by the product of its beta weight and its simple correlation with the sum of the judges' ratings.

The three-test battery was chosen for a more detailed analysis for the following reasons. The contribution of the battery to the total variance of the sum of the judges' ratings was more than 50%. The multiple correlation was above .70 which was significant. The standard error of estimate of the multiple correlation was the last one calculated before the rate of increase changed. In the three-test battery excepting the ball control test, all of the partial correlation coefficients and beta weights were significant. This battery would significantly measure basketball ability if the ball control test were eliminated.

Table 7

Battery G was compared to Battery O. In Battery O, the partial correlation coefficients and the beta weights for the dribble test were larger and significant. The partial correlation coefficient of the front shot test

TABLE 7.--Two Five-test Batteries and a Four-test Battery.

Batteries	Multiple Correlation Coefficient R	Ball Control Test	Underbasket Shot Test	Dribble Test	Front Shot Test	Speed Pass Test	Jump and Reach Test
Five-test	0.8020	(6.07%)	(17.75%)	(16.46%)	(10.03%)	(14.01%)	
G with	(64.32%)	(-0.15844)	(0.40026)*	(-0.29475)	(0.31831)*	(-0.28072)	
	S.E.9.1769	-0.12527	0.30456	-0.27093	0.22514	-0.23221	
Ball control	[9.0122]*	[0.6438]	[4.7692]*	[2.3785]	[2.8187]	[2.1386]	
Five-test	0.8090		(19.89%)	(19.47%)	(7.39%)	(22.44%)	(-3.79%)
O without	(65.45%)		(0.46458)*	(-0.39028)*	(0.23718)	(-0.35220)*	(-0.23701)
	S.E.9.0295		0.34120	-0.32052	0.16589	-0.37275	-0.19319
Ball control	[9.4735]*		[6.8808]*	[4.4923]*	[1.4902]	[3.5403]	[1.4878]
Four-test	0.7962		(19.83%)	(20.68%)	(9.39%)	(13.50%)	
P without	(63.40%)		(0.45307)*	(-0.40278)*	(0.29899)	(-0.26850)	
	S.E.9.1138		0.34021	-0.34049	0.21090	-0.22362	
Ball control	[11.2586]*		[6.7155]*	[5.0348]*	[2.5525]	[2.0200]	

* p = .05.
 (% contribution)
 (partial correlation)
 beta weight
 [F-statistic of beta]

S.E. Standard Error of Estimate
 [F-statistic of S.E.]

lost its significance. The partial correlation coefficient for the speed pass test became significant. The partial correlation coefficients and the beta weights for the underbasket shot were larger. Excepting the front shot test, the contribution of each skill test to the total variance of the sum of the judges' ratings was larger. The contribution of each skill test to the total variance of the sum of the judges' ratings was determined by the product of its beta weight and its simple correlation with the sum of the judges' ratings. These changes indicated that the replacement of the ball control test by the jump and reach test in the five-test battery accounted for more of the variance in the sum of the judges' ratings.

In Table 7, Battery G was compared to Battery P. In Battery P, the contribution to the total variance of the sum of the judges' ratings, the partial correlation coefficients, and the beta weights were larger and significant for the underbasket shot test and the dribble test. The diminishing values of these statistics for the front shot test and speed pass test were evident. This indicated that with or without the ball control test, the other skill tests accounted for about the same total variance.

The three batteries in Table 7, Batteries G, O, and P, had similar multiple correlations with a range of $R = .80$ to $.81$. All three batteries had similar contributions to the total variance of the sum of the judges'

ratings. The contributions ranged from 63.4% to 65.5%. None of the three batteries had significant partial correlation coefficients or beta weights for all skill tests including the ball control test. This indicated that there were too many skill tests that were not contributing significantly to the batteries.

Table 8

Battery J was compared to Battery Q. In Battery Q, the partial correlation coefficients and the beta weights were significant for all of the skill tests. The partial correlation coefficient, the beta weight, and the contribution to the total variance of the sum of the judges' ratings were larger for the dribble test and were less for the underbasket shot test. The multiple correlation was larger and significant. The standard error of estimate was less. The contribution that Battery Q made to the total variance of the sum of the judges' ratings was larger. With the beta weights significant for all of the skill tests, Battery Q was a significant predictor of basketball ability.

In Table 8, Battery J was compared to Battery R. In Battery R, the multiple correlation was less, but significant. The standard error of estimate was less. The contribution to the total variance in the sum of the judges' ratings, the partial correlation coefficients,

TABLE 8.--Two Three-test Batteries and a Two-test Battery.

Batteries	Multiple Correlation Coefficient R	Ball Control Test	Underbasket Shot Test	Dribble Test	Front Shot Test
Three-test	0.7372 (54.34%)	(2.68%)	(24.70%)	(26.96%)	
J with	S.E.9.9887	(-0.06336)	(0.49676)*	(-0.46768)*	
Ball control	[10.7118]*	-0.05522	0.42376	-0.44395	
		[0.1088]	[8.8456]*	[7.5589]*	
Three-test	0.7782 (60.55%)		(20.49%)	(28.12%)	(11.94%)
Q without	S.E.9.2843		(0.45202)*	(-0.57392)*	(0.37354)*
Ball control	[13.8162]*		0.35151	-0.46310	0.26803
			[6.9334]*	[13.2614]*	[4.3782]*
Two-test	0.7359 (54.16%)		(25.47%)	(28.69%)	
R without	S.E.9.8285		(0.52311)*	(-0.55281)*	
Ball control	[16.5397]*		0.43698	-0.47229	
			[10.5488]*	[12.3227]*	

* p = .05.
 (% contribution)
 (partial correlation)
 beta weight
 [F-statistic of beta]

S.E. Standard Error of Estimate
 [F-statistic of S.E.]

and the beta weights for each skill test were larger and significant. This indicated that Battery R was a significant predictor of basketball ability, but did not account for as much variance in the sum of the judges' ratings as did Battery Q.

In Table 8, in Battery J and in Battery R, the multiple correlation and standard error of estimate were similar. The ball control test did not have a significant beta weight or partial correlation coefficient. The partial correlation coefficients and beta weights were significant for all of the other skill tests. In Battery Q, the multiple correlation was larger and the standard error of estimate was smaller than in Battery J or than in Battery R.

Discussion

As a single test of basketball ability, the ball control test had the sixth highest correlation of validity of the eleven basketball skill tests. The ball control test had a moderate relationship, correlation higher than .40, with the following skill tests: the dribble test, the modified Edgren wall pass test, and the underbasket shot test.

As a part of a battery of basketball skill tests, the ball control test was the fourth skill test of eleven to be deleted from the battery. The deletion was based on the significance of the beta weight of the skill tests. The least significant was deleted.

Between Battery G in Table 7 and Battery J in Table 8, Battery G had the highest contribution to the total variance in the sum of the judges' ratings. However, all skill tests in Battery G including the ball control test did not have significant partial correlation coefficients or beta weights. In Batteries G and O in Table 7, the multiple correlation, the standard error of estimate, the significance of the batteries, and the contribution the batteries made to the total variance of the sum of the judges' ratings remained about the same. These statistics remained about the same in Battery O and P in Table 7. Therefore, the Batteries in Table 7 accounted for about the same total variance, but none were significant predictors of basketball ability.

In Table 8 in Batteries J, Q, and R, all skill tests except for the ball control test had significant partial correlation coefficients and beta weights. In Battery J and in Battery R, the multiple correlation, the standard error of estimate, the significance of the batteries, and the contribution the batteries made to the total variance of the sum of the judges' ratings remained about the same. In Battery Q, the multiple correlation and the contribution to the total variance of the sum of the judges' ratings were greater, the standard error of estimate was less, and significance of the multiple correlation was the same. Of the three

batteries, this indicated that Battery Q was the best measure of basketball ability. It also indicated that the elements tested by the ball control test were inherent in the other basketball skill tests; the ball control test had no significant contribution in predicting basketball ability.

Either Battery Q or Battery R in Table 8 would be a sound test battery for the prediction of basketball ability. Battery Q is slightly better than Battery R.

Regression equations of Batteries Q and R were obtained from regression coefficients. These equations can be used for predicting basketball ability from the obtained raw scores of the basketball skill tests. The regression equations are:

Three-test battery

basketball ability = $96.65 + 1.93$ (underbasket shot
test score)

-3.85 (dribble test score + .95
(front shot test score)

Two-test battery

basketball ability = $107.35 + 2.40$ (underbasket shot
test score)

-3.93 (dribble test score)

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

The purpose of the study was to determine the reliability, validity, and relative importance of performance of a ball control test in relationship to basketball ability of college women.

Thirty-one available, right-handed subjects enrolled in a beginning women's basketball class at Michigan State University during the winter term of 1970 participated in the study. They ranged in age from 17 years to 22 years. The mean age was 19.0. Ranging from 0 to 4 seasons, the mean number of seasons of experience playing basketball was 1.0.

During the four testing and rating class periods, the subjects were given the ball control test, nine A.A.H.P.E.R. basketball skill tests, the modified Edgren wall pass test, and a subjective basketball ability rating during the four consecutive class periods. The nine A.A.H.P.E.R. basketball skill tests were: the front shot test, the side shot test, the foul shot test, the under-basket shot test, the overarm pass test, the push pass

test, the dribble test, the speed pass test, and the jump and reach test.

Each subject was given the ball control test once during each of two successive class periods. The A.A.H.P.E.R. battery of nine skill tests and the modified Edgren wall pass test was administered once to each subject. Each class period for three consecutive periods, the five judges rated each subject during a twenty minute basketball game. The subjects were rated on each of five skills: passing, catching, rebounding, dribbling, and body control.

The ball control test had a reliability of .77 with significance at the .05 level using a Pearson Product Moment correlation. The best of four trials with a one second penalty added for errors was the scoring method used for the test-retest correlation.

The validity of the ball control test given the first testing period when correlated with the sum of the judges' ratings was $-.43$. This Spearman Rho Rank Order correlation was significant at the .05 level.

The ball control test and ten other skill tests were analyzed in a least squares regression routine to find the best battery of basketball skill tests and a prediction equation for basketball ability. The ball control test was the fourth test deleted from the group. At the time of deletion, it contributed 3.96% to the accounted for 67.15% variability in the sum of the judges'

ratings. When the ball control test was held into the battery of skill tests, the beta weight of the ball control test was not significantly different than zero at the .05 level of confidence. The ball control test did not contribute significantly to the batteries of skill tests of basketball ability.

Conclusions

The following conclusions were drawn from the data within the limitations of this study:

1. The ball control test was a reliable (.77) basketball skill test using as the scoring method the best of four trials with a one-second penalty added for each error.
2. The ball control test was a significantly valid (-.43) measure of basketball ability of college women. The test could be used as a means of classifying students, for selecting team members, or for identifying a players' weaknesses.
3. The ball control test, when combined with ten other basketball skill tests, did not explain significantly any of the accounted for variability in the sum of the judges' ratings of basketball ability.
4. A battery of skill tests with the ball control test included was not a significant predictor of basketball ability of college women.

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APPENDICES

APPENDIX A

INDIVIDUAL SCORE CARD

Front View

X1 ____ X2 ____
 X3 ____ X4 ____ X5 ____ X6 ____ X7 ____ X8 ____ X9 ____ X10 ____ X11 ____ X12 ____
 X13 ____ X14 ____ X15 ____ X16 ____ X17 ____

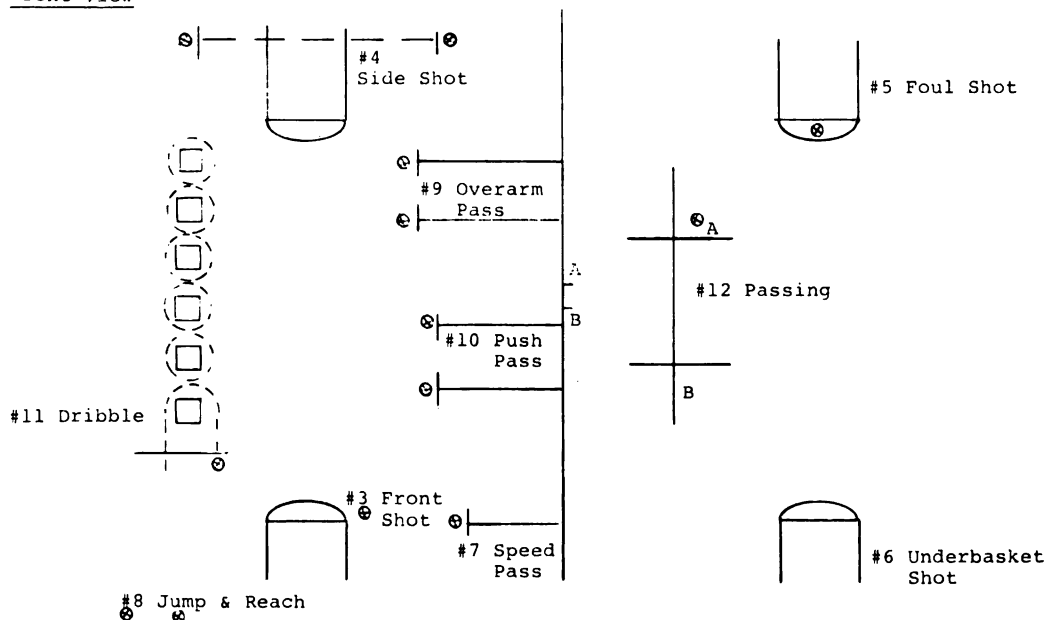
DO NOT WRITE ABOVE THIS LINE

OBS1 ____ NO. ____ NAME _____ SEASONS OF BASKETBALL PRIOR ____
 HOME TOWN & STATE _____ AGE ____ WHY DID YOU TAKE BASKETBALL THIS TERM? ____
 FFP2 ____ // Needed credits
 ____ // Like it
 ____ Was given it
 ____ Nothing else
 ____ fit schedule
 TEST 3 ____ //
 TEST 4 ____ //
 TEST 5 ____ //
 TEST 6 ____ //
 TEST 7 ____ //
 TEST 8 ____ //
 TEST 9 ____ //
 TEST 10 ____ //
 TEST 11 ____ //
 TEST 12 ____ //

1st Wk DATE _____

2nd Wk DATE _____

Front View



Back View

APPENDIX B

JUDGES' RATING SCALE

DESCRIPTION	PASSING	CATCHING	DRIBBLING	REBOUNDING	BODY CONTROL
5. Uses good form & (); & shows the feeling of assurance and of enjoyment.	(is accurate in passing the ball)	(is accurate in catching the ball)	(is accurate in dribbling the ball)	(has good timing & judgment in rebounding the ball)	(knows & uses good body control to evade or hinder opponent)
4. Uses good form & (); but lacks something in ease or naturalness.	(is accurate in passing the ball)	(is accurate in catching the ball)	(is accurate in dribbling the ball)	(has good timing & judgment in rebounding the ball)	(knows & uses good body control to evade or hinder opponent)
3. Uses good form with only minor errors (); but she apparently knows the skills well enough to enjoy the game.	(in passing the ball)	(in catching the ball)	(in dribbling the ball)	(in timing & judgment in rebounding the ball)	(in knowing & using body control to usually evade or hinder the opponent)
2. Can execute the basic skills, if the game is slowed down to her level of speed, of (); she may or may not enjoy the game depending upon whether she is disturbed by her own errors.	(passing the ball)	(catching the ball)	(dribbling the ball)	(having good timing & judgment in rebounding the ball)	(using body control, but is sometimes ineffective in evading or hindering her opponent)
1. (); she is almost dependent on her teammates to help her to get out of situations where she lacks the skill to do so.	(Performs skills of passing the ball poorly)	(Performs skill of catching the ball poorly)	(Performs skill of dribbling the ball poorly)	(Is inaccurate in her timing & judgment in rebounding the ball)	(Has some body control but very seldom uses it to evade or hinder opponent)

APPENDIX C

INDIVIDUAL RATING CARD

OBS	NO	COLOR	JUDGE NO	DATE					
RATING	SCORE	PASSING	CATCHING	DRIBBLING	REBOUNDING	BODY CONTROL			
Excellent	5	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5	4	3	2 1
Good	4								
Average	3								
Fair	2								
Poor	1								

WRITE COMMENTS HERE

APPENDIX C.--Individual Rating Card.

APPENDIX D

BALL CONTROL TEST DIRECTIONS

Ball Control Test Directions

1st RUN*

This is a test of skill and speed. The idea is to get from the start to the finish as quickly as possible and without any basketball rule violations. You cannot double dribble, travel, or step on any lines during the test. The ball must be thrown on or above the line on the wall. You will have four trials to get at least one trial which has no violations. Go slow enough on the first trial to get a perfect trial. Then speed up and try for three more perfect trials. If you should make a violation, please continue as best as you can. Do NOT stop once you start. Remember you are trying to complete the test as fast as you can with as few violations as possible with at least one error-free trial.

You will follow a pattern with your feet. At the signal READY - Go, you will follow the pattern as follows (DEMONSTRATE, BUT DO NOT TALK). You start by placing the right foot into the first square, the left in the next square, then the right in the next square. The next step is to the left with the left foot to side step the obstacle. This is where you release the ball. While you are awaiting for the ball to return, you may take a step with the right foot, then left and retrieve the ball. Now you are ready to take a step to the right to side step the second obstacle, then take one step with the left foot, and off with the right foot.

Continue dribbling with control as fast as you can going counterclock-wise around the far obstacle. Turn toward the wall. Dribble back as quickly as possible. Your time stops as soon as you touch the floor across the finish line. You must have control of the ball.

Take two (one) practice trials. It is to your advantage to practice these trials with a dribble so when you take the next four trials which count, you will be ready. You do not have to dribble around the far obstacle on the practice trials.

*Only underlined words were read for the 2nd Run.

APPENDIX E

BASKETBALL SKILL TESTS DIRECTIONS

Basketball Skill Tests Directions

TEST 3 - Front Shot

1. Must shoot from shooting point only--from behind line
2. Take 15 shots - 5 at a time (1 practice shot only)
3. Scoring - 2 pts. each basket made
1 pt. each miss if ball hits rim first
0 pts. each miss, or if ball hits backboard
first
4. Record each shot - put 0, 1, or 2 for each shot in proper space on score card
0 1 1 0 2 / 2 2 0 0 0 / 1 1 1 2 0 / (EXAMPLE)

TEST 4 - Side Shot

1. Take all shots from behind marks (lines)
2. Take 10 shots from each side - 5 at a time (1 practice shot only)
3. Scoring - 2 pts. each basket made
1 pt. each miss if ball hits rim anytime
0 pts. each complete miss
4. Record each shot - 20 in all - in proper space on score card
0 1 1 0 2 / 2 2 0 0 0 / 1 1 1 2 0 / 0 1 1 0 2 / (EXAMPLE)

TEST 5 - Foul Shot

1. Take shots from anywhere behind free throw line
2. Take 20 shots - 5 at a time (1 practice shot only)
3. Scoring - 1 pt. each basket made
0 pts. each basket missed
4. Record each shot in proper space on score card
0 0 1 0 1 / 1 0 1 1 1 / 0 0 0 0 1 / 1 0 1 1 1 / (EXAMPLE)

TEST 6 - Underbasket Shot

1. Shoot from anywhere you wish, use any type of shot (if lose control, may restart once)
2. Shoot as many baskets as you can in 30 seconds.
Take three trials
3. If ball has left your hands on signal stop, then basket counts if made
4. Record number of baskets made in proper space on score card
10 / 13 / 5 / (EXAMPLE)

TEST 7 - Speed Pass

1. Stand behind line on all passes, on signal 'Go,' pass the ball against the wall 10 times as fast as you can. Use any pass, ball may hit anywhere on wall. Ball must be caught and thrown each time.

2. Score is time it takes to complete 10 passes. Start time when ball first hits wall, stop when it hits 10th time. Take 3 trials.
3. Record in seconds and tenths in proper space on score card
15.1 / 20.3 / 21.8 / (EXAMPLE)

TEST 8 - Jump & Reach

1. Stand with side to wall, knees straight, reach as high as you can with fingertips on tape. Record this height on first blank (Example 80½")
2. Jump & touch tape as high as you can. Record in proper space on score card
3. Take 2 jump trials. Record both (1 practice jump only)
80½" / 92½" / 95" / (EXAMPLE)

TEST 9 - Overarm Pass

1. Throw from behind line (if take a step both feet must remain behind the line)
2. Pass must be made with one hand only
3. Take 10 passes (1 practice pass only)
4. Scoring - 3 pts. - center circle (If ball hits on a line, count higher score)
2 pts. - 2nd circle
1 pt. - outside circle
5. Record each pass in proper space on score card
1 2 2 2 3 1 3 3 1 2 / (EXAMPLE)

TEST 10 - Push Pass

1. Throw with both feet behind line
2. 2-hand push or chest pass must be used
3. Take 10 passes (1 practice pass only)
4. Scoring - 3 pts. - center circle (If ball hits on a line, count higher score)
2 pts. - 2nd circle
1 pt. - outside circle
1 2 2 2 3 1 3 3 1 2 / (EXAMPLE)

TEST 11 - Dribble

1. Start behind line, on signal 'Go,' dribble to right of first chair, weave in and out of remaining chairs until you get back to the starting line
2. Legal dribbles must be used (1 practice trial only)
3. Take 3 trials. Record time in seconds and tenths in proper space on score card.
15.1 / 20.3 / 21.8 / (EXAMPLE)

TEST 12 - Passing

1. Stand in area A, on signal 'Go,' throw ball to area A on wall. Run to area B to catch ball on rebound. Stand in area B & throw ball to area B on wall. Run to area A to catch rebound. Continue.
2. Use any type of pass & traveling is not penalized. Must stand behind 7'6" line
3. Take 3 trials
4. Scoring - successful hits made in proper wall area without committing line violations in 20 seconds.
5. Record number of hits made in proper space on score card.
8 / 11 / 10 / (EXAMPLE)

APPENDIX F

**MULTIPLE CORRELATION OF JUDGES' RATINGS WITH
BATTERIES OF BASKETBALL SKILL TESTS NOT
HOLDING THE BALL CONTROL TEST**

APPENDIX F.--Multiple Correlation of Judges' Ratings with Batteries of Basketball Skill Tests Not Holding the Ball Control Test.

	Battery of Tests	R ²	$\bar{R}$	S.E. of Estimate	F	Sig. of F
A	Dribble, Underbasket Shot, Front Shot, Speed Pass, Jump and Reach, Edgren Pass, Overarm Pass, Ball Control, Foul Shot, Side Shot, Push Pass	.68	.70	10.03	3.60	<.05
B	Dribble, Underbasket Shot, Front Shot, Speed Pass, Jump and Reach, Edgren Pass, Overarm Pass, Ball Control, Foul Shot, Side Shot	.68	.72	9.78	4.16	<.05
C	Dribble, Underbasket Shot, Front Shot, Speed Pass, Jump and Reach, Edgren Pass, Overarm Pass, Ball Control, Foul Shot	.67	.73	9.57	4.83	<.05
D	Dribble, Underbasket Shot, Front Shot, Speed Pass, Jump and Reach, Edgren Pass, Overarm Pass, Ball Control	.67	.74	9.39	5.62	<.05
M	Dribble, Underbasket Shot, Front Shot, Speed Pass, Jump and Reach, Edgren Pass, Overarm Pass	.67	.75	9.23	6.61	<.05
N	Dribble, Underbasket Shot, Front Shot, Speed Pass, Jump and Reach, Edgren Pass	.66	.76	9.10	7.89	<.05
O	Dribble, Underbasket Shot, Front Shot, Speed Pass, Jump and Reach	.65	.77	9.03	9.47	<.05
P	Dribble, Underbasket Shot, Front Shot, Speed Pass	.63	.76	9.11	11.26	<.05
Q	Dribble, Underbasket Shot, Front Shot	.61	.75	9.28	13.82	<.05
R	Dribble, Underbasket Shot	.54	.71	9.83	16.54	<.05

APPENDIX G

REGRESSION COEFFICIENTS, PARTIAL CORRELATION
COEFFICIENTS, COEFFICIENTS OF DETERMINATION,
AND BETA WEIGHTS OF SKILL TESTS IN BATTERIES
CONTAINING THE BALL CONTROL TEST

APPENDIX G.--Regression Coefficients, Partial Correlation Coefficients,
Coefficients of Determination, and Beta Weights of Skill Tests in Batteries
Containing the Ball Control Test.

Batteries of Tests	Reg. Coef.	F of Reg.Coef.	Sig. of Reg.Coef.	Beta Weight	Part. Corr. Coef.	Coef. of Det.
Constant	161.92	7.69	.012			
Ball Control	-1.18	.31	.583	-.12	-.13	.0568
Underbasket Shot	1.94	3.89	.063	.35	.41	.2059
Dribble	-2.45	1.54	.230	-.29	-.27	.1791
Front Shot	.84	1.14	.300	.24	.24	.1054
Speed Pass	-3.52	1.47	.240	-.31	-.27	.1881
Jump and Reach	-.68	.49	.492	-.14	-.16	-.0281
Edgren Pass	-.90	.15	.704	-.08	-.09	-.0392
Overarm Pass	-.28	.11	.740	-.07	-.08	-.0149
Foul Shot	.59	.17	.684	.09	.09	.0523
Side Shot	-.17	.07	.789	-.06	-.06	-.0226
Push Pass	-.11	.02	.880	-.03	-.04	-.0068
Constant	161.09	8.07	.010			
Ball Control	-1.16	.32	.580	-.11	-.12	.0555
Underbasket Shot	1.91	4.20	.054	.35	.42	.2018
Dribble	-2.46	1.63	.216	-.30	-.27	.1798
Front Shot	.83	1.18	.291	.23	.24	.1041
Speed Pass	-3.51	1.53	.230	-.31	-.27	.1871
Jump and Reach	-.68	.52	.477	-.14	-.16	-.0282
Edgren Pass	-.91	.16	.694	-.08	-.09	-.0396
Overarm Pass	-.36	.34	.569	-.09	-.13	-.0192
Foul Shot	.64	.23	.638	.09	.11	.0570
Side Shot	-.17	.08	.782	-.06	-.06	-.0227

APPENDIX G.--Continued.

Batteries of Tests	Reg. Coef.	F of Reg.Coef.	Sig. of Reg.Coef.	Beta Weight	Part. Corr. Coef.	Coef. of Det.
Constant	164.38	9.18	.006			
Ball Control	-.86	.25	.624	-.09	-.11	.0415
Underbasket Shot	1.90	4.35	.049	.34	.41	.2008
Dribble	-2.58	1.96	.176	-.31	-.29	.1882
Front Shot	.69	1.42	.247	.20	.25	.0873
Speed Pass	-3.82	2.25	.148	-.34	-.31	.2038
Jump and Reach	-.77	.78	.388	-.16	-.19	-.0318
Edgren Pass	-.99	.20	.658	-.09	-.10	-.0432
Overarm Pass	-.36	.34	.564	-.09	-.13	-.0190
Foul Shot	.53	.18	.678	.08	.09	.0467
Constant	175.04	13.83	.001			
Ball Control	-.83	.23	.632	.08	-.10	.0396
Underbasket Shot	2.02	5.77	.025	.37	.46	.2141
Dribble	-2.91	3.21	.087	.35	-.36	.2129
Front Shot	.77	2.05	.167	.22	.29	.0973
Speed Pass	-4.05	2.75	.112	-.36	-.33	.2159
Jump and Reach	-.83	.97	.336	-.18	-.21	-.0343
Edgren Pass	-1.29	.39	.539	-.11	-.13	-.0558
Overarm Pass	-.34	.33	.574	-.08	-.12	-.0182
Constant	173.25	14.02	.001			
Ball Control	-.78	.22	.645	-.08	-.10	.0375
Underbasket Shot	1.88	5.63	.026	.34	.44	.1991
Dribble	-2.83	3.15	.089	-.34	-.35	.2068
Front Shot	.77	2.10	.161	.22	.29	.0971
Speed Pass	-4.35	3.44	.077	-.38	-.36	.2321
Jump and Reach	-.91	1.23	.278	-.19	-.23	-.0377
Edgren Pass	-1.57	.63	.432	-.14	-.16	-.0683

APPENDIX G.--Continued.

Batteries of Tests	Reg. Coef.	F of Reg.Coef.	Sig. of Reg.Coef.	Beta Weight	Part. Corr. Coef.	Coef. of Det.
Constant	150.27	17.44	<.0005			
Ball Control	-.75	.20	.657	-.07	-.09	.0358
Underbasket Shot	1.76	5.20	.032	.32	.42	.1866
Dribble	-2.34	2.57	.122	-.28	-.31	.1712
Front Shot	.63	1.61	.216	.18	.25	.0801
Speed Pass	-4.06	3.12	.090	-.36	-.34	.2169
Jump and Reach	-.80	1.00	.328	-.17	-.20	-.0332
Constant	125.50	23.16	<.0005			
Ball Control	-1.26	.64	.430	-.13	-.16	.0607
Underbasket Shot	1.68	4.77	.039	.30	.40	.1775
Dribble	-2.25	2.38	.136	-.27	-.29	.1646
Front Shot	.79	2.82	.106	.23	.32	.1003
Speed Pass	-2.63	2.14	.156	-.23	-.28	.1401
Constant	104.57	22.04	<.0005			
Ball Control	-1.11	.48	.496	-.11	-.13	.0532
Underbasket Shot	1.76	5.10	.033	.32	.40	.1869
Dribble	-3.38	7.09	.013	-.41	-.46	.2467
Front Shot	1.00	4.65	.041	.28	.39	.1258
Constant	111.61	22.61	<.0005			
Ball Control	-.56	.11	.744	-.06	-.06	.0268
Underbasket Shot	2.33	8.85	.006	.42	.50	.2470
Dribble	-3.69	7.56	.011	-.44	-.47	.2696

APPENDIX G.--Continued.

Batteries of Tests	Reg. Coef.	F of Reg.Coef.	Sig. of Reg.Coef.	Beta Weight	Part. Corr. Coef.	Coef. of Det.
Constant	87.55	13.09	.001			
Ball Control	-3.03	3.63	.067	-.30	-.34	.1454
Underbasket Shot	2.55	8.67	.006	.46	.49	.2702
Constant	133.49	41.21	<.0005			
Ball Control	-4.89	8.89	.006	-.48	-.48	.2347

APPENDIX H

REGRESSION COEFFICIENTS, PARTIAL CORRELATION
COEFFICIENTS, COEFFICIENTS OF DETERMINATION,
AND BETA WEIGHTS OF SKILL TESTS IN BATTERIES
NOT HOLDING THE BALL CONTROL TEST

APPENDIX H.---Regression Coefficients, Partial Correlation Coefficients,
Coefficients of Determination, and Beta Weights of Skill Tests in Batteries
Not Holding the Ball Control Test.

Batteries of Tests	Reg. Coef.	F of Reg.Coef.	Sig. of Reg.Coef.	Beta Weight	Part. Corr. Coef.	Coef. of Det.
Constant	161.92	7.69	.01			
Dribble	-2.45	1.54	.23	-.29	-.27	.1791
Underbasket Shot	1.94	3.89	.06	.35	.41	.2059
Front Shot	.84	1.13	.30	.24	.24	.1054
Speed Pass	-3.52	1.47	.24	-.31	-.27	.1881
Jump and Reach	-.68	.49	.49	-.14	-.16	-.0280
Edgren Pass	-.90	.15	.70	-.08	-.09	-.0391
Overarm Pass	-.28	.11	.74	-.07	-.08	-.0149
Ball Control	-1.18	.31	.58	-.12	-.13	.0568
Foul Shot	.59	.17	.68	.09	.09	.0523
Side Shot	-.17	.07	.79	-.06	-.06	-.0226
Push Pass	-.11	.02	.88	-.03	-.04	-.0068
Constant	161.09	8.07	.01			
Dribble	-2.46	1.63	.22	-.30	-.27	.1798
Underbasket Shot	1.91	4.20	.05	.35	.42	.2019
Front Shot	.83	1.18	.29	.23	.24	.1041
Speed Pass	-3.51	1.53	.23	-.31	-.27	.1871
Jump and Reach	-.68	.52	.48	-.14	-.16	-.0283
Edgren Pass	-.91	.16	.69	-.08	-.09	-.0396
Overarm Pass	-.36	.34	.57	-.09	-.13	-.0192
Ball Control	-1.16	.31	.58	-.11	-.12	.0556
Foul Shot	.64	.23	.64	.09	.11	.0570
Side Shot	-.17	.08	.78	-.06	-.06	-.0228

APPENDIX H.--Continued.

Batteries of Tests	Reg. Coef.	F of Reg.Coef.	Sig. of Reg.Coef.	Beta Weight	Part. Corr. Coef.	Coef. of Det.
Constant	164.38	9.18	.006			
Dribble	-2.58	1.96	.18	-.31	-.29	.1882
Underbasket Shot	1.90	4.35	.05	.34	.41	.2008
Front Shot	.69	1.42	.25	.20	.25	.0873
Speed Pass	-3.8	2.25	.15	-.34	-.31	.2038
Jump and Reach	- .77	.78	.39	-.16	-.19	-.0318
Edgren Pass	- .99	.20	.66	-.09	-.10	-.0432
Overarm Pass	- .36	.34	.56	-.09	-.13	-.0190
Ball Control	- .86	.25	.62	-.09	-.11	.0415
Foul Shot	.53	.18	.68	.08	.09	.0467
Constant	175.04	13.83	.001			
Dribble	-2.91	3.21	.09	-.35	-.36	.2129
Underbasket Shot	2.02	5.77	.03	.37	.46	.2141
Front Shot	.77	2.05	.17	.22	.29	.0973
Speed Pass	-4.05	2.75	.11	-.36	-.33	.2159
Jump and Reach	- .83	.97	.34	-.18	-.21	-.0344
Edgren Pass	-1.29	.39	.54	-.11	-.13	-.0558
Overarm Pass	- .34	.33	.57	-.08	-.12	-.0181
Ball Control	- .83	.24	.63	-.08	-.10	.0396
Constant	172.70	14.07	.001			
Dribble	-3.26	5.11	.03	-.39	-.43	.2380
Underbasket Shot	2.14	7.35	.01	.39	.49	.2269
Front Shot	.71	1.91	.18	.20	.28	.0901
Speed Pass	-4.22	3.16	.09	-.37	-.35	.2251
Jump and Reach	- .95	1.46	.24	-.20	-.24	-.0395
Edgren Pass	-1.27	.39	.54	-.11	-.13	-.0552
Overarm Pass	- .33	.31	.58	-.08	-.12	-.0174

APPENDIX H.--Continued.

Batteries of Tests	Reg. Coef.	F of Reg.Coef.	Sig. of Reg.Coef.	Beta Weight	Part. Corr. Coef.	Coef. of Det.
Constant	171.10	14.27	.001			
Dribble	-3.16	5.03	.03	-.38	-.42	.2308
Underbasket Shot	2.00	7.36	.01	.36	.48	.2118
Front Shot	.72	1.97	.18	.20	.28	.0903
Speed Pass	-4.50	3.88	.06	-.40	-.37	.2403
Jump and Reach	-1.02	1.79	.19	-.22	-.26	-.0425
Edgren Pass	-1.55	.64	.43	-.14	-.16	-.0672
Constant	148.56	17.81	<.0005			
Dribble	-2.66	4.49	.04	-.32	-.39	.1947
Underbasket Shot	1.88	6.88	.02	.34	.46	.1989
Front Shot	.59	1.49	.23	.17	.24	.0739
Speed Pass	-4.22	3.54	.07	-.37	-.35	.2249
Jump and Reach	-.91	1.49	.23	-.19	-.24	-.0379
Constant	115.74	25.52	<.0005			
Dribble	-2.83	5.03	.03	-.34	-.40	.2068
Underbasket Shot	1.87	6.72	.02	.34	.45	.1983
Front Shot	.74	2.55	.12	.21	.30	.0939
Speed Pass	-2.53	2.02	.17	-.22	-.27	.1350
Constant	96.65	26.13	<.0005			
Dribble	-3.85	13.26	.001	-.46	-.57	.2812
Underbasket Shot	1.93	6.93	.01	.35	.45	.2049
Front Shot	.95	4.38	.05	.27	.37	.1194
Constant	107.35	31.02	<.0005			
Dribble	-3.93	12.32	.002	-.47	-.55	.2869
Underbasket Shot	2.40	10.55	.003	.44	.52	.2547

APPENDIX I

RAW DATA

APPENDIX I.--Raw Data--Ball Control Test.

Sub No.	1st Testing Session				2nd Testing Session			
	1	2	3	4	1	2	3	4
1	13.8 *(1)	14.5 (0)	14.7 (1)	14.6 (0)	14.3 (0)	14.0 (0)	13.6 (2)	14.5 (0)
2	14.8 (3)	14.5 (0)	14.1 (1)	14.9 (0)	12.5 (1)	16.7 (2)	14.5 (0)	16.1 (2)
3	12.7 (1)	12.6 (0)	11.9 (1)	10.6 (3)	11.4 (1)	10.0 (0)	10.1 (1)	11.0 (2)
4	13.1 (2)	11.5 (0)	10.2 (2)	11.4 (0)	11.2 (0)	10.9 (0)	10.9 (0)	9.9 (0)
5	14.1 (0)	12.8 (0)	12.5 (0)	12.4 (1)	13.5 (0)	13.5 (0)	11.8 (0)	12.8 (1)
6	13.5 (1)	12.6 (0)	13.1 (0)	12.5 (0)	13.1 (1)	12.6 (0)	15.1 (3)	12.7 (0)
7	12.5 (0)	19.5 (1)	13.6 (0)	12.2 (0)	12.5 (0)	13.7 (0)	11.6 (0)	12.5 (0)
8	12.2 (0)	11.5 (0)	11.1 (0)	10.6 (0)	11.0 (1)	12.0 (1)	10.6 (0)	10.2 (0)
9	13.5 (2)	14.0 (0)	12.9 (0)	12.6 (2)	14.8 (0)	12.6 (0)	11.3 (1)	15.3 (2)
10	13.6 (0)	13.6 (1)	12.6 (0)	12.4 (1)	13.2 (0)	12.9 (0)	12.5 (0)	12.2 (0)
11	13.8 (1)	13.8 (0)	14.6 (2)	13.9 (1)	14.0 (0)	13.4 (1)	12.1 (0)	12.3 (0)
12	12.8 (0)	13.2 (0)	12.3 (1)	13.2 (0)	13.4 (1)	12.6 (1)	13.0 (0)	12.8 (0)
13	12.3 (1)	12.2 (0)	11.3 (1)	11.8 (0)	12.2 (1)	12.2 (0)	12.1 (0)	12.1 (2)
14	13.9 (0)	14.3 (0)	13.8 (1)	13.9 (0)	13.7 (1)	13.4 (0)	12.7 (0)	12.6 (1)

APPENDIX I.--Continued.

Sub No.	1st Testing Session				2nd Testing Session			
	1	2	3	4	1	2	3	4
15	13.0 (0)	12.7 (0)	12.6 (0)	12.7 (0)	13.7 (2)	12.8 (0)	11.8 (1)	11.5 (0)
16	13.8 (1)	12.8 (2)	12.8 (1)	13.1 (1)	13.1 (2)	14.6 (1)	13.6 (1)	12.6 (0)
17	11.5 (2)	12.3 (0)	12.0 (0)	11.8 (0)	12.2 (0)	11.9 (0)	11.7 (0)	11.0 (0)
18	13.7 (1)	13.3 (1)	13.5 (0)	13.0 (0)	12.6 (0)	12.2 (1)	13.1 (0)	12.3 (0)
19	12.1 (0)	11.8 (0)	10.7 (1)	10.8 (0)	12.7 (0)	10.9 (0)	11.1 (2)	12.7 (1)
20	10.8 (0)	9.7 (0)	9.8 (0)	11.7 (4)	10.7 (0)	11.6 (1)	10.4 (0)	10.1 (0)
21	13.3 (0)	12.5 (0)	11.8 (0)	11.9 (0)	12.4 (0)	12.9 (0)	12.0 (0)	11.8 (0)
22	11.3 (0)	10.8 (0)	10.0 (0)	10.3 (0)	11.4 (0)	10.7 (1)	10.5 (1)	10.6 (0)
23	15.2 (3)	13.7 (0)	13.7 (0)	12.5 (1)	14.7 (1)	13.8 (0)	13.2 (1)	14.9 (1)
24	15.0 (0)	14.3 (3)	11.6 (1)	12.4 (2)	11.1 (0)	10.7 (0)	10.2 (0)	10.3 (1)
25	13.1 (0)	13.1 (0)	12.9 (0)	12.4 (0)	12.1 (0)	12.4 (0)	11.3 (0)	11.7 (0)
26	13.5 (0)	13.6 (0)	12.9 (0)	13.3 (0)	13.0 (0)	12.0 (1)	12.5 (0)	13.1 (0)
27	13.5 (0)	12.4 (1)	12.3 (0)	12.1 (1)	12.5 (0)	11.9 (0)	12.9 (0)	11.0 (0)
28	16.2 (0)	17.1 (1)	16.2 (0)	17.5 (2)	16.1 (0)	14.8 (0)	14.8 (1)	14.4 (1)

APPENDIX I.--Continued.

Sub No.	1st Testing Session				2nd Testing Session			
	1	Trials			1	Trials		
29	15.4 (2)	13.8 (1)	12.1 (3)	14.8 (0)	11.7 (0)	11.5 (0)	11.6 (1)	11.1 (0)
30	13.5 (0)	14.0 (0)	12.4 (0)	12.9 (0)	12.8 (0)	12.4 (0)	12.5 (0)	11.9 (0)
31	13.9 (0)	12.3 (0)	11.6 (0)	11.4 (1)	10.9 (0)	10.8 (0)	10.7 (2)	11.0 (1)

* () Number of errors.

APPENDIX I.--Raw Data--Judges' Ratings.

Sub No.	Judge 1					Judge 2					Judge 3					Judge 4					Judge 5					Total Score				
	Total					Total					Total					Total					Total									
	*1	2	3	4	5	Score	1	2	3	4	5	Score	1	2	3	4	5	Score	1	2	3	4	5	Score	1		2	3	4	5
1	3	3	2	3	3	14	3	3	2	1	2	11	3	3	3	2	3	14	4	4	3	3	4	18	2	2	2	2	2	10
2	2	2	3	2	2	11	3	2	2	1	3	11	2	2	3	2	2	11	3	2	3	2	3	13	2	2	3	2	2	11
3	3	3	3	3	3	15	3	2	2	3	3	13	3	3	3	3	3	15	4	3	4	4	4	19	3	3	3	3	3	15
4	4	4	4	4	4	20	4	5	4	1	4	18	5	5	5	4	5	24	5	5	5	5	5	25	4	4	4	2	3	17
5	2	2	2	2	2	10	2	3	2	2	2	15	3	3	3	3	3	15	2	2	2	2	2	10	3	3	3	2	3	14
6	3	3	2	2	2	12	3	2	2	1	2	10	3	3	2	3	3	14	2	3	2	2	3	12	3	3	3	2	3	14
7	3	3	2	3	3	14	3	3	2	1	2	11	3	3	3	2	3	14	3	3	3	3	3	15	3	3	3	2	3	14
8	2	2	2	2	2	10	2	3	3	2	3	13	3	4	3	4	3	17	2	2	2	3	3	12	2	2	2	2	2	10
9	2	2	2	2	2	10	3	3	3	2	3	14	3	2	3	3	4	15	3	3	3	4	3	16	3	3	2	2	2	12
10	4	4	3	3	4	18	4	4	3	4	4	19	4	4	4	4	4	20	3	3	4	3	4	17	4	4	4	3	3	18
11	3	3	2	4	3	15	4	4	3	4	3	18	4	4	3	2	3	15	2	2	2	4	2	12	4	4	4	3	3	18
12	2	2	1	1	2	08	2	4	2	2	2	12	3	2	2	3	2	12	2	2	2	3	3	12	3	3	3	2	2	13
13	3	3	2	2	2	12	3	3	3	1	3	13	3	3	3	2	2	13	3	3	2	3	3	14	3	3	3	3	3	15
14	3	3	2	2	2	12	2	4	3	3	2	14	4	4	4	3	4	19	2	3	3	3	4	15	4	4	4	3	3	18
15	4	4	4	4	4	20	4	4	4	3	4	19	4	4	4	3	4	19	4	3	4	4	4	19	3	3	4	3	3	16
16	2	2	2	2	2	10	3	2	3	3	2	13	2	2	1	1	2	08	2	2	2	2	2	10	2	2	2	2	2	10
17	3	3	2	2	2	12	4	4	3	4	4	19	5	4	4	4	4	21	4	2	3	3	3	15	3	4	4	3	3	17
18	2	2	1	1	2	08	4	2	2	2	2	12	2	1	1	1	2	07	3	3	2	3	2	13	3	3	2	2	2	12
19	4	4	3	4	4	19	3	4	3	3	3	16	4	3	3	3	4	17	4	4	3	4	4	19	3	4	3	3	3	16
20	4	4	3	4	4	19	4	4	4	3	3	18	4	4	3	2	4	16	3	3	4	3	4	17	4	4	3	3	3	17
21	3	3	2	3	2	13	2	3	3	3	3	14	3	4	3	3	3	16	2	3	2	2	2	11	4	4	4	4	4	20
22	3	3	3	3	3	15	3	3	3	3	4	16	4	4	3	3	4	18	3	3	4	3	4	17	3	3	2	2	2	12
23	3	3	2	2	2	12	3	3	3	1	3	13	3	3	3	3	4	16	2	3	3	3	3	15	2	2	2	2	2	10
24	3	3	3	3	4	16	4	4	3	3	4	18	4	4	3	3	2	16	2	2	2	3	3	12	4	4	4	4	4	20
25	3	3	3	3	3	15	3	3	3	1	3	13	4	4	4	3	4	19	4	4	3	4	5	20	3	3	3	3	3	15
26	4	4	3	3	4	18	4	4	5	1	4	18	4	4	4	3	4	20	5	4	5	4	4	22	3	3	2	2	3	13
27	3	3	3	3	3	15	3	3	1	1	3	11	3	3	3	3	3	15	3	4	3	3	4	17	3	3	3	3	3	15
28	1	1	1	1	2	06	3	3	3	1	1	09	2	1	2	1	2	08	2	1	2	3	2	10	3	3	3	3	3	15

APPENDIX I.--Continued.

Sub No.	Judge 1					Judge 2					Judge 3					Judge 4					Judge 5					Total Score			
	<u> </u>					<u> </u>					<u> </u>					<u> </u>					<u> </u>								
	*1	2	3	4	5	Total Score	1	2	3	4	5	Total Score	1	2	3	4	5	Total Score	1	2	3	4	5	Total Score					
29	2	2	2	2	2	10	3	3	3	2	2	13	2	2	1	3	3	11	2	2	1	3	2	10	3	3	2	2	12
30	2	2	2	2	2	10	2	3	2	1	2	10	3	3	3	3	3	15	3	4	3	3	4	17	2	2	2	2	10
31	2	2	2	3	2	11	3	3	3	1	3	13	3	3	3	4	3	16	2	3	2	3	2	12	3	3	3	2	13

* 1 Passing
 2 Catching
 3 Dribbling
 4 Rebounding
 5 Body Control

APPENDIX I.--Raw Data--Front Shot Test.

[illegible]

APPENDIX I.--Raw Data--Side Shot Test.

Sub. No.	Trials																				Total Score
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1	0	1	1	1	1	1	0	1	0	0	2	0	0	2	1	0	1	2	0	0	14
2	2	1	1	0	2	1	1	0	1	0	0	0	0	0	0	1	1	1	0	1	13
3	0	0	1	1	0	1	0	1	1	1	0	0	1	1	1	2	1	0	1	0	13
4	2	1	0	1	1	0	0	0	0	1	1	1	1	2	1	1	2	1	1	1	18
5	0	0	0	1	1	0	1	0	0	0	0	1	0	1	1	1	1	1	1	0	10
6	1	1	1	0	0	0	1	0	2	2	1	1	0	0	1	1	1	1	1	1	16
7	1	1	2	1	1	1	1	0	1	2	0	2	1	1	1	1	1	1	1	1	21
8	1	2	1	1	0	1	1	2	2	2	2	1	1	1	1	2	2	2	1	1	27
9	1	0	0	1	1	1	0	1	2	2	0	1	1	0	0	1	1	1	0	1	15
10	1	1	0	2	1	1	1	2	2	1	2	1	1	2	2	2	1	2	0	1	26
11	0	1	1	1	1	1	0	0	0	0	1	1	1	0	0	0	2	1	0	0	11
12	1	1	1	0	0	0	0	1	1	1	1	1	1	0	1	0	2	2	1	1	16
13	1	1	1	1	1	1	0	2	1	2	1	1	2	1	2	1	1	1	1	1	23
14	1	1	1	1	1	1	1	1	0	2	1	2	1	0	1	1	1	1	1	1	20
15	1	1	1	2	2	0	2	1	0	0	2	1	1	1	1	1	0	0	1	0	18
16	1	1	1	1	2	1	2	1	1	1	0	2	2	0	0	1	0	1	2	0	19
17	2	0	1	0	1	1	1	2	2	0	0	1	1	1	1	1	2	1	2	2	22
18	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
19	2	1	1	1	1	1	1	1	2	1	1	0	2	0	1	1	1	1	1	1	21
20	2	0	1	1	1	1	1	1	1	1	0	0	1	2	0	0	0	1	1	0	15
21	2	0	1	0	2	2	1	2	1	1	1	0	1	1	1	1	1	1	2	1	22
22	0	0	1	2	1	1	2	1	1	2	0	0	0	1	1	0	1	2	1	1	18
23	1	2	0	0	1	1	1	2	0	2	1	1	1	2	1	0	0	0	0	0	16
24	1	2	2	1	1	1	1	1	1	1	1	2	1	1	1	1	0	1	0	1	21
25	0	0	0	2	1	2	2	0	0	2	0	1	0	0	0	1	0	1	2	0	14
26	2	0	2	1	0	1	1	1	1	1	1	0	1	1	2	1	1	1	1	1	20
27	1	2	2	0	1	0	2	1	0	2	0	1	1	0	1	1	0	0	1	0	16
28	0	1	1	1	1	1	0	0	0	1	0	1	2	0	1	1	1	0	1	0	13
29	1	1	0	1	1	1	1	1	0	1	0	1	1	0	1	1	1	0	1	2	16
30	1	1	1	0	2	0	2	1	1	0	1	0	1	1	1	0	0	1	0	1	15
31	1	1	1	1	0	2	0	1	1	2	1	0	1	2	1	1	1	1	1	1	20

APPENDIX I.--Raw Data--Foul Shot Test.

Sub. No.	Trials																				Total Score
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
2	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	1	4
3	0	0	1	0	0	1	0	0	0	1	0	0	1	1	1	0	0	0	0	0	6
4	1	0	0	1	0	1	0	1	1	0	0	0	1	1	0	1	1	0	0	1	10
5	0	1	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	4
6	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	6
7	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	2
8	1	0	0	1	1	0	0	0	0	0	1	0	0	1	0	1	1	0	0	0	7
9	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	4
10	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	5
11	1	0	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	0	0	0	5
12	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	4
13	0	0	1	0	0	0	1	0	0	0	1	1	0	0	1	1	1	1	0	0	8
14	0	0	1	0	0	1	0	1	0	0	0	1	1	1	0	1	1	0	0	0	8
15	1	0	1	1	0	1	0	0	0	0	1	1	0	0	1	0	0	1	0	0	8
16	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	3
17	0	0	1	1	1	1	0	1	1	0	0	0	0	0	1	0	1	1	0	0	9
18	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
19	0	1	0	0	0	0	0	0	1	1	0	0	0	1	0	0	1	0	1	0	6
20	0	1	0	0	1	0	1	0	0	0	0	0	1	1	0	1	0	0	0	0	6
21	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	1	1	0	0	0	5
22	0	1	0	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	5
23	0	0	1	0	1	0	1	0	1	0	0	0	1	0	0	1	0	1	0	0	7
24	1	0	0	1	1	0	0	0	0	1	0	1	1	1	1	0	0	0	0	0	8
25	0	0	1	0	0	0	1	0	1	1	0	0	1	0	0	0	1	0	0	0	6
26	1	0	1	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	5
27	0	0	0	0	0	1	0	0	0	0	0	1	0	1	1	0	1	1	0	0	6
28	0	0	0	0	0	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	4
29	0	1	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	5
30	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3
31	0	0	0	1	0	0	0	1	1	0	0	0	1	0	1	0	0	1	0	0	6

APPENDIX I.--Raw Data--Underbasket Shot Test.

Sub. No.	Trials			Best Score
	1	2	3	
1	3	6	6	6
2	5	5	3	5
3	8	6	7	8
4	13	12	11	13
5	7	7	9	9
6	7	8	4	8
7	1	6	9	9
8	6	8	7	8
9	1	5	6	6
10	8	11	7	11
11	6	3	9	9
12	8	4	5	8
13	10	9	8	10
14	10	11	8	10
15	10	10	11	11
16	3	7	7	7
17	12	16	9	16
18	2	3	5	5
19	5	5	7	7
20	7	10	8	10
21	9	12	11	12
22	4	6	10	10
23	5	4	6	6
24	3	4	5	5
25	9	8	10	10
26	12	10	6	12
27	4	6	7	7
28	5	7	5	7
29	7	8	5	8
30	10	7	9	10
31	5	6	9	9

APPENDIX I.--Raw Data--Speed Pass Test.

Sub. No.	Trials (Seconds)			Best Score
	1	2	3	
1	12.3	14.9	12.9	12.3
2	15.6	13.6	13.0	13.0
3	11.5	11.5	12.1	11.5
4	10.0	10.1	9.6	9.6
5	13.6	13.8	13.1	13.1
6	18.6	14.1	13.1	13.1
7	13.6	13.0	15.5	13.0
8	11.6	11.1	11.4	11.1
9	13.6	14.1	12.6	12.6
10	12.0	11.9	12.0	11.9
11	12.0	14.1	15.6	12.0
12	18.0	15.7	14.8	14.8
13	15.4	14.6	17.3	14.6
14	11.9	11.4	11.3	11.3
15	12.5	12.1	12.0	12.0
16	16.5	15.0	14.6	14.6
17	11.3	10.5	10.6	10.5
18	14.2	12.6	13.4	12.6
19	11.0	11.2	10.8	10.8
20	11.1	11.5	10.5	10.5
21	15.3	11.1	11.0	11.0
22	12.3	11.3	11.4	11.3
23	12.5	11.6	11.7	11.6
24	12.6	11.4	11.1	11.1
25	13.6	13.6	11.6	11.6
26	12.5	12.1	11.9	11.9
27	11.4	11.0	11.5	11.0
28	13.1	12.5	14.6	12.5
29	10.5	10.5	10.6	10.5
30	13.0	12.0	12.6	12.0
31	18.0	12.4	13.3	12.4

APPENDIX I.--Raw Data--Overarm Pass Test.

Sub. No.	Trials										Total Score
	1	2	3	4	5	6	7	8	9	10	
1	2	2	2	3	2	2	2	2	0	2	19
2	3	2	3	2	3	2	2	3	2	2	24
3	2	2	3	2	2	3	3	3	3	3	26
4	1	2	3	3	2	2	3	3	3	3	25
5	3	3	3	3	3	2	2	2	3	3	27
6	2	2	2	3	3	2	2	3	2	3	24
7	3	3	3	3	3	3	3	2	2	2	27
8	2	2	2	3	3	2	3	2	2	2	23
9	3	2	2	2	3	3	3	2	3	2	25
10	1	2	2	3	3	2	3	3	0	3	22
11	2	3	3	2	2	3	3	3	2	2	25
12	2	3	2	3	2	2	2	2	3	3	24
13	3	3	3	3	3	2	3	3	3	3	29
14	3	3	3	3	3	2	3	3	3	2	28
15	2	3	3	3	3	3	3	2	2	3	27
16	3	2	3	2	3	2	3	1	2	3	24
17	3	3	2	3	2	3	3	3	3	3	28
18	3	0	2	2	3	0	2	3	2	2	19
19	2	3	2	2	3	2	2	3	3	3	25
20	3	3	3	3	3	3	3	3	3	3	30
21	2	3	2	3	3	3	3	3	2	2	26
22	2	3	3	3	3	3	3	3	2	3	28
23	3	1	2	1	0	2	0	3	0	1	13
24	3	3	2	2	3	3	3	3	3	2	27
25	2	2	2	2	3	3	2	2	3	2	23
26	2	2	3	3	3	2	2	3	3	3	26
27	3	2	3	3	3	3	2	3	3	2	27
28	2	2	3	2	3	3	3	3	3	2	26
29	3	3	3	3	2	3	3	3	3	3	29
30	3	3	3	2	2	1	3	3	3	2	25
31	2	3	2	3	3	3	3	2	2	3	26

[illegible]

APPENDIX I.--Raw Data--Dribble Test.

Sub. No.	Trials (Seconds)			Best Score
	1	2	3	
1	14.7	14.0	14.2	14.0
2	15.5	16.2	14.9	14.9
3	15.5	13.6	13.3	13.3
4	10.8	11.7	11.1	10.8
5	19.1	17.7	16.7	16.7
6	15.3	14.4	14.1	14.1
7	15.3	14.6	15.2	14.6
8	15.7	14.8	15.1	14.8
9	17.4	16.2	16.9	16.2
10	16.0	17.1	19.4	16.0
11	16.6	15.3	15.3	15.3
12	18.2	17.6	17.9	17.6
13	15.6	13.8	13.2	13.2
14	14.8	14.4	15.4	14.4
15	15.3	13.3	15.8	13.3
16	16.7	16.8	17.8	16.7
17	14.6	14.5	14.0	14.0
18	15.3	15.2	15.0	15.0
19	15.2	14.1	15.1	14.1
20	12.4	12.0	10.6	10.6
21	13.7	13.0	13.6	13.0
22	14.1	14.1	13.1	13.1
23	15.2	16.1	18.6	15.2
24	13.1	12.6	15.8	12.6
25	14.3	14.5	13.8	13.8
26	15.4	15.4	15.8	15.4
27	15.8	14.6	13.6	13.6
28	18.2	18.1	19.6	18.1
29	15.5	14.3	14.3	14.3
30	16.6	15.5	16.8	15.5
31	14.0	13.9	13.4	13.4

APPENDIX I.--Raw Data--Jump and Reach Test (inches).

Sub. No.	Stand Reach Height	Jump Height Trials		Best Height Jumped
		1	2	
1	84	97	97	13
2	85	96	97	12
3	84	102	103	19
4	84	100	101	17
5	85	98	100	15
6	86	99	99	13
7	82	94	96	14
8	87	103	104	17
9	84	98	98	14
10	83	96	98	15
11	88	101	103	15
12	98	101	102	04
13	84	95	96	12
14	81	94	94	13
15	89	102	102	13
16	79	90	90	11
17	85	99	99	14
18	76	87	89	13
19	92	102	103	11
20	84	97	98	14
21	87	103	103	16
22	81	96	95	15
23	80	92	94	14
24	83	97	99	16
25	81	97	98	17
26	80	92	93	13
27	80	95	94	15
28	84	95	98	14
29	90	109	110	20
30	82	98	99	17
31	86	97	98	12

APPENDIX I.--Raw Data--Modified Edgren Wall Pass Test.

Sub. No.	Trials			Best Score
	1	2	3	
1	4	6	9	9
2	4	8	9	9
3	6	4	6	6
4	9	8	11	11
5	6	5	7	7
6	6	7	8	8
7	5	8	9	9
8	7	9	9	9
9	4	7	8	8
10	8	9	9	9
11	5	9	8	9
12	7	7	8	8
13	7	8	9	9
14	6	7	9	9
15	8	7	10	10
16	1	6	7	7
17	8	9	8	9
18	4	7	4	7
19	8	7	9	9
20	5	8	10	10
21	9	10	10	10
22	10	8	11	11
23	6	7	6	7
24	4	7	8	8
25	6	6	8	8
26	7	8	7	8
27	8	9	10	10
28	7	6	7	7
29	9	9	10	10
30	6	7	8	8
31	6	7	8	8

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