A STUDY TO DETERMINE THE EFFECTIVENESS OF
TWO METHODS OF TEACHING BADMINTON

A Thesis
Presented to
the Faculty of the Physical Education for Women
Kansas State Teachers College of Emporia

In Partial Fulfillment
of the Requirements for the Degree
Master of Science in Education

by
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August 1964
ACKNOWLEDGMENTS

The author wishes to express gratitude and appreciation to the following persons: Miss Jeanne Galley, Head of the Department of Physical Education for Women, Kansas State Teachers College, Emporia, for her guidance and assistance in the preparation of this thesis; Miss Dorothy Martin for her guidance and valuable help with the data; Miss Mary Estes and the members of her class for cooperating in the pilot study, and to the students of Kansas State Teachers College for cooperating in this experiment.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. THE PROBLEM, DEFINITIONS OF TERMS USED, METHODS OF STUDY, AND LIMITATIONS OF THE STUDY</td>
<td>1</td>
</tr>
<tr>
<td>The Problem</td>
<td>2</td>
</tr>
<tr>
<td>Statement of the problem.</td>
<td>2</td>
</tr>
<tr>
<td>Definitions of Terms.</td>
<td>2</td>
</tr>
<tr>
<td>Skill test method</td>
<td>2</td>
</tr>
<tr>
<td>Traditional game method</td>
<td>2</td>
</tr>
<tr>
<td>Methods of the Study.</td>
<td>3</td>
</tr>
<tr>
<td>Limitations of the Study.</td>
<td>4</td>
</tr>
<tr>
<td>II. REVIEW OF THE LITERATURE.</td>
<td>5</td>
</tr>
<tr>
<td>III. PROCEDURES OF THE STUDY AND ANALYSIS AND INTERPRETATION OF DATA</td>
<td>10</td>
</tr>
<tr>
<td>Selection of Groups</td>
<td>10</td>
</tr>
<tr>
<td>Equation of the Groups.</td>
<td>11</td>
</tr>
<tr>
<td>Introduction and Practice of Badminton Skills</td>
<td>13</td>
</tr>
<tr>
<td>Development of a Badminton Performance Rating</td>
<td>15</td>
</tr>
<tr>
<td>Chart and Scale</td>
<td>16</td>
</tr>
<tr>
<td>Analysis and Interpretation of Data</td>
<td>16</td>
</tr>
<tr>
<td>IV. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS FOR FURTHER STUDY</td>
<td>22</td>
</tr>
<tr>
<td>Summary</td>
<td>22</td>
</tr>
<tr>
<td>Conclusions</td>
<td>24</td>
</tr>
<tr>
<td>Recommendations for Further Study</td>
<td>25</td>
</tr>
</tbody>
</table>
CHAPTER

BIBLIOGRAPHY ........................................... 26
APPENDIX A. Badminton Questionnaire and Results .... 30
APPENDIX B. Scott Motor Ability Test ................. 32
APPENDIX C. Lockhart and McPherson Badminton Test ... 36
APPENDIX D. Control Group Badminton Class Schedule .. 39
APPENDIX E. Experimental Group Badminton Class Schedule 44
APPENDIX F. Experimental Group Skill Tests in
Badminton and Experimental Group Floor
Pattern ..................................................... 50
APPENDIX G. Badminton Performance Rating Chart and
Badminton Performance Rating Scale .................. 68
APPENDIX H. Results of the Scott Motor Ability Test .... 71
APPENDIX I. Results of the Initial, Final and Net Gain
of the Lockhart and McPherson Badminton
Test ...................................................... 72
APPENDIX J. Results of the Judges' Ratings ............ 73
## List of Tables

<table>
<thead>
<tr>
<th>TABLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Mean, Standard Deviation, Standard Error of the Mean and T-Ratio of the Tests to Determine the Equality of the Control and Experimental Group.</td>
<td>18</td>
</tr>
<tr>
<td>II. Mean, Standard Deviation, Standard Error of the Mean and T-Ratio of the Scores Made on the Badminton Performance Rating Chart by the Control and Experimental Group.</td>
<td>19</td>
</tr>
<tr>
<td>III. Mean, Standard Deviation, Standard Error of the Mean and T-Ratio of the Second Administration and Net Gain Scores Made on the Lockhart and McPherson Badminton Test.</td>
<td>20</td>
</tr>
</tbody>
</table>
CHAPTER I

THE PROBLEM, DEFINITIONS OF TERMS USED, METHODS OF STUDY, AND LIMITATIONS OF THE STUDY

No one method of teaching activities can be precisely defined or rigidly adhered to because students, teachers, and situations vary from class to class and from day to day. No wise teacher will discard a method merely because it is considered old, or refuse to try one because it is new. Students vary in their ability to learn, in the way they learn, and consequently respond differently to different methods.

For many years a difference of opinion has existed regarding the effectiveness of the whole and the part method of teaching an activity. The law of exercise as stated by Kilpatrick says, "within limits, the more often a response is made to a situation, the closer becomes the bond connecting the two, and the more surely and smoothly is the response made when the situation presents itself again."¹

One difficulty in emphasizing game play is that situations requiring a certain reaction occur so irregularly that players have difficulty making the right judgment. Intelligent use of skill tests enables players to practice

skills and combinations of skills so that correct reactions are smooth and automatic.

I. THE PROBLEM

Statement of the problem. The purpose of this study was to determine the effectiveness of two methods of teaching badminton to two different groups. One group was instructed through use of skill tests prior to a game situation, and the second group was instructed in a game situation for learning the basic skills of badminton. The following question was to be answered: Will badminton taught by the use of skill tests result in the attainment of a higher level of skill than when taught by the traditional game method?

II. DEFINITIONS OF TERMS

Skill test method. The method of teaching badminton by having the subjects learn the basic skills through use of skill tests prior to a game situation.

Traditional game method. The method of teaching badminton by having the subjects learn the basic skills through a game situation.
III. METHODS OF THE STUDY

Twenty-seven women students enrolled in two regularly scheduled physical education badminton activity classes at Kansas State Teachers College were used in the study. Members of these groups included freshman, sophomore, and junior students. One class was designated as the control group and was taught by the traditional game method. The second class was designated as the experimental group and was taught by the skill test method. All subjects were given the Scott Motor Ability Test and the Lockhart and McPherson Badminton Test at the beginning of the learning period to determine whether or not the groups were equal in general motor ability and initial badminton playing ability.

The experimental group was given instruction for learning the basic skills of badminton by use of skill tests twice a week for six and one-half weeks. Instruction on playing the game of badminton was given twice a week for three and one-half weeks.

The control group was given instruction for learning the basic skills of badminton in a game situation but without any skill test experience. This group played twice a week for ten weeks. The control group practiced on days different than the experimental group. Neither group was informed of the different methods of instruction.
IV. LIMITATIONS OF THE STUDY

This study was limited to college women in two physical education badminton activity classes at Kansas State Teachers College, Emporia, Kansas. The number of subjects participating in this study was confined to twenty-seven students because of the scheduling process. The number of practice sessions was limited to two days a week for ten weeks, a total of fifteen hours.
CHAPTER II

REVIEW OF THE LITERATURE

The study of the superiority of the whole and part methods of learning has been one of constant controversy. According to Fehlstein, the following definitions are given for the whole and part methods of learning:

Whole method procedure demands the continuous repetition of an entire body of material until the desired stage of mastery is attained. Part method procedure demands an initial mastery of the definite sections of material and their final connection of these different sections in proper serial order.

Psychologists hold that behavior depends upon unified patterns. The essential feature of learning is the relating or combining of the various elements; the total pattern, interrelationships, and synthesis are emphasized. The human organism is seen as a unitary whole; complete responses and total personalities, rather than isolated reactions of a part of the organism, should be emphasized in considering the learning process. The organism as a whole, rather than any specific neural pattern, determines reactions. If the theories of field psychologists are correct, it would seem

that learning by wholes would be greatly superior to learning by parts, but this does not hold true in all areas of learning.

There are numerous reports of data collected on the whole-versus-part problem but few relate to the learning of motor skills. Inconsistency concerning the relative effect of the whole and part methods for learning motor skills has been found; these differences seem to arise from (1) lack of evidence showing what individual characteristics cause one person to learn a given skill more rapidly with one method while others profit more by another.

Studies by Combs\(^2\) and Stahmer,\(^3\) in the areas of track events and swimming, respectively, found that some individuals learn more rapidly with one method while others find more success with another method. The results of their studies indicated the whole method for learning track and swimming is better for subjects who are more intelligent, and more mature.


A study by Barton utilized the maze in the learning of motor skills by two different methods. By the whole method the learners always started at the entrance of the maze and continued in random effort until they completed the maze. By the part method the subjects learned each quarter separately in regular order, and then combined into a single unit and relearned as a whole. The results showed strong evidence that for maze learning, which is motor learning, the part method was more efficient.⁴

Shay studied the superiority of the whole or part methods of learning gymnastics by choosing the kip on the horizontal bar as the gymnastic exercise. The control group was taught by the whole method of learning, and the entire exercise was attempted at each trial. The experimental group, working with the progressive-part procedure, learned each of the movements in sections. The results of the study indicated that the whole learning method is superior to the part method in learning the kip on the horizontal bar.⁵


A study of whole and part methods was done by Knapp and Dixon. Two groups were equated on the basis of athletic experience in juggling. Both groups were divided to form two sections within each group. One section in group one used only the whole method of practice. The second section of group one was required to follow a fairly rigid procedure of practice. One section of group two was required to use only the whole method. The subjects in the second section of group two were permitted to freely choose their practice method. The results showed that equated groups learn juggling more rapidly by the whole method than by the rigid part-whole method or by a very flexible part-whole method.\(^6\)

Woodworth states that "...in a practical situation it is probably best to start with the whole method while feeling free to concentrate at any time on a part where something special is to be learned."\(^7\) John McGeoch also stresses the same point by suggesting "...employ the whole method with special attention to and repetition of difficult or


important parts as one goes along, thus combining the whole
method with a form of the part method."8

Hartman states the following in answer to the part
and whole method of learning motor skills:

Every distinctive motor skill—dancing, pole vaulting,
skiing, etc.—has a characteristic structure and that
the heart of such learning is in the vivid sensory per-
ception of this structure and its reproduction in the
pattern of movement of the body of the learner.9

From the review of literature no studies to determine
the superiority of the whole or part method of learning bad-
minton were found. There is a specific pattern for learning
almost every motor skill; therefore, the teacher may expect
repeated and inevitable patterns for learning of motor skills,
within sports and between sports.

8John A. McGeoch, *The Psychology of Human Learning*

9George W. Hartman, *Educational Psychology* (New York:
CHAPTER III

PROCEDURES OF THE STUDY AND ANALYSIS AND INTERPRETATION OF DATA

The purpose of this study was to determine the effectiveness of two methods of teaching badminton. To realize this purpose it was necessary (a) to select two groups; (b) to determine the equality of the groups; (c) to present and practice badminton skills; (d) to develop a badminton performance rating scale and chart; and (e) to compare the test results of the group who were taught badminton by the traditional method with the group who were taught badminton by the skill test method.

I. SELECTION OF GROUPS

Twenty-seven freshman, sophomore, and junior women students enrolled in two regular scheduled physical education badminton activity classes at Kansas State Teachers College, Emporia, were used as subjects. One class, composed of fourteen subjects, was taught by the traditional method and was designated as the control group. The second class of thirteen students was taught by the skill test method and was designated as the experimental group.

The personnel of each group was determined by voluntary class selection by the students within the usual
time and schedule limitations that are present in college enrollment procedures. Selection of specific activities to meet the four semester requirement in physical education at Kansas State Teachers College is optional for each woman student.

The students in the classes were given a questionnaire prior to the study to determine their previous experience in badminton. The questionnaire and the results for the two classes may be found in Appendix A, page 30. All subjects were limited in experience and would be classified as novice players.

II. EQUATION OF THE GROUPS

Prior to the instructional phase of this study, the Scott Motor Ability Test was administered to each class to determine the equality of the group in motor ability. The detailed description of the test may be found in Appendix B, page 32. This test was selected because it was designed to measure general motor ability through use of three skill items: (1) obstacle race, (2) basketball throw, and (3) standing broad jump. The three test items were used rather than the four test items because of the lack of time and wall space available. The test has a multiple correlation of .87 for validity and a reliability of .90, which shows an excellent coefficient of correlation.
The Lockhart and McPherson Badminton Test was administered prior to the instructional period of this study to all of the subjects to determine the badminton playing ability of each group. This test described in Appendix C, page 36, was designed to measure badminton playing ability. The test was selected because it required no specific equipment, involved only one player, needed a small amount of wall space, and tested many subjects simultaneously. The Lockhart and McPherson Badminton Test has a validity of .90 and a reliability of .90.

In appraising the value of the Scott Motor Ability Test and the Lockhart and McPherson Badminton Test, an analysis was made to determine if the tests were devised scientifically. This was accomplished through the application of two general evaluative criteria, scientific authenticity and administrative feasibility. The criteria used to evaluate a test in terms of scientific value are reliability, objectivity, and validity. In order for a test to meet the criteria of administrative feasibility it must be economical in terms of cost and time required for administration. The Scott Motor Ability Test and the Lockhart and McPherson Badminton Test met the two general evaluative criteria for this study.
III. INTRODUCTION AND PRACTICE OF BADMINTON SKILLS

The control group of fourteen women spent two days a week for ten weeks, a total of fifteen hours, learning the basic skills of badminton. The basic skills taught were (1) grip, (2) short serve, (3) long high serve, (4) overhead clears, (5) underhand clears, (6) drop shots, (7) net shots, (8) smash shots, (9) drives, (10) court positions, (11) footwork, (12) placement of shots, and (13) singles and doubles strategy. During the first week the basic skills of grip, serves, and placement of serves were presented by having the subjects work with partners on the courts. The next six weeks the subjects were presented the basic skills of clears, footwork, drop shots, net shots, smash shots, drives, court positions, and singles and doubles strategy. To complete each class period the students were placed in game situations of doubles and singles. The last three weeks of the study were devoted to playing a round robin tournament of doubles and singles. Detailed lessons for the control group may be found in Appendix D, page 39.

The experimental group of thirteen women spent two days a week for six and one-half weeks on skill tests and three and one-half weeks playing the game, a total of fifteen hours, learning the basic skills of badminton. During the first six and one-half weeks the skills were practiced by use
of skill tests, which were marked on the six courts. A description of the skill tests and the floor patterns of the six badminton courts used for the skill tests may be found in Appendix F, page 50. The basic skills taught through the use of skill tests were (1) short serve, (2) long high serve, (3) overhead clears, (4) underhand clears, (5) footwork by using a diagonal and shuttle run, (6) drop shots, (7) net shots, (8) smash shots, and (9) wrist action by using a wrist volley test. Courts one through six were used for the shuttle run, diagonal run, net shots, and drop shots. Courts two, three, five and six were used for the serves, clears, and smash shots.

The subjects worked with partners at all times and rotated to the marked badminton courts to practice the skills. The subjects' scores and times each day were recorded on a chart. The chart was used to motivate the students to improve their scores and to inform the students of their improvement in relation to the other members of the class. For the remaining three and one-half weeks the students were placed in game situations of doubles and singles. Details of the day by day lessons for the experimental group may be found in Appendix E, page 44.
IV. DEVELOPMENT OF A BADMINTON PERFORMANCE RATING CHART AND SCALE

No badminton performance rating chart or scale suitable to the study was available from the literature, therefore one was developed to determine the badminton playing ability of subjects after ten weeks of instruction. The badminton performance rating chart was based on a scale of one through five. A rating of five was superior, four was good, three was average, two was fair, and one was poor. The badminton performance rating chart consisted of ten divisions which were as follows: (1) grips, (2) accuracy of placement, (3) backswing, (4) bird contact, (5) follow-through, (6) weight shift, (7) service, (8) preparing to receive, (9) getting into position, and (10) footwork. The chart and scale may be found in Appendix G, page 68.

To determine the validity of the badminton performance rating chart and scale a pilot study was conducted in a third badminton activity class taught by another instructor at Kansas State Teachers College. Eighteen subjects were in the pilot study. A round robin tournament was played to determine the rank order of each student in badminton playing ability. A board consisting of three judges rated the playing ability of each student through use of the badminton performance rating chart and scale. The judges included the investigator,
the instructor of the class, and a senior major student assisting in the class. The first nine subjects from the tournament rank order listing were judged one day, the remaining nine were judged the next class meeting. The judges were given the badminton performance rating chart and scale one week prior to the judging in order to become familiar with this instrument for determining badminton playing ability.

Pearson's zero order correlation coefficient between the judges' rating and the rank order of players was used to determine the validity of the badminton performance rating chart. A validity of .93 was found. Opinions pertaining to the badminton performance rating chart and scale were obtained from the three judges. All judges felt the chart and scale were an acceptable means of evaluation.

V. ANALYSIS AND INTERPRETATION OF DATA

The statistical technique used to determine the effectiveness of two methods of instructing badminton was the significance of the difference between the means of the groups. To use this technique it was necessary to find the mean, standard deviation, and standard error of the difference between means in small independent samples. The t-ratio was then applied to determine the significance of the difference of t for each group. The level of confidence used for the study was .05. For twenty-five degrees of freedom a t of 2.06
must be obtained at the .05 per cent level of confidence for the findings to be considered significant.

Two tests, the Scott Motor Ability Test and the Lockhart and McPherson Badminton Test, were administered to the experimental group and the control group at the beginning of the study to determine the equality of the groups in motor ability and badminton playing ability.

The scores for the obstacle race, basketball throw and standing broad jump of the Scott Motor Ability Test, were converted into T-scores with the highest score representing the best score. The results of the test may be found in Appendix H, page 71. The results of the Lockhart and McPherson Badminton Test were established from the raw scores and may be found in Appendix I, page 72.

The means, standard deviations, standard error of the means, and t-ratios were computed for each group and may be found in Table I, page 18. The standard error of the difference between means was computed to ascertain the significant difference of the means. The t-ratio for the Scott Motor Ability Test was .31 which was not significant at the .05 level of confidence. The t-ratio for the Lockhart and McPherson Badminton Test was 1.45 which was not significant at .05 level of confidence. Therefore, the two groups were considered equal in initial motor ability and badminton playing ability for the purpose of this study.
After both groups had received ten weeks of instruction in learning the basic skills of badminton, a board consisting of three judges rated each subject in a game situation to determine group improvement. The judges graded the badminton playing ability of the twenty-seven subjects on a one to five point scale. The badminton performance rating chart and scale were used to rate each student. Half of the control and experimental group was judged one day, the remaining half was judged the next class period. Three women physical education teachers at Kansas State Teachers College were selected to judge the badminton playing ability of the subjects.

**TABLE I**

**MEAN, STANDARD DEVIATION, STANDARD ERROR OF THE MEAN AND T-RATIO OF THE TESTS TO DETERMINE THE EQUALITY OF THE CONTROL AND EXPERIMENTAL GROUP**

<table>
<thead>
<tr>
<th>Test</th>
<th>Cont.</th>
<th>Exp.</th>
<th>Cont.</th>
<th>Exp.</th>
<th>SE*</th>
<th>T-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scott Motor Ability Test</td>
<td>155.86</td>
<td>159.69</td>
<td>34.10</td>
<td>28.03</td>
<td>12.53</td>
<td>.31</td>
</tr>
<tr>
<td>Lockhart and McPherson Badminton Test</td>
<td>40.43</td>
<td>49.00</td>
<td>12.00</td>
<td>17.06</td>
<td>5.86</td>
<td>1.45</td>
</tr>
</tbody>
</table>

*Note: The abbreviations used in this table and in Table II and Table III following are interpreted as follows: M = mean; SD = standard deviation; and SE = standard error of the mean. The judges used for this study had considerable previous experience in teaching badminton. The judges were given the
badminton performance rating chart and scale one week prior to the judging to study the method used to rate each student.

The results of the judges' ratings may be found in Appendix J, page 73. The mean, standard deviation, standard error of the mean, and t-ratio was computed for each group and may be found in Table II. The t-ratio of .007 does not reach the .05 level of confidence; therefore, the mean difference was marked "not significant."

**TABLE II**

Mean, Standard Deviation, Standard Error of the Mean, and T-ratio of the scores made on the Badminton Performance Rating Chart by the Control and Experimental Group

<table>
<thead>
<tr>
<th>Test</th>
<th>M</th>
<th>SD</th>
<th>SE</th>
<th>T-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Badminton Performance Rating Chart</td>
<td>73.71</td>
<td>73.77</td>
<td>16.85</td>
<td>22.11</td>
</tr>
</tbody>
</table>

The Lockhart and McPherson Badminton Test was administered again to both groups at the close of the instruction period to determine group learning and improvement. The results of the final performance scores and the net gain of each student on the Lockhart and McPherson Badminton Test may be found in Appendix I, page 72. The means, standard deviations, standard error of the means, and t-ratios were computed for each group on the final performance scores and net gain of the Lockhart and McPherson Badminton Test,
and are presented in Table III. The t for the second administration of the Lockhart and McPherson Badminton Test was .26 which was not significant at the .05 level of confidence. The large standard deviation, in comparison with the mean, indicates that the data are variable and hence heterogeneous, whereas the small deviation shows that the group is quite homogeneous. In this situation the extreme difference between the standard deviation is apparently due to the fact the experimental group practiced the wall volley each day and the control group did not practice the wall volley test during the ten weeks of instruction.

TABLE III

MEAN, STANDARD DEVIATION, STANDARD ERROR OF THE MEAN, AND T-RATIO OF THE SECOND ADMINISTRATION AND NET GAIN SCORES MADE ON THE LOCKHART AND MOPHERSON BADMINTON TEST

<table>
<thead>
<tr>
<th>Lockhart &amp; McPherson Badminton Test</th>
<th>M</th>
<th>SD</th>
<th>SE</th>
<th>T-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second administration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cont.</td>
<td>75.64</td>
<td>73.62</td>
<td>20.26</td>
<td>6.29</td>
</tr>
<tr>
<td>Exp.</td>
<td>73.62</td>
<td>20.26</td>
<td>6.29</td>
<td>7.73</td>
</tr>
<tr>
<td>Net gain</td>
<td>35.21</td>
<td>24.62</td>
<td>12.50</td>
<td>6.74</td>
</tr>
</tbody>
</table>

The final performance scores obtained from the Lockhart and McPherson Badminton Test were compared with the initial performance scores to ascertain the net gain. The net gain of each student was used as another method to determine if there were any differences in group improvement. The t was 1.57 and does not reach the .05 level of
confidence. Therefore, the mean difference was marked "not significant."

The critical value of $t$ is 2.06 for the 5 per cent level of significance in this study. Referring to Tables II and III, pages 19 and 20 respectively, all of the computed $t$'s did not exceed 2.06; therefore, these $t$'s were not significant. When a statistically significant difference was not obtained it may be inferred that under similar conditions the same results would be expected.
CHAPTER IV

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS
FOR FURTHER STUDY

I. SUMMARY

The purpose of this study was to determine the effectiveness of two methods of teaching badminton. One group was instructed through use of skill tests and the second group was instructed in the traditional game play method. The Scott Motor Ability Test was administered to twenty-seven college women who were involved in this experiment. The test was given at the beginning of the study for the purpose of measuring the present status of motor ability. The Lockhart and McPherson Badminton Test was also administered to all of the subjects at the beginning of the study to determine the initial badminton playing ability of each group.

One group, designated as the control group, consisted of fourteen subjects and was given instruction for learning the basic skills of badminton in a game situation. The experimental group, consisting of thirteen subjects, was given instruction for learning the basic skills of badminton through use of skills tests prior to a game situation.
In a pilot study conducted at Kansas State Teachers College, eighteen subjects were used to determine the validity of the badminton performance rating chart and scale used in the study.

Data for the study were collected from twenty-seven women students enrolled in two regularly scheduled physical education badminton activity classes at Kansas State Teachers College, Emporia, Kansas. The results were determined from the scores made by the subjects on the badminton performance rating chart and scale and the retesting of the Lockhart and McPherson Badminton Test. On both tests, the statistical method used was the significance of the difference between means by finding the standard error of the difference between means in small independent samples. The mean score on the badminton performance rating chart was 73.71 for the control group and 73.77 for the experimental group. The second administration of the Lockhart and McPherson Badminton Test gave a mean score of 75.64 for the control group and 73.62 for the experimental group. The final test scores of the Lockhart and McPherson Badminton Test were compared with the initial test scores to ascertain the net gain. The mean score was 35.21 for the control group and 24.62 for the experimental group. Since the t does not reach the acceptable level .05, the obtained mean difference must be marked "not significant" for the difference in learning between the skill
test method and the traditional method of instructing badminton.

II. CONCLUSIONS

Within the limitations of this study, the badminton skill test method used with the experimental group did not produce a higher level of attained badminton skill than the traditional method used by the control group, therefore the study indicated no difference in the effectiveness of the two methods of teaching badminton.

At the 20 per cent level of confidence there is evidence that the control group gained more badminton playing ability, when comparing the final test scores of the Lockhart and McPherson Test with the initial test scores to ascertain the net gain.

Through observation it was noted that the experimental group appeared to enjoy the badminton skill tests and worked hard to improve their individual scores.

The resulting validity of .93 for the pilot study indicated that the badminton performance rating chart and scale may be used as a valid measure of badminton playing ability.
III. RECOMMENDATIONS FOR FURTHER STUDY

It is recommended that further studies be conducted shortening the time used for the skill tests and lengthening the time in the actual playing of the game.

It is recommended that further studies be conducted in other schools and at different age levels.

It is recommended that a further study might encompass the utilization of knowledge tests in comparing group improvement.

The author recommends the utilization of the badminton performance rating chart and scale in future studies and in grading students.
BIBLIOGRAPHY
BIBLIOGRAPHY

A. BOOKS


B. PERIODICALS


APPENDIX A
BADMINTON QUESTIONNAIRE

QUESTIONS:

1. Have you had a course in badminton?
   Yes____  No____

2. If so, when and how many courses?
   When____(a)  How many____(b)

3. Have you taken skill tests in badminton?
   Yes____  No____

4. Have you played badminton for recreation?
   Yes____  No____

5. Have you played badminton in an intramural program?
   Yes____  No____

6. Do you know a few of the basic strokes used in badminton?
   Yes____  No____

7. Do you know the positions for serving and receiving in
   singles and doubles?
   Yes____  No____

8. Do you know the court boundaries for singles and doubles?
   Yes____  No____

9. Do you know how to score a game of badminton for singles
   and doubles?
   Yes____  No____

10. Do you classify yourself as a beginner or an intermediate
    player?
    Beginner____  Intermediate____

The students that answered questions 6, 7, 8, and 9 "yes"
were asked to give specific information in regard to the
question. The questionnaire showed all students to be
limited in experience.
<table>
<thead>
<tr>
<th>Subject</th>
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<tr>
<td></td>
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<tr>
<td>Anderson</td>
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<td>Bryan</td>
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<td><strong>Experimental Group</strong></td>
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<td>Wenger</td>
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</table>
APPENDIX B

SCOTT MOTOR ABILITY TEST*

PURPOSE

This test is designed to measure the present status of high school and college women in terms of motor ability.

SEX AND AGE LEVEL

High school and college women.

OBSTACLE RACE

TEST ITEMS AND EQUIPMENT

The space needed is 55 feet by 12 feet; equipment needed, three jump standards and a cross bar at least 6 feet long; lines on the floor (see Figure 1, page 33).

LEADERSHIP

One timer, one recorder, and one scorer.

DESCRIPTION OF TEST

Start in a back-lying position on the floor with the heels at line a. On the signal, Ready, Go! get up and start running toward j. As you come to each square on the floor, step on it with both feet. Run twice around j, turn back to d, go under the cross bar, get up on the other side, run to line a and continue running between line b and a until you come to a for the third time.

SCORING

The score is the number of seconds (to nearest .1 second) that is required to run the course.

Figure 1. Floor markings for obstacle race

a = starting line
b = line for shuttle
c = finish line
d = cross-bar (18 inches high)
j = jump standard
s = spot on floor (12 x 18 inches)
---- = path of runner
x = distance from end of cross-bar to line of inner sides of spots, 4 feet 4 inches
BASKETBALL THROW

TEST ITEMS AND EQUIPMENT

Space needed is about 80 feet long and 20 feet wide, a throwing line marked about 3 feet from one end of the course and parallel lines every 5 feet beginning 15 feet in front of the throwing line.

LEADERSHIP

One scorer and one recorder.

DESCRIPTION OF TEST

Start anywhere you wish behind the throwing line, but do not step on or across the line when throwing. Throw in any way you wish, three consecutive times.

SCORING

The score is the distance from the throwing line to the spot where the ball touches the floor. Only the longest throw counts.

STANDING BROAD JUMP

TEST ITEMS AND EQUIPMENT

The test requires mats at least 7 1/2 feet long and the lines may be marked in 2-inch intervals. If the mat is marked in 2-inch intervals, it eliminates the need to measure each jump with a tape.

LEADERSHIP

One scorer and one recorder.

DESCRIPTION OF TEST

The subject toes the starting line which is marked on the mat, and springs forward from both feet. The nearest point touched by any part of the body, at right angles to the take-off line, is his jump. Measurements are taken to the nearest inch.
SCORING

The score is the distance from the edge of the take-off starting line to the nearest heel (or to the nearest part of the body if the balance is lost). The best of three trials will be counted.
APPENDIX C

LOCKHART AND MCPHERSON BADMINTON TEST*

PURPOSE

The test is designed to measure the present badminton playing ability and is used as a means of classification.

SEX AND AGE LEVEL

College women.

TEST ITEMS AND EQUIPMENT

The equipment consists of a badminton racket, shuttlecock, wall space 10 feet high and 10 feet in length, stop watch, score sheets, 1-inch net line marked on the wall 5 feet above and parallel to the floor, starting line drawn on the floor 6 1/2 feet from the base of the wall, and a restraining line marked on the floor 3 feet from the base wall and parallel to the starting line. (See Figure 1, page 38)

LEADERSHIP

One timer, (gives the signal, "Ready-Go" and "Stop"), one scorer, (counts the number of legal hits), and one recorder, (makes a record of the number of legal hits that are made).

DESCRIPTION OF TEST

The player taking the test stands behind the starting line holding the badminton racket in one hand and the shuttlecock in the other. On the signal "Ready-Go," the shuttlecock is served in a legal manner against the wall on or above the net line. The shuttlecock is played as many times as possible against the wall in 30 seconds. Three trials are given each player. Rest is allowed between trials. Before the first trial a practice period of 15 seconds is given.

Only shuttlecocks hitting on or above the net line are considered good; one point is counted for each such good hit.

After the shuttlecock has been served the player may move up to the restraining line if she wishes. If the restraining line is crossed, the hit is not counted but the shuttlecock is still in play. If the bird is missed or gets out of control, the player must retrieve it and continue by putting the shuttlecock back in play with a serve from behind the starting line.

SCORING

The scoring is the sum of the number of legal hits made on or above the backboard net line in the three trials.
Figure 1. Diagram of court markings for Lockhart and McPherson Badminton Test
APPENDIX D

CONTROL GROUP

BADMINTON CLASS SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>TUESDAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Organizational procedures</td>
</tr>
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<tr>
<th>THURSDAY</th>
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</thead>
<tbody>
<tr>
<td>Administered test to subjects &quot;Scott Motor Ability Test&quot;</td>
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<table>
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<tr>
<td>Administered test to subjects &quot;Lockhart and McPherson Badminton Test&quot;</td>
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<table>
<thead>
<tr>
<th>THURSDAY</th>
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<tbody>
<tr>
<td>Discussion of badminton</td>
</tr>
<tr>
<td>Values</td>
</tr>
<tr>
<td>History</td>
</tr>
<tr>
<td>Equipment</td>
</tr>
<tr>
<td>Present skills</td>
</tr>
<tr>
<td>Forehand grip</td>
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<tr>
<td>Short-serve--singles and doubles</td>
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<tr>
<td>Practice skills</td>
</tr>
<tr>
<td>Placement of short serve on courts</td>
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<table>
<thead>
<tr>
<th>TUESDAY</th>
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<tbody>
<tr>
<td>Review skills</td>
</tr>
<tr>
<td>Forehand grip</td>
</tr>
<tr>
<td>Short serve--singles and doubles</td>
</tr>
<tr>
<td>Present skills</td>
</tr>
<tr>
<td>Long high serve--singles and doubles</td>
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<tr>
<td>Practice skills</td>
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<tr>
<td>Placement of serves--short and long</td>
</tr>
</tbody>
</table>
Week 3

THURSDAY

Review skills
Grip
Serves--short and long
Present skills
Clears--forehand, backhand, underhand
Practice skills
Serves and rally with cleare

TUESDAY

Review skills
Serves
Clears
Present skills
Footwork for clears
Overhead drop
Practice skills
Serves and rally with cleare and drops

THURSDAY

Review skills
Serves
Clears
Drops
Footwork
Present skills
Game--parallel play
Scoring
Rules
Proper court position--serving and receiving
Practice skills
Play doubles--parallel play

TUESDAY

Review skills
All strokes
Practice skills
Parallel play
Week
5

THURSDAY

Present skills
Net shots--straight, cross-court, underhand at the net

Practice skills
Net shots with partners
Parallel play

TUESDAY

6

Review skills
Net shots--straight, cross-court, underhand

Practice skills
Parallel play
Singles--placement, positions, openings, strategy

THURSDAY

Present skills
Smash

Practice skills
Smash with partners on the courts
Singles

TUESDAY

7

Review skills
Smash shots
Net shots

Present skills
Game--up and back play, forecourt 1/3, backcourt 2/3

THURSDAY

Present skills
Drives (briefly)--forehand and backhand

Practice skills
Game--up and back play
Week 8

TUESDAY

Practice skills
Singles
Up and back game

THURSDAY

Practice skills
Singles--matches
Up and back game--matches

Week 9

THURSDAY

Review skills
All strokes
Present skills
Tournament play--select teams

Week 10

TUESDAY

Round Robin Tournament--doubles

THURSDAY

Round Robin Tournament--doubles

Week 11

TUESDAY

Round Robin Tournament--doubles

THURSDAY

Round Robin Tournament--singles

Week 12

TUESDAY

Round Robin Tournament--singles

THURSDAY

Round Robin Tournament--singles
THURSDAY
Badminton Performance Rating Chart
Subjects rated by three judges

TUESDAY
Administered test to subjects
"Lockhart and McPherson Badminton Test"

The control group spent ten weeks for a total of fifteen hours working on the basic skills of badminton in a game situation.
APPENDIX E

EXPERIMENTAL GROUP

BADMINTON CLASS SCHEDULE

Week
1

MONDAY

Organizational procedures

FRIDAY

Administered test to subjects
"Scott Motor Ability Test"

2

MONDAY

Administered test to subjects
"Lockhart and McPherson Badminton Test"

FRIDAY

Discussion of badminton
Values
History
Equipment
Floor markings
Divide class into squads--A, B, C, D, E, F
A--2  D--2
B--2  E--2
C--2  F--3
Present skills
Forehand grip
Short serve test--singles and doubles
Shuttle test
Practice skills
Ten short serves--Court II, III--A B C
Court V, VI--D E F
Shuttle test--as a group on all courts
MURDAY

Review skills
Five short serves--Court II, III--DE F
Court V, VI--ABC
Shuttle test--group

Present skills
Long high serve--singles and doubles

Practice skills
Ten long high serves--singles and doubles
Court II, III--ABC
Court V, VI--DEF

FRIDAY

Present skills
Wrist volley
Diagonal run
Clears--forehand, backhand

Practice skills
Diagonal run--group
Ten clears--Court II, III--ABC
Court V, VI--DEF

MONDAY

Practice skills
Squads rotate every eight minutes by the following way: Court I to II, II to III, III to IV, IV to V, V to VI, VI to I
Court I--A--Wrist volley, diagonal run
Court II--B--20 long high serve singles
10 short serve doubles and singles
Court III--C--20 long high serve doubles
10 short serve doubles and singles
Court IV--D--Shuttle run
Court V--E--20 clears--forehand and backhand
Court VI--F--20 clears--forehand and backhand
**FRIDAY**

Review skills
- Diagonal run—group

Present skills
- Clears—underhand

Practice skills
- Squads rotate every five minutes
  - Court I—A—Wrist volley
  - Court II—B—20 long high serve singles
    - 10 short serve doubles and singles
  - Court III—C—20 long high serve doubles
    - 10 short serve doubles and singles
  - Court IV—D—Shuttle run
  - Court V—E—20 clears—underhand
  - Court VI—F—20 clears—overhead

**MONDAY**

Practice skills
- Squads rotate every fifteen minutes—record scores
  - Court I—A—Wrist volley
  - Court II—B—20 long high serve singles
  - Court III—C—20 short serves
  - Court IV—D—Shuttle run
  - Court V—E—20 clears
  - Court VI—F—Diagonal run

**FRIDAY**

Practice skills
- Finish taking the tests

**MONDAY**

Present skills
- Overhead drops
- Net shots—straight, cross-court, underhand

Practice skills
- All courts—drop shots, 15 minutes
- All courts—net shots, 15 minutes
Week 6

FRIDAY

Review skills
Shuttle run—group
All courts—20 drop shots
All Courts—20 net shots

Present skills
Smash

Practice skills
Squads rotate every fifteen minutes—record scores—change squads
Court I—A—Wrist volley
Court II—E—20 short serves
Court III—C—20 long high serves doubles
Court IV—D—20 drop and net shots
Court V—E—20 smash shots
Court VI—F—20 clears

MONDAY

Practice skills
Finish taking the tests

FRIDAY

Practice skills
Clears and smash shots—Squads rotate every fifteen minutes
Court II—Clears
III—Clears—A B C
Court V—Smash—D E F
VI—Smash

MONDAY

Practice skills
Squads rotate every fifteen minutes—record scores—change squads
Court I—A—Wrist volley
Court II—E—20 long high serves singles
Court III—C—20 short serves
Court IV—D—20 drop and net shots
Court V—E—20 smash shots
Court VI—F—20 clears
Week 8

FRIDAY
Practice skills
Finish taking the tests

MONDAY
Present skills
Game—up and back play
Scoring
Rules
Proper court position—serving and receiving
Strategy
Practice skills
Up and back play

Week 9

MONDAY
Practice skills
Up and back play—doubles

FRIDAY
Practice skills
Up and back play—doubles

Week 10

MONDAY
Practice skills
Up and back play—doubles

FRIDAY
Practice skills
Up and back play—doubles

Week 11

MONDAY
Practice skills
Up and back play—doubles
Singles

FRIDAY
Practice skills
Singles—matches

Week 12

MONDAY
Practice skills
Singles—matches
The experimental group spent six and one-half weeks working on the basic skills of badminton by using skill tests and three and one-half weeks in a game situation for a total of fifteen hours.
APPENDIX F

EXPERIMENTAL GROUP SKILL TESTS IN BADMINTON*

I. SHUTTLE TEST

---

**EQUIPMENT**

One stop watch and one racket.

**FLOOR MARKINGS (See Figure 1)**

Use the side boundary lines (singles) and the center line of a regulation badminton court. Call one boundary line A and the opposite one C. Call the center line B.

**DESCRIPTION OF TEST**

The player to be tested shall stand facing the net on a spot marked X on the side boundary line (singles), called A, at the intersection of the back doubles service court line.

---

and the side boundary line (singles) with racket in hand. On signal, she uses sliding steps in a direction parallel to the back doubles service court line to the opposite side boundary line (singles), called 0, or runs and turns with a pivot (so the body will always be in position to return a shuttle sent to her forehand side) and returns to line A, moving back and forth between lines A and 0 for a period of fifteen seconds. The scorer, designated as Y in the diagram, shall stand anywhere between the short service line and the net with back toward net. Eight players may be tested at one time on four regulation badminton courts, a space approximately that of a regulation tennis court.

SCORING

Score one point for each crossing of lines B, C, and A. The score will be the total points of crossing for a period of fifteen seconds. (For ease in recording, count only the times lines A and 0 are crossed and credit one-half of a point if player has reached the center line, B, at the end of fifteen seconds.) Each player is to receive four trials of fifteen seconds each. Record all the trials. The final score is the total of the four trials. The scorer and player to be tested are to alternate, assuring each of a rest period between trials.

II. DIAGONAL TEST

Figure 2. Path of player in diagonal test
EQUIPMENT

One stop watch and one racket.

FLOOR MARKINGS

Use the corners formed by the side boundary lines (singles) of a regulation badminton court where they intersect with the short service line and with the back line of the doubles service court. Mark an X on the center line midway between the short service line and the back line of the doubles service court.

DESCRIPTION OF TEST

The player to be tested shall stand facing the net on a spot marked X on the center line midway between the short service line and the back doubles service court line with racket in hand. On signal, he runs diagonally right and forward to the intersection of the side boundary line (singles) and the short service line to the intersection with the opposite side boundary line (singles); turns with a pivot (so the body will always be in position to return a shuttle sent to his forehand side); runs diagonally across the starting mark, called X, to rear right to the intersection with the opposite side boundary line (singles) with the back doubles service court line; turns with a pivot turn and runs parallel to the back service line (doubles); turns with a pivot and runs diagonally to front right corner crossing starting mark as test is to be continued for a period of fifteen seconds. The scorer, designated as Y on the diagram, shall stand anywhere between the short service line and the net with back to net. Eight players may be tested at one time on four regulation badminton courts, a space approximately that of a regulation tennis court.

SCORING

Score one point for each corner and credit a point for each crossing of the starting mark, called X. The score will be the total points of corners and crossings of the starting mark for a period of fifteen seconds. Each player is to be given four trials of fifteen seconds each. Record all the trials. The final score is the total of the four trials. The scorer and player to be tested are to alternate, assuring each of a rest period between trials.
III. WRIST VOLLEY TEST

Figure 3. Floor markings for wrist volley test

EQUIPMENT

One stop watch, one tightly strung badminton racket, and one new badminton shuttle.

FLOOR MARKINGS

The target is an unobstructed wall of wood construction with a space 12-15 feet wide continuing upward from the floor toward the ceiling with a 1-inch net line marked on the wall 5 feet above and parallel to the floor. A restraining line 1 1/2 inches wide is to be drawn on the floor parallel to and six feet from the wall. Include the 1 1/2 inches of the restraining line in the six-foot distance from the wall.

DESCRIPTION OF TEST

The player to be tested shall stand behind the six-foot restraining line facing the wall with racket and shuttle in
hand. On signal, he serves the shuttle with an underhand serve against the wall and volleys it on or above the net line for a period of thirty seconds. Strokes made while the player is closer to the wall than the restraining line shall not count. The player may cross the restraining line to recover the shuttle, but he must return to a position behind the restraining line before putting shuttle into play again with an underhand serve. Any stroke may be used. Allow a five-minute practice period before testing. The test should be demonstrated before the students practice. The scorer shall stand behind the player being tested and slightly to her side. Twenty or more players can be tested at one time along four sides of a gymnasium.

SCORING

Score one point for each volley made on or above the net line. Putting the bird into motion with an underhand serve is not considered a volley. The score is the total number of times the shuttle is volleyed against the wall in thirty seconds. Each player is to receive four trials of thirty seconds each. Record all the trials. The final score is the total of the four trials. The scorer and player to be tested are to alternate, assuring each of a rest period between trials.

IV. SMASH TEST

![Figure 4. Floor markings for smash test](image)
EQUIPMENT

A clothesline rope stretched seven feet high parallel to and two feet from the net on the same side as the target. A tightly strung badminton racket and at least five new badminton shuttles for each player being tested.

FLOOR MARKINGS (see figure 4, page 54)

Use the short service line and the back doubles service line of a regulation badminton court, also the back service line (singles). Draw two lines 1 1/2 inches wide parallel to and one-third and two-thirds respectively of the distance between the short service line and the back doubles service line. The lines shall be painted with green paint to increase accuracy of scoring. Number the areas of the target five, four, three, two, and one consecutively beginning with the area nearest the net through to the back service line (singles).

DESCRIPTION OF TEST

The player to be tested, called X, shall stand anywhere behind the short service line on the court opposite the target and receive twenty shuttles (consecutively or divided into two groups of ten), which he will try to smash between the clothesline rope and the net, aiming for the area marked five on the target. The shuttles shall be served to the player being tested by a player, designated as Y in the diagram, standing anywhere in the service court area, who must serve the shuttle above the clothesline rope with enough force so that it will carry back to the short service line opposite the target. If the server hits the rope, it shall be a fault. He shall serve another. The player to be tested plays only good serves, but having once touched a shuttle with a racket, that shall be considered a trial. Twenty trials shall be given. If shuttle is smashed so as to contact body of the server, scorer shall estimate the area in which it would have fallen. A shuttle smashed into the net in such a way that it crosses it and falls into the target is counted, as is true in the game. Two practice trials shall be given. The test should be demonstrated and the scorers taught to distinguish between a drop shot and a smash. The server shall act as scorer and shall call out the score of each of the twenty trials to be recorded by an assistant. One assistant can record for two players being tested at one time on a regulation badminton court. (Target includes entire court for each girl).
The area between the net and the short service line counts five points, the remaining areas count four, three, two, and one respectively counting from the short service line to the back service line (singles). Shuttles landing on a line shall be given the value of the higher area.

**SCORING**

Score each shuttle in accordance with the area in which the cork portion of the shuttle first hits. Record all twenty trials, including those in which the shuttle is returned above the rope instead of between the rope and the net. The final score shall be the total value of the twenty trials. Students shall work in groups of two, one as server and one as the player being tested and then change positions at the end of the test.

**V. CLEAR TEST**

![Diagram of floor markings for clear test]

**EQUIPMENT**

A clothesline rope stretched across the court 14 feet from the net and parallel to it at a height of eight feet from the floor on the same side as the target. A tightly strung badminton racket and at least five new badminton shuttles for each player being tested.
FLOOR MARKINGS (see Figure 5, page 56)

Construct a line 1 1/2 inches wide two feet nearer the net than the rear service line and parallel to it. On the same side of the net construct a line two feet farther from the net than the rear service line (singles) and parallel to it. Measure from the exact center of the line. Extend lines from one outer alley line to the other outer line. The lines of the target shall be painted green to increase accuracy in scoring.

DESCRIPTION OF TEST

The player to be tested, called X, shall stand anywhere behind the short service line on the court opposite the target and receive twenty shuttles (consecutively or divided into two groups of ten), which he will try to send by means of a clear stroke above the rope so that the shuttle lands on the target. The shuttles shall be served to the player being tested by a player, designated as Y in the diagram, standing anywhere behind the short service line on the same side as the target, who must serve the shuttle with enough force that it will carry beyond the short service line opposite the target. Only shuttles played by the player being tested shall count as trials. A trial is to be considered a foul if the stroke is "carried" or "slung" and shall be repeated. Two practice trials shall be given. The instructor shall demonstrate a clear stroke using good form. The server shall act as scorer and shall call out the score of each of the twenty trials to be recorded by an assistant. One assistant can record for two players being tested at one time on a regulation badminton court. (Target includes entire court for each girl.) The area between the two rear lines of the regulation court counts five points, the space just behind it counts three points, and the space just in front of the two rear lines of the regulation court counts four points. Any shuttle going over the rope but failing to reach the target counts zero. Shuttles landing on a line shall be given the value of the higher area.

SCORING

Score each shuttle in accordance with the area in which the cork portion of the shuttle first hits. Record all twenty trials. The score shall be the total value of the twenty trials. Students shall work in groups of two, one as server and one as the player being tested and then change positions at end of the test.
VI. SHORT SERVE TEST--SINGLES AND DOUBLES

Figure 6. Floor markings for short serve test
singles and doubles

EQUIPMENT

A clothesline rope stretched 20 inches directly above the net and parallel to it attached to the same standards as the net. A tightly strung badminton racket and at least five new badminton shuttles for each player being tested.

FLOOR MARKINGS (see Figure 6)

Use the intersection of the short service line and the center line as a midpoint, describe a series of arcs 1 1/2 inches wide in the right service court at distances of 22 inches, 30 inches, 38 inches, and 46 inches from the midpoint, measurement including the width of the 1 1/2 inch line. Extend these arcs from the short service line to the center line. The lines of the target shall be painted green to increase accuracy in scoring.

DESCRIPTION OF TEST

The player to be tested, called X, shall stand anywhere in the service area diagonally opposite the target and serve twenty shuttles (consecutively or divided into two groups of ten), which he will try to send through the space between the rope and the net in such a manner that they land in the right service court for the doubles game. An illegal serve is considered a fault, and the trial must be repeated. The scorer,
designated as Y in the diagram, shall stand nearer the center of the left service court on the same side of the net with the target and facing the target. The corner of the target nearest the intersection of the service line and center line counts five points, the next space, four points, the next three points, then two points, and any shuttle landing off the target but in the service area for the doubles game counts one point. Any trial which fails to go between the rope and the net or which fails to land in the service court for the doubles game scores zero. Shuttles landing on a line shall be given the value of the higher area.

SCORING

Score each shuttle in accordance with the area in which the cork portion of the shuttle first hits. Record all twenty trials. The score shall be the total value of the twenty trials. Students shall work in groups of two, one as server and one as the player being tested and then change positions at end of the test.

VII. LONG HIGH SERVE TEST--SINGLES AND DOUBLES

Figure 7. Floor markings for long high serve test. Right court for long high serve doubles
Left court for long high serve singles
EQUIPMENT

A clothesline rope stretched across the court 14 feet from the net and parallel to it, at a height of 8 feet from the floor.

FLOOR MARKINGS

Using the intersection of the long service line and the left side boundary line for singles as a midpoint, describe a series of arcs in the left service court at distances of 22 inches, 30 inches, 38 inches, and 46 inches from the midpoint, the measurement including the width of the 2-inch line. Extend these arcs from the long service line to the side line, as indicated in the diagram. (see Figure 7, page 59). The lines are painted green to increase accuracy in scoring.

DESCRIPTION OF TEST

The player being tested stands any place in the service area diagonally opposite the target, and serves twenty times, attempting to send the shuttle over the rope in such a manner that it will land in the target at the rear of the left court. The corner of the target nearest the intersection of the service line and the side line counts five points, the next space four points, the next three, then two, and any shuttle (over the rope) in the service area outside the target counts one point.

SCORING

No score is given for any trial which fails to go over the 8-foot rope or which fails to land in the service court. Any shuttle landing within an area or on the line surrounding an area is scored as shown in the diagram. Any shuttle landing on a line dividing two scoring areas receives the score of the higher area. The score for the entire test is the sum of twenty trials. It is considered a foul and the trial is repeated if the serve is illegal.
VIII. NET SHOTS*

EQUIPMENT

A clothesline rope stretched 20 inches directly above the net and parallel to it attached to the same standards as the net. A tightly strung badminton racket and badminton shuttles.

FLOOR MARKINGS (see Figure 8)

Use the center line of a regulation badminton court and extend a line two feet back from the center line across the court.

DESCRIPTION OF TEST

The player to be tested, called X, shall stand anywhere in front of the short service line on the court opposite the target and receive twenty shuttles (consecutively or divided into two groups of ten), which he will try to send by means of a net stroke below the rope so that the shuttle lands on the target. The shuttles shall be served to the player being

*Tests eight and nine were made and administered by the author.
tested by a player, designated as Y in the diagram, standing anywhere behind the short service line on the same side as the target, who must serve the shuttle so that the player taking the test may attempt a net shot without moving behind the short service line. Only shuttles played by the player being tested shall count as trials. The server shall act as scorer and shall call out the score of each of the twenty trials to be recorded by an assistant. The area between the center line of a regulation court and two feet back shall count two points, the space just behind it and back to the short service line shall count one point. Any shuttle going above the rope or failing to fall within the target counts zero. Shutters landing on a line shall be given the value of the higher area.

**SCORING**

Score each shuttle in accordance with the area in which the cork portion of the shuttle first hit. Record all twenty trials. The score shall be the total value of the twenty trials. Students shall work in groups of two, one as server and one as the player being tested and then change positions at end of the test.

**IX. DROP SHOTS**

![Figure 9. Floor markings for drop shots](image_url)
EQUIPMENT

A tightly strung badminton racket and badminton shuttles.

FLOOR MARKINGS (see Figure 9, page 62)

Use the center line of a regulation badminton court and extend a line two feet back from the center line across the court.

DESCRIPTION OF TEST

The player to be tested, called X, shall stand anywhere behind the short service line on the court opposite the target and receive twenty shuttles (consecutively or divided into two groups of ten), which he will try to send by means of a drop stroke across the net so that the shuttle lands on the target. The shuttles shall be served to the player being tested by a player, designated as Y in the diagram, standing anywhere behind the short service line on the same side as the target, who must serve the shuttle with enough force that it will carry beyond the short service line opposite the target. Only shuttles played by the player being tested shall count as trials. The server shall act as scorer and shall call out the score of each of the twenty trials to be recorded by an assistant. The area between the center line of a regulation badminton court and two feet back shall count two points, the space just behind it and back to the short service line shall count one point. Any shuttle going across the net but failing to fall within the target counts zero. Shuttles landing on a line shall be given the value of the higher area.

SCORING

Score each shuttle in accordance with the area in which the cork portion of the shuttle first hit. Record all twenty trials. The score shall be the total value of the twenty trials. Students shall work in groups of two, one as server and one as the player being tested and then change positions at end of the test.
EXPERIMENTAL GROUP FLOOR PATTERN

COURT I

WALL

NET LINE

RESTRAINING LINE

USE OF THE COURT

Court I was used to practice the following skills (a) shuttle run, (b) diagonal run, (c) net shots, (d) drop shots, and (e) wrist volley at the beginning of the study. After all skills were practiced Court I was used only for the wrist volley and diagonal run.
COURT II

USE OF THE COURT

Court II was used to practice the following skills (a) shuttle run, (b) diagonal run, (c) net shots, (d) drop shots, (e) serves, (f) clears, and (g) smash shots at the beginning of the study. After all skills were practiced Court II was used only for the long high serve in singles and the short serve for doubles and singles.

COURT III

USE OF THE COURT

Court III was used to practice the following skills (a) shuttle run, (b) diagonal run, (c) net shots, (d) drop shots, (e) serves, (f) clears, and (g) smash shots at the beginning of the study. After all skills were practiced Court III was used only for the long high serve in doubles and the short serve for doubles and singles.
USE OF THE COURT

Court IV was used to practice the following skills (a) shuttle run, (b) diagonal run, (c) net shots, and (d) drop shots at the beginning of the study. After all skills were practiced Court IV was used only for the net shots, drop shots, and shuttle run.

USE OF THE COURT

Court V was used to practice the following skills (a) shuttle run, (b) diagonal run, (c) net shots, (d) drop shots, (e) serves, (f) clears, and (g) smash shots at the beginning of the study. After all skills were practiced Court V was used only for the clears.
USE OF THE COURT

Court VI was used to practice the following skills (a) shuttle run, (b) diagonal run, (c) net shots, (d) drop shots, (e) serves, (f) clears, and (g) smash shots at the beginning of the study. After all skills were practiced Court VI was used only for the smash shots.
### APPENDIX G

#### BADMINTON PERFORMANCE RATING CHART

<table>
<thead>
<tr>
<th>RATING SCALE</th>
<th>5--SUPERIOR</th>
<th>4--GOOD</th>
<th>3--AVERAGE</th>
<th>2--FAIR</th>
<th>1--POOR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grip and Accuracy</strong></td>
<td><strong>Comments</strong></td>
<td><strong>Stroke Execution</strong></td>
<td><strong>Comments</strong></td>
<td><strong>Footwork, Timing, Court Position,</strong></td>
<td><strong>Anticipation</strong></td>
</tr>
<tr>
<td>1. <strong>Grip</strong></td>
<td></td>
<td>3. <strong>BACKSWING</strong></td>
<td></td>
<td>8. <strong>Preparing to Receive</strong></td>
<td></td>
</tr>
<tr>
<td>Relaxed grip—spread fingers; index finger down.</td>
<td></td>
<td>Backswing taken from waist</td>
<td></td>
<td>Active position of readiness</td>
<td></td>
</tr>
<tr>
<td>Forefinger &amp; thumb control</td>
<td></td>
<td>Lead backhand with racket head</td>
<td></td>
<td>Weight equally distributed</td>
<td></td>
</tr>
<tr>
<td>Little finger on butt</td>
<td></td>
<td>Forward swing with wrist</td>
<td></td>
<td>Plays proper court position</td>
<td></td>
</tr>
<tr>
<td>Hand shake grip</td>
<td></td>
<td>Take backswing before bird arrives</td>
<td></td>
<td>Racket in front of body at waist level</td>
<td>RATING___</td>
</tr>
<tr>
<td>RATING___</td>
<td>RATING___</td>
<td>RATING___</td>
<td>RATING___</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. <strong>Accuracy Placement</strong></td>
<td></td>
<td>4. <strong>BIRD CONTACT</strong></td>
<td></td>
<td>9. <strong>Getting into Position</strong></td>
<td></td>
</tr>
<tr>
<td>Bird hit to corners</td>
<td></td>
<td>Bird met over the forward foot</td>
<td></td>
<td>Pivots and moves toward the bird</td>
<td></td>
</tr>
<tr>
<td>Consistently hits in bounds</td>
<td></td>
<td>Force given with the wrist snap</td>
<td></td>
<td>Uses gliding steps</td>
<td>RATING___</td>
</tr>
<tr>
<td>Makes openings</td>
<td>RATING___</td>
<td>RATING___</td>
<td>RATING___</td>
<td>RATING___</td>
<td></td>
</tr>
<tr>
<td>5. <strong>Follow-through</strong></td>
<td></td>
<td>10. <strong>Footwork</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full follow-through (except net &amp; drop shots)</td>
<td></td>
<td>Has flexible base</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swing continuous in direction of shot</td>
<td></td>
<td>Weight on balls of feet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RATING___</td>
<td></td>
<td>Feet set first, then hits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RATING___</td>
<td>RATING___</td>
<td>RATING___</td>
<td>RATING___</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## BADMINTON PERFORMANCE RATING CHART

### GRIP AND ACCURACY

<table>
<thead>
<tr>
<th>Comments</th>
<th>STROKE EXECUTION Comments</th>
<th>FOOTWORK, TIMING, COURT POSITION, ANTICIPATION Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### GENERAL OVER-ALL EVALUATION

<table>
<thead>
<tr>
<th>A single rating not to be included in the 10 divisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong, proper, &amp; smooth strokes</td>
</tr>
<tr>
<td>Well-coordinated effort</td>
</tr>
<tr>
<td>Alert position of body</td>
</tr>
<tr>
<td>Consistent in placement of bird</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RATING</th>
</tr>
</thead>
</table>

### 6. WEIGHT SHIFT

- Body at right angles to net
- Weight transferred from rear to front foot
- Knees and hips flexed

<table>
<thead>
<tr>
<th>RATING</th>
</tr>
</thead>
</table>

### 7. SERVICE

<table>
<thead>
<tr>
<th>Grip</th>
<th>Stance</th>
<th>Impact &amp; follow-through</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Flight of bird</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Variety of shots-long, short, right, left</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RATING</th>
<th>TOTAL RATING</th>
</tr>
</thead>
</table>

**DATE**

**JUDGE**

**STUDENT**

**TOTAL RATING**
BADMINTON PERFORMANCE RATING SCALE

5 S.---SUPERIOR

1. Very alert assumption of proper body position; eye on bird
2. Strong, proper, and smooth mechanics; backswing, point of contact, follow-through, grip
3. Well-coordinated effort with ease in weight shift and body pivot
4. Always accurate and consistent in placement of the bird

4 S.---GOOD

1. Usually assumes proper body position
2. Slight weakness in proper stroke mechanics; backswing, point of contact, follow-through, grip
3. Good coordination with proper weight shift, and body pivot
4. Usually plays to the corners, in bounds, and makes openings

3 S.---AVERAGE

1. Occasionally assumes satisfactory body position
2. Satisfactory stroke mechanics with some weakness in the backswing, point of contact, follow-through, grip
3. Satisfactory coordination with weight shift, and some body pivot
4. Sometimes successful in playing the corners, and in bounds, occasionally makes openings

2 S.---FAIR

1. Hesitant in foot work and in assuming proper body position; little regard for the bird
2. Considerable weakness shown in the stroke mechanics; backswing, point of contact, follow-through, grip
3. Deficient coordination; inadequate weight shift and body pivot
4. Seldom plays to the corners, consistently hits out-of-bounds and quite weak in making openings

1 S.---POOR

1. Improper footwork and position; eye not on bird
2. Unsatisfactory stroke mechanics; inadequate backswing, point of contact, follow-through, grip
3. Lacking coordination; no sign of weight shift and proper body pivot
4. Never plays the corners, no sign of making openings, hits out-of-bounds
## APPENDIX H

### RESULTS OF THE SCOTT MOTOR ABILITY TEST

<table>
<thead>
<tr>
<th>Name</th>
<th>Obstacle race</th>
<th>Standing broad jump</th>
<th>Basketball throw</th>
<th>T-score*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ollek</td>
<td>20.2</td>
<td>6' 5&quot;</td>
<td>52.1</td>
<td>204</td>
</tr>
<tr>
<td>Mann</td>
<td>20.2</td>
<td>5' 8&quot;</td>
<td>62.1</td>
<td>201</td>
</tr>
<tr>
<td>Keyer</td>
<td>21.9</td>
<td>6' 0&quot;</td>
<td>50.1</td>
<td>188</td>
</tr>
<tr>
<td>Davis</td>
<td>20.6</td>
<td>5' 8&quot;</td>
<td>45.1</td>
<td>184</td>
</tr>
<tr>
<td>Hartman</td>
<td>20.2</td>
<td>5' 9&quot;</td>
<td>39.1</td>
<td>182</td>
</tr>
<tr>
<td>Anderson</td>
<td>24.4</td>
<td>5' 0&quot;</td>
<td>59.1</td>
<td>170</td>
</tr>
<tr>
<td>Franz</td>
<td>22.2</td>
<td>5' 9&quot;</td>
<td>31.1</td>
<td>162</td>
</tr>
<tr>
<td>Houk</td>
<td>22.1</td>
<td>5' 4&quot;</td>
<td>32.1</td>
<td>157</td>
</tr>
<tr>
<td>Snider</td>
<td>22.1</td>
<td>5' 0&quot;</td>
<td>33.1</td>
<td>153</td>
</tr>
<tr>
<td>Butcherworth</td>
<td>24.8</td>
<td>4' 10&quot;</td>
<td>36.1</td>
<td>145</td>
</tr>
<tr>
<td>Bryan</td>
<td>26.8</td>
<td>4' 2&quot;</td>
<td>29.1</td>
<td>117</td>
</tr>
<tr>
<td>Hendrickson</td>
<td>25.4</td>
<td>3' 10&quot;</td>
<td>26.1</td>
<td>115</td>
</tr>
<tr>
<td>Carter</td>
<td>29.0</td>
<td>3' 8&quot;</td>
<td>31.1</td>
<td>108</td>
</tr>
<tr>
<td>Browlee</td>
<td>28.1</td>
<td>3' 10&quot;</td>
<td>21.1</td>
<td>96</td>
</tr>
</tbody>
</table>

**Total** 2182

**Mean** 155.86

### II. EXPERIMENTAL GROUP

<table>
<thead>
<tr>
<th>Name</th>
<th>Obstacle race</th>
<th>Standing broad jump</th>
<th>Basketball throw</th>
<th>T-score*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hamman</td>
<td>21.0</td>
<td>6' 9&quot;</td>
<td>54.1</td>
<td>204</td>
</tr>
<tr>
<td>McInty</td>
<td>20.2</td>
<td>5' 7&quot;</td>
<td>54.1</td>
<td>193</td>
</tr>
<tr>
<td>Totten</td>
<td>21.0</td>
<td>5' 7&quot;</td>
<td>55.1</td>
<td>188</td>
</tr>
<tr>
<td>Chilf</td>
<td>21.6</td>
<td>5' 2&quot;</td>
<td>62.1</td>
<td>185</td>
</tr>
<tr>
<td>Lampe</td>
<td>24.5</td>
<td>4' 11&quot;</td>
<td>68.1</td>
<td>174</td>
</tr>
<tr>
<td>Miner</td>
<td>21.6</td>
<td>4' 11&quot;</td>
<td>42.1</td>
<td>165</td>
</tr>
<tr>
<td>Naylor</td>
<td>24.5</td>
<td>5' 8&quot;</td>
<td>44.1</td>
<td>165</td>
</tr>
<tr>
<td>Armstrong</td>
<td>23.2</td>
<td>4' 10&quot;</td>
<td>47.1</td>
<td>162</td>
</tr>
<tr>
<td>Armbrust</td>
<td>25.5</td>
<td>4' 2&quot;</td>
<td>43.1</td>
<td>140</td>
</tr>
<tr>
<td>Fried</td>
<td>26.9</td>
<td>4' 7&quot;</td>
<td>41.1</td>
<td>138</td>
</tr>
<tr>
<td>Wener</td>
<td>28.3</td>
<td>4' 3&quot;</td>
<td>37.1</td>
<td>123</td>
</tr>
<tr>
<td>Blocker</td>
<td>28.8</td>
<td>4' 6&quot;</td>
<td>32.1</td>
<td>121</td>
</tr>
<tr>
<td>Dale</td>
<td>27.4</td>
<td>4' 2&quot;</td>
<td>30.1</td>
<td>118</td>
</tr>
</tbody>
</table>

**Total** 2076

**Mean** 159.59

*The total mean scores represent the sum of the raw scores of the obstacle race, basketball throw, and standing broad jump after they were converted into T-scores.*
## APPENDIX I

### RESULTS OF THE INITIAL, FINAL AND NET GAIN OF THE LOCKHART AND MCPHERSON BADMINTON TEST

<table>
<thead>
<tr>
<th>Name</th>
<th>Initial test</th>
<th>Final test</th>
<th>Net gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anderson</td>
<td>45</td>
<td>52</td>
<td>7</td>
</tr>
<tr>
<td>Browleewe</td>
<td>14</td>
<td>27</td>
<td>13</td>
</tr>
<tr>
<td>Bryan</td>
<td>38</td>
<td>76</td>
<td>38</td>
</tr>
<tr>
<td>Butterworth</td>
<td>47</td>
<td>79</td>
<td>32</td>
</tr>
<tr>
<td>Carter</td>
<td>44</td>
<td>92</td>
<td>48</td>
</tr>
<tr>
<td>Davis</td>
<td>46</td>
<td>73</td>
<td>27</td>
</tr>
<tr>
<td>Franz</td>
<td>40</td>
<td>65</td>
<td>25</td>
</tr>
<tr>
<td>Hartman</td>
<td>38</td>
<td>94</td>
<td>56</td>
</tr>
<tr>
<td>Hendrickson</td>
<td>49</td>
<td>64</td>
<td>15</td>
</tr>
<tr>
<td>Houk</td>
<td>22</td>
<td>89</td>
<td>67</td>
</tr>
<tr>
<td>Hanz</td>
<td>36</td>
<td>115</td>
<td>77</td>
</tr>
<tr>
<td>Meyer</td>
<td>36</td>
<td>78</td>
<td>42</td>
</tr>
<tr>
<td>Olliek</td>
<td>68</td>
<td>95</td>
<td>27</td>
</tr>
<tr>
<td>Srader</td>
<td>41</td>
<td>60</td>
<td>19</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>566</strong></td>
<td><strong>1059</strong></td>
<td><strong>493</strong></td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td><strong>40.43</strong></td>
<td><strong>75.64</strong></td>
<td><strong>35.21</strong></td>
</tr>
</tbody>
</table>

### II. EXPERIMENTAL GROUP

<table>
<thead>
<tr>
<th>Name</th>
<th>Initial test</th>
<th>Final test</th>
<th>Net gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armbrust</td>
<td>46</td>
<td>62</td>
<td>16</td>
</tr>
<tr>
<td>Armstrong</td>
<td>58</td>
<td>79</td>
<td>21</td>
</tr>
<tr>
<td>Blocker</td>
<td>21</td>
<td>47</td>
<td>26</td>
</tr>
<tr>
<td>Childs</td>
<td>74</td>
<td>93</td>
<td>19</td>
</tr>
<tr>
<td>Dale</td>
<td>42</td>
<td>90</td>
<td>48</td>
</tr>
<tr>
<td>Fried</td>
<td>49</td>
<td>67</td>
<td>18</td>
</tr>
<tr>
<td>Hamman</td>
<td>27</td>
<td>55</td>
<td>28</td>
</tr>
<tr>
<td>Lampes</td>
<td>51</td>
<td>61</td>
<td>10</td>
</tr>
<tr>
<td>McNitt</td>
<td>52</td>
<td>88</td>
<td>35</td>
</tr>
<tr>
<td>Miner</td>
<td>88</td>
<td>108</td>
<td>20</td>
</tr>
<tr>
<td>Maylor</td>
<td>44</td>
<td>63</td>
<td>19</td>
</tr>
<tr>
<td>Totten</td>
<td>49</td>
<td>100</td>
<td>51</td>
</tr>
<tr>
<td>Wenger</td>
<td>35</td>
<td>44</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>637</strong></td>
<td><strong>957</strong></td>
<td><strong>320</strong></td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td><strong>49.00</strong></td>
<td><strong>75.62</strong></td>
<td><strong>24.62</strong></td>
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</tbody>
</table>
# APPENDIX J

## RESULTS OF THE JUDGES' RATINGS

<table>
<thead>
<tr>
<th>Control Group</th>
<th>Experimental Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name</strong></td>
<td><strong>Total Rating</strong></td>
</tr>
<tr>
<td>Davis</td>
<td>108</td>
</tr>
<tr>
<td>Sroder</td>
<td>89</td>
</tr>
<tr>
<td>Mens</td>
<td>86</td>
</tr>
<tr>
<td>Olleke</td>
<td>85</td>
</tr>
<tr>
<td>Meyer</td>
<td>84</td>
</tr>
<tr>
<td>Hartman</td>
<td>83</td>
</tr>
<tr>
<td>Franz</td>
<td>81</td>
</tr>
<tr>
<td>Butterworth</td>
<td>76</td>
</tr>
<tr>
<td>Hoek</td>
<td>69</td>
</tr>
<tr>
<td>Carter</td>
<td>62</td>
</tr>
<tr>
<td>Hendrickson</td>
<td>57</td>
</tr>
<tr>
<td>Anderson</td>
<td>56</td>
</tr>
<tr>
<td>Bryan</td>
<td>51</td>
</tr>
<tr>
<td>Browleeve</td>
<td>46</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1033</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>73.71</td>
</tr>
</tbody>
</table>

*The scores represent the sum total of the ratings of three judges for each student.*