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A NORMATIVE STUDY OF THE AAHPER YOUTH FITNESS TEST FOR GIRLS  
IN GRADES 7-10 IN THE STATE OF SOUTH DAKOTA

BY

JUDY G. BUSCH

A thesis submitted  
in partial fulfillment of the requirements for the  
degree Master of Science, Major in Physical  
Education, South Dakota State University

1969

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A NORMATIVE STUDY OF THE AAHPER YOUTH FITNESS TEST FOR GIRLS  
IN GRADES 7-10 IN THE STATE OF SOUTH DAKOTA

This thesis is approved as a creditable and independent investigation by the candidate for the degree, Master of Science, and is acceptable as meeting the thesis requirements for this degree, but without implying that the conclusions reached by the candidate are necessarily the conclusions of the major department.

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Thesis Adviser

U Date

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U Head, Health, Physical  
Education and Recreation  
Department

U Date

## ACKNOWLEDGMENTS

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JGB

A NORMATIVE STUDY OF THE AAHPER YOUTH FITNESS TEST FOR GIRLS  
IN GRADES 7-10 IN THE STATE OF SOUTH DAKOTA

Abstract

JUDY G. BUSCH

The purpose of this study was to establish norms for the AAHPER Youth Fitness Test for South Dakota girls in grades seven through ten and to compare their scores with those of national girls.

One school was selected to represent each region or section of the South Dakota High School Activities' Association. The number selected from each school was in proportion to the school's enrollment.

The AAHPER Youth Fitness Test was administered to one thousand South Dakota girls in grades seven through ten. Norms were established by computing every fifth percentile. The scores of South Dakota girls were compared with the scores of national girls, using age only. The medians of South Dakota girls were then compared to the medians of the national girls on each test item.

It was found that the medians for South Dakota girls were higher than the medians for national girls on all items except for the flexed-arm hang.

The scores of South Dakota girls tended to show improvement as age increased whereas the scores for national girls tended to level off or drop.

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## CHAPTER I

### INTRODUCTION

#### I. THE PROBLEM

Statement of the problem. The purpose of this study was to establish the American Association for Health, Physical Education and Recreation Youth Fitness Test norms for South Dakota girls in grades seven through ten and to compare these norms with the American Association for Health, Physical Education and Recreation Youth Fitness Test norms.\*

Significance of the study. During a Presidential message to the schools on physical fitness of American youth, President John F. Kennedy made the following statement: "The level of physical, mental, moral, and spiritual fitness of every American citizen must be our constant concern."<sup>1</sup>

Many physical educators share the opinion of President Kennedy that all pupils should be assured of at least a minimum amount of physical fitness as a result of a physical education program. Clarke writes that, in order to determine whether this objective is being met,

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\*A similar study was concurrently completed for boys; Glenn L. Rasmussen, "A Normative Study of the AAHPER Youth Fitness Test for Boys in Grades 7-10 in the State of South Dakota" (unpublished Master's thesis, South Dakota State University, Brookings, 1969), pp. 1-67.

<sup>1</sup>President's Council on Youth Fitness, "A Presidential Message to the Schools on Physical Fitness of Youth," Youth Physical Fitness (Washington: Government Printing Office, 1961), p. 3.

definite steps should be taken to obtain the physical fitness status of each pupil in school. Only through measuring the program and teacher efficiency are the physical educators able to effectively improve the program, which in turn improves the physical status of the individual.<sup>2</sup>

In 1965, Hunsicker conducted a study with the purpose of revising the American Association for Health, Physical Education and Recreation Youth Fitness Test norms which had been devised in 1957-58. In his 1965 study, Hunsicker did not use any South Dakota schools as a part of his sample. It was felt, therefore, that a similar study should be conducted where norms are established specifically for the state of South Dakota and that these norms be compared with the national norms. It was to this end that the present study was conducted.

## II. LIMITATIONS

1. The American Association for Health, Physical Education and Recreation Youth Fitness Test was administered to only one thousand girls in grades seven through ten in South Dakota.
2. The investigator did not administer the fitness test to the subjects.
3. Due to varied teacher qualifications, the administration of the test items might have varied from school to school even though exact instructions were given to each teacher.

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<sup>2</sup>H. Harrison Clarke, Application of Measurement to Health and Physical Education (Englewood Cliffs: Prentice Hall, Inc., 1967), p. 54.

4. Inadequate facilities and lack of time might have altered test administration in some schools.
5. The test was administered on only one occasion in each school.

### III. DEFINITION OF TERMS

AAHPER. The American Association for Health, Physical Education and Recreation.

AAHPER Youth Fitness Test. The AAHPER Youth Fitness Test is a battery of seven test items designed to give a measure of physical fitness for both boys and girls in grades five through twelve. The seven test items are pull-up (with flexed-arm hang for girls) for judging arm and shoulder girdle strength; sit-up for judging efficiency of abdominal and hip flexor muscles; shuttle run for judging speed and change of direction; standing broad jump for judging explosive muscle power of leg extensors; 50-yard dash for judging speed; softball throw for distance for judging skill and coordination; and 600-yard run-walk for judging cardiovascular efficiency.<sup>3</sup>

Norm. A norm is a standard to which an obtained score may be compared.<sup>4</sup>

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<sup>3</sup>American Association for Health, Physical Education and Recreation Youth Fitness Test Manual (revised edition, Department of the National Education Association, 1965), p. 7.

<sup>4</sup>Donald K. Mathews, Measurement in Physical Education (Philadelphia, London, Toronto: W. B. Saunders Company, 1968), p. 27.

### IV. HYPOTHESIS

There is no difference in the physical fitness of South Dakota girls in grades seven through ten and that of other national girls of the same age.

## CHAPTER II

### REVIEW OF THE RELATED LITERATURE

Much has been written in regard to the physical fitness of American youth. However, only a review of the formulation of the AAHPER test and studies completed in the state of South Dakota are reported in this chapter.

Carl Troester, executive secretary of the AAHPER, states that most educators are convinced of the importance of physical fitness. He further states that this concern is not recent; generation after generation has been complaining about the poor fitness of its youth. "However," Troester states, "the present emphasis on fitness in peacetime is unusual."<sup>5</sup>

Kraus and Hirschland in reviewing World War II statistics found that during this period forty per cent of the young men that took medical physicals to enter the service were found unfit for military service. These statistics brought about a series of studies one of which was conducted by Kraus and Hirschland. They compared the physical fitness of American children with that of European children by using a test of minimum physical fitness. The results of the Kraus-Weber Test of Minimal Fitness were published in 1953, and showed that the average

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<sup>5</sup>American Association for Health, Physical Education and Recreation Youth Fitness Test Manual, Department of the National Education Association, 1961, p. iv.

American school child was lacking in minimal muscular requirements and that American children were physically unfit compared with European children.<sup>6</sup>

#### I. DEVELOPMENT OF THE AAHPER YOUTH FITNESS TEST<sup>7</sup>

As a result of Kraus's study, as well as other events, President Dwight D. Eisenhower in 1956, called a national conference to consider the fitness of American youth. It was from this conference that the AAHPER Youth Fitness Project began.

The project began in 1957 with a conference being called by the AAHPER. The purpose of the project was to establish a valid physical fitness test, which could be easily administered, and to establish national norms for the test. The items in the test were selected because they were reasonably familiar to most if not all physical educators, because they required little or no equipment, since they measured different components of fitness, and because they could be administered to both boys and girls in the entire age range of grades five through twelve with the one exception of the pull-up. The correlations among the seven test items were found to be low; therefore, all seven test items were selected to make up the AAHPER Youth Fitness Test.

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<sup>6</sup>Hans Kraus and Ruth P. Hirschland, "Muscular Fitness and Health," Journal of Health, Physical Education and Recreation, 24:17-19, December, 1953.

<sup>7</sup>Unless otherwise noted, the information referred to in this section comes from Paul A. Hunsicker and Guy G. Reiff, "A Survey and Comparison of Youth Fitness" (a Cooperative Research Project No. 2418, United States Office of Education, 1958-1965), pp. 1-174.



The seven items selected were pull-ups (modified pull-ups for girls) for measuring arm and shoulder girdle strength; sit-ups for measuring efficiency of abdominal and hip flexor muscles; shuttle run for measuring speed and change of direction; standing broad jump for measuring explosive muscle power of leg extensors; 50-yard dash for measuring speed; softball throw for distance for measuring skill and coordination; and 600-yard run-walk for measuring cardiovascular efficiency.

At the 1957 American Association for Health, Physical Education and Recreation conference, Hunsicker was appointed as director of the project to test the American youth on the newly developed AAHPER Test and to develop national norms for the fitness test.

A representative sampling was selected by the Survey Research Center of the University of Michigan. The sampling was based on home-room units in grades five through twelve so that both those taking physical education and those excused from it would be included. Drawing of the sample schools, making the initial contact requesting the school's cooperation, and deciding which students in cooperating schools would be subjects were all done by the Survey Research Center. Hunsicker distributed directions for administering the test and demonstrated the test items to the professional people in various sections of the country who assumed the responsibility for supervising the test administration in their areas.

Scores for 8,500 boys and girls in grades five through twelve were sent to the University of Michigan where they were transcribed on worksheets and punched onto IBM cards. Percentile score tables were

determined for each of the tests, based both on age alone and on the Neilson-Cozens Classification Index. All data were collected and analyzed during the school year 1957-58.

In 1963, Hunsicker undertook a second national survey to bring the norms up to date to determine whether increased emphasis on physical fitness since 1958 had helped to increase the fitness levels of the American youth. The testing took place during the school years 1963-1965. The test items administered during the second survey were identical to those given in 1957-58 with one exception. The flexed-arm hang was substituted for the modified pull-up for girls because it gave a more efficient and reliable measure for the variable tested. The Survey Research Center at the University of Michigan again drew the sample of 9,200 boys and girls.

The new norms indicated that boys and girls, ages ten to seventeen, were more fit in 1964-65 as measured by the AAHPER Youth Fitness Test, than they were in 1957-58 when the norms were first established. The norms for all items were raised.

## II. COMPARATIVE STUDIES UTILIZING THE AAHPER YOUTH FITNESS TEST

In 1962 Lilevjen and Schlekeway conducted a study utilizing the AAHPER Youth Fitness Test to compare the physical fitness of 314 male students of Watertown, South Dakota, Junior High School with national norms. The subjects were classified according to the Neilson-Cozens Classification Index. The testing was done by the junior high physical education instructors under the supervision of the authors. An initial test at the start of the school term and a final test at the end of the

school term were administered and the percentile ranks of all students on each of the seven items were averaged. The ranks were arranged in two frequency distributions and the means for the two tests were determined. By the use of the  $t$  test it was determined that there was a significant gain in physical fitness from the initial test to the final test.

On the initial test, according to test item average, all classifications fell well above the fiftieth percentile of the national norms in all test items with the exception of the 50-yard dash. On the final test, according to test item average, all classifications fell well above the fiftieth percentile of the national norms in all test items.<sup>8</sup>

Howlin conducted a study with the purpose of comparing the physical fitness of selected schools in Sioux Falls, South Dakota, with national fitness norms. Each school's test scores were compared with the other Sioux Falls schools to see which school had the highest scores. Then all of the physical test scores from all of the schools were compared as a whole with national norms. Charts were used to show the comparison with national norms. The girls fell below the national average in three events: the shuttle run, the broad jump, and the

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<sup>8</sup>Clar Lilevjen and Eugene Schlekeway, "The Effects of a Physical Education Program of 150 Minutes Per Week at Watertown, South Dakota, on Physical Fitness as Compared to the National Norms Established by the AAHPER Fitness Test" (unpublished Research Report, South Dakota State University, Brookings, 1962), pp. 1-43.

softball throw. The boys fell below the average in two events: the shuttle run and the broad jump.<sup>9</sup>

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<sup>9</sup>James Howlin, "Comparing Physical Fitness in Selected Areas in Sioux Falls, South Dakota, with the National Norms and La Port Score Card" (unpublished Master's thesis, South Dakota State University, Brookings, 1959), pp. 1-86.

## CHAPTER III

### METHODS AND PROCEDURES

#### I. SOURCE OF SUBJECTS

The AAHPER Youth Fitness Test was administered to one thousand girls in grades seven through ten in South Dakota. These one thousand students were selected by the stratified random-sampling technique. The following procedures were used:

1. In the state of South Dakota, all schools are classified as either an "A" or "B" school, depending upon the size of the school. The total enrollments of the Class "A" and Class "B" schools are approximately equal; therefore, 50 per cent of the sample was randomly selected from either class.
2. The schools are also divided into thirty-two regions in the Class "B" schools and eight sections in the Class "A" schools. One school was selected to represent each Class "B" region and one to represent each Class "A" section by the pulling-out-of-the-hat technique.
3. The number of subjects tested from each selected school depended upon the size of the enrollment in that particular region or section to be represented proportionately.

Appendix A illustrates the breakdown of the sample into the Class "A" and the Class "B" schools and a further breakdown into regions and sections and the number of subjects from each.

Appendix B lists the schools which participated in the study.

## II. PROCEDURE FOR COLLECTING THE DATA

A preliminary letter was sent to the principal of each selected school introducing the study and asking for their cooperation. A cover letter was written by Richard Nankivel, specialist of Health, Physical Education and Recreation for the State Department of Public Instruction. Copies of the cooperative letters of Rasmussen and this investigator appear in Appendix C.

As soon as a positive response was received indicating the school's willingness to cooperate in the study, an AAHPER Youth Fitness Test Manual, data recording cards, and an accompanying letter with directions were sent to the test administrator, whom the principal had designated in the response letter. This designated person was generally the physical education teacher for the school. A copy of the data recording card and set of instructions appear in Appendix D.

Each test administrator was asked to return the data sheets as soon as possible. Approximately three weeks after each tester received the final instructions, test manual, and data sheets, a reminder was sent to speed up the return of the information (Appendix E).

Three weeks later, person to person telephone calls were made to every test administrator who had not as yet returned the data sheets.

Any incomplete data sheets were sent back to the tester for additional data.

If a negative response was received indicating a school's unwillingness to cooperate in the study, another school was randomly selected

from that area by the pulling-out-of-the-hat technique.

Initially all regions representing Class "B" schools and all sections representing Class "A" schools were represented in the study. After the long distance telephone calls were made to those schools that had not returned their results, two regions and one section were left unrepresented. Due to lack of time, no schools were selected to represent these three areas.

### III. ADMINISTERING THE TEST

All test administrators were to follow the exact instructions which appear in the AAHPER Youth Fitness Test Manual. Instructions appear in Appendix F.

## CHAPTER IV

### ANALYSIS AND DISCUSSION OF DATA

The AAHPER Youth Fitness Test was administered to one thousand girls in grades seven through ten in the state of South Dakota. Appendix A represents the sample, which was selected proportionately to the school's enrollment. Because several schools did not send the specified number of girls and because two regions and one section were not represented at all in the study, the total number of subjects was two hundred short of the original sample specified in Appendix A. Appendix B lists the schools which participated in the study. Each school is listed under the region or section which it represents according to the South Dakota High School Activities' Association.

The South Dakota median scores on each test item were compared to the median scores of the national AAHPER norms. This was done according to age, but not according to the Nielson-Cozens Classification Index.

#### I. ORGANIZATION OF DATA

All scores were recorded on data processing sheets and then punched onto IBM cards to minimize error. The frequency distribution for every test item was found through the use of the IBM machines. Percentile scores were then computed and results were arranged in tabular form to establish norms for South Dakota.



## II. ANALYSIS AND DISCUSSION OF RESULTS

Percentile scores for South Dakota appear on Tables I through XV in Appendix G. These norms are based on age (Tables I through VII) and the Nielson-Cozens Classification Index (Tables IX through XV). Table VIII shows how each pupil's classification was determined.

The comparison of South Dakota norms to the national norms is shown according to age in Figures 1 through 7.

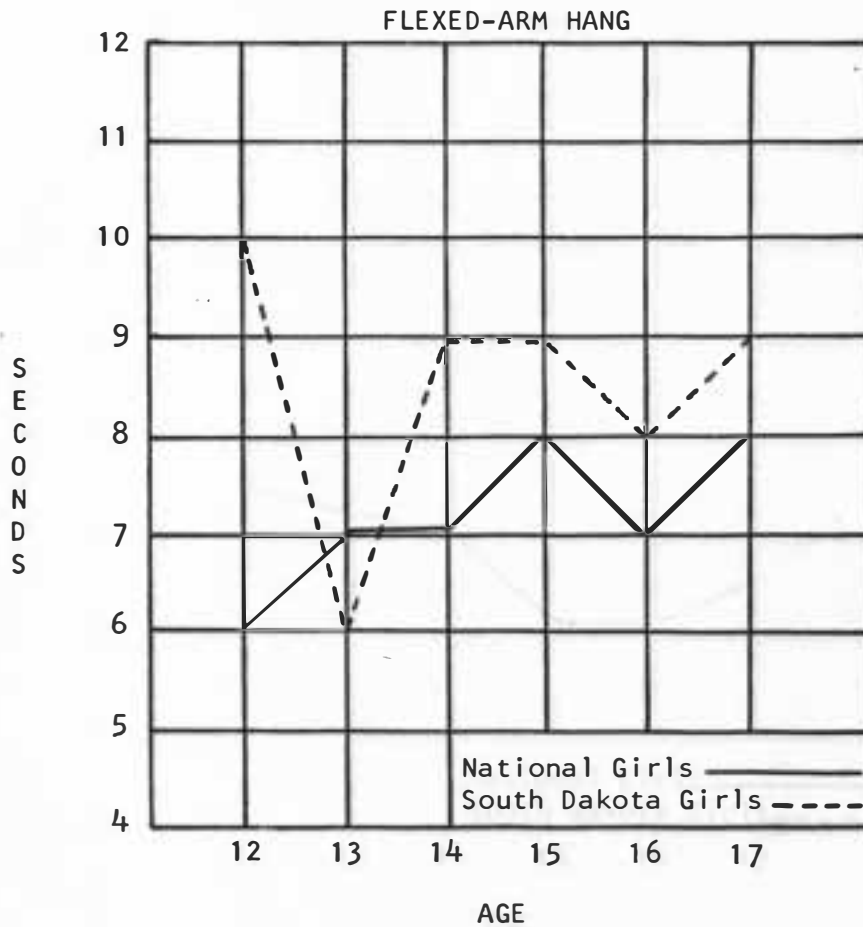


FIGURE 1

COMPARISON OF YOUTH FITNESS DATA BETWEEN NATIONAL  
GIRLS AND SOUTH DAKOTA GIRLS, FLEXED-ARM HANG

Figure 1 shows that the medians for the flexed-arm hang for South Dakota girls are higher than the medians for national girls at every age level with the exception of age thirteen, which is below.

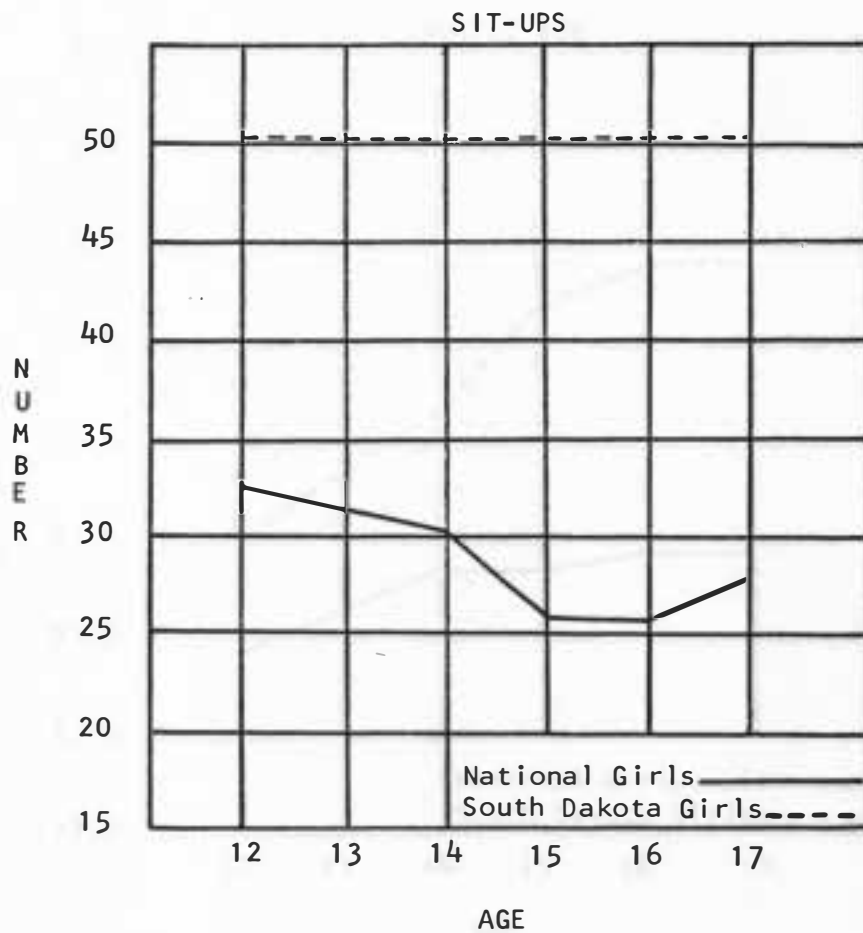


FIGURE 2

COMPARISON OF YOUTH FITNESS DATA BETWEEN NATIONAL  
GIRLS AND SOUTH DAKOTA GIRLS, SIT-UPS

Figure 2 shows that the medians for sit-ups for South Dakota girls are considerably higher than the medians for national girls at every age level.

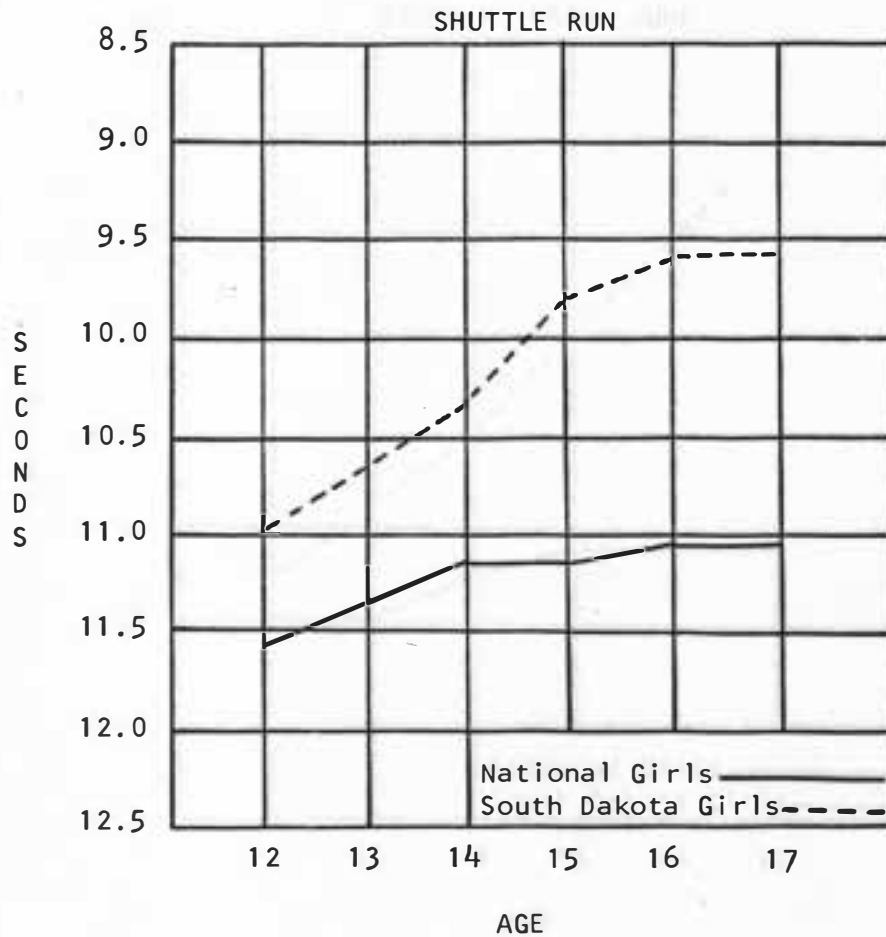


FIGURE 3

COMPARISON OF YOUTH FITNESS DATA BETWEEN NATIONAL  
GIRLS AND SOUTH DAKOTA GIRLS, SHUTTLE RUN

Figure 3 shows that the medians for the shuttle run for South Dakota girls are higher than the medians for national girls at every age level.

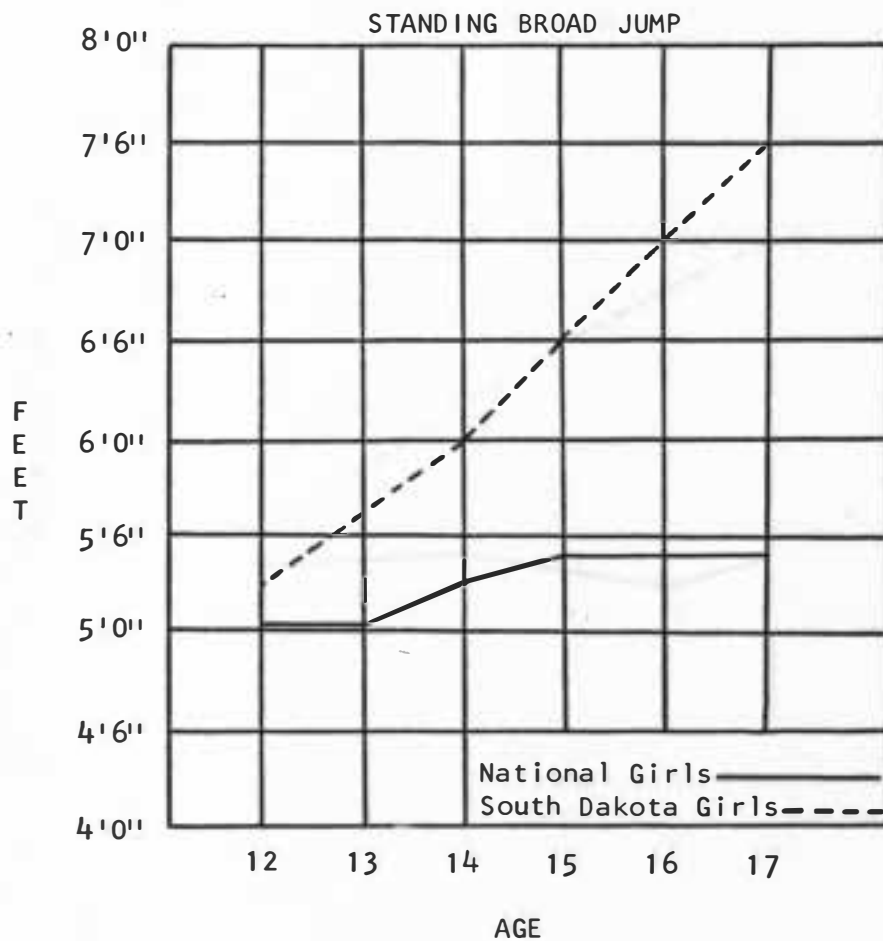


FIGURE 4

COMPARISON OF YOUTH FITNESS DATA BETWEEN NATIONAL GIRLS  
AND SOUTH DAKOTA GIRLS, STANDING BROAD JUMP

Figure 4 shows that the medians for the standing broad jump for South Dakota girls are higher than the medians for national girls at every age level.

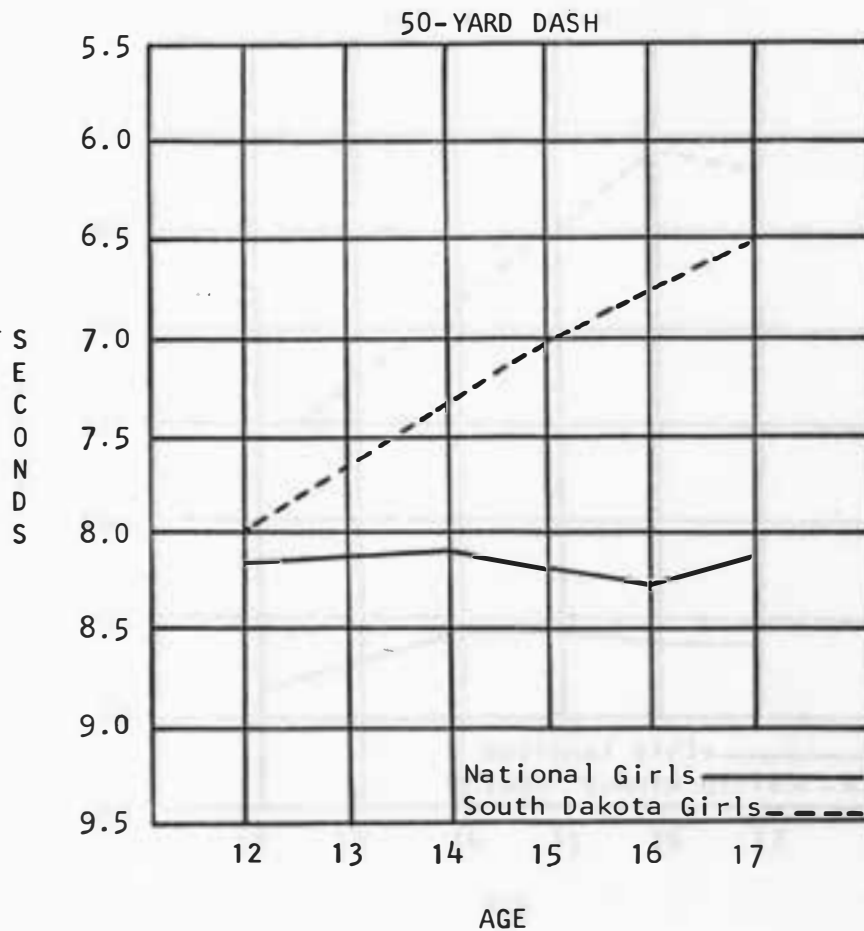


FIGURE 5

COMPARISON OF YOUTH FITNESS DATA BETWEEN NATIONAL  
GIRLS AND SOUTH DAKOTA GIRLS, 50-YARD DASH

Figure 5 shows that the medians in the 50-yard dash for South Dakota girls are higher than the medians for national girls at every age level.

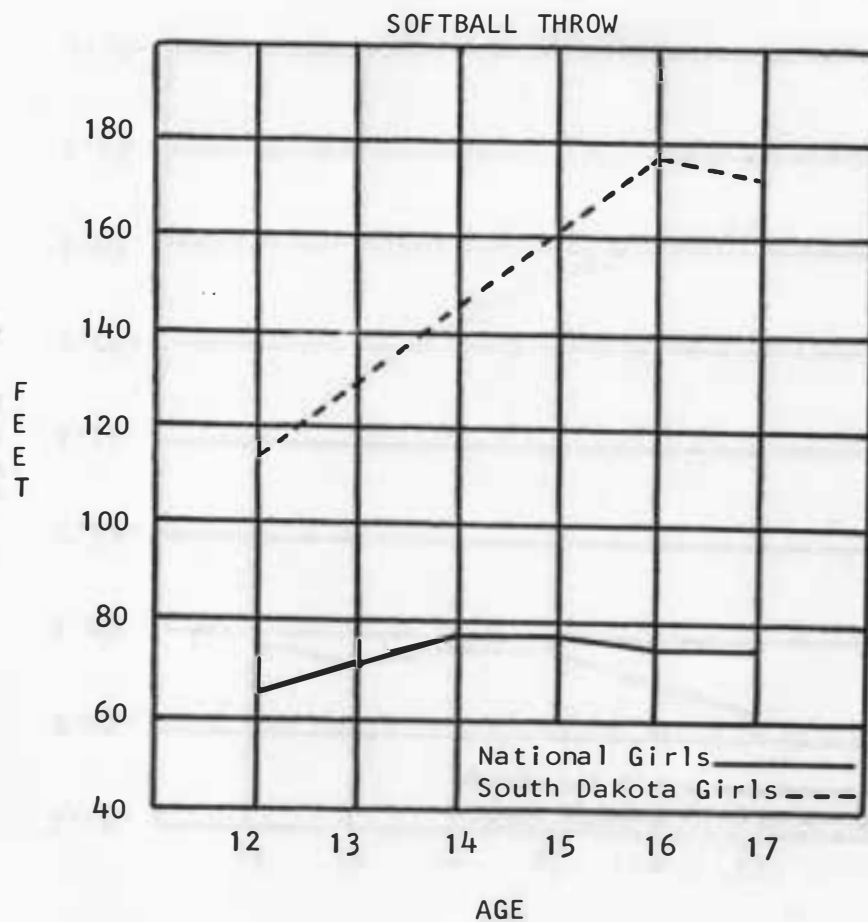


FIGURE 6

COMPARISON OF YOUTH FITNESS DATA BETWEEN NATIONAL GIRLS AND SOUTH DAKOTA GIRLS, SOFTBALL THROW

Figure 6 shows that the medians in the softball throw for South Dakota girls are higher than the medians for national girls at every age level.

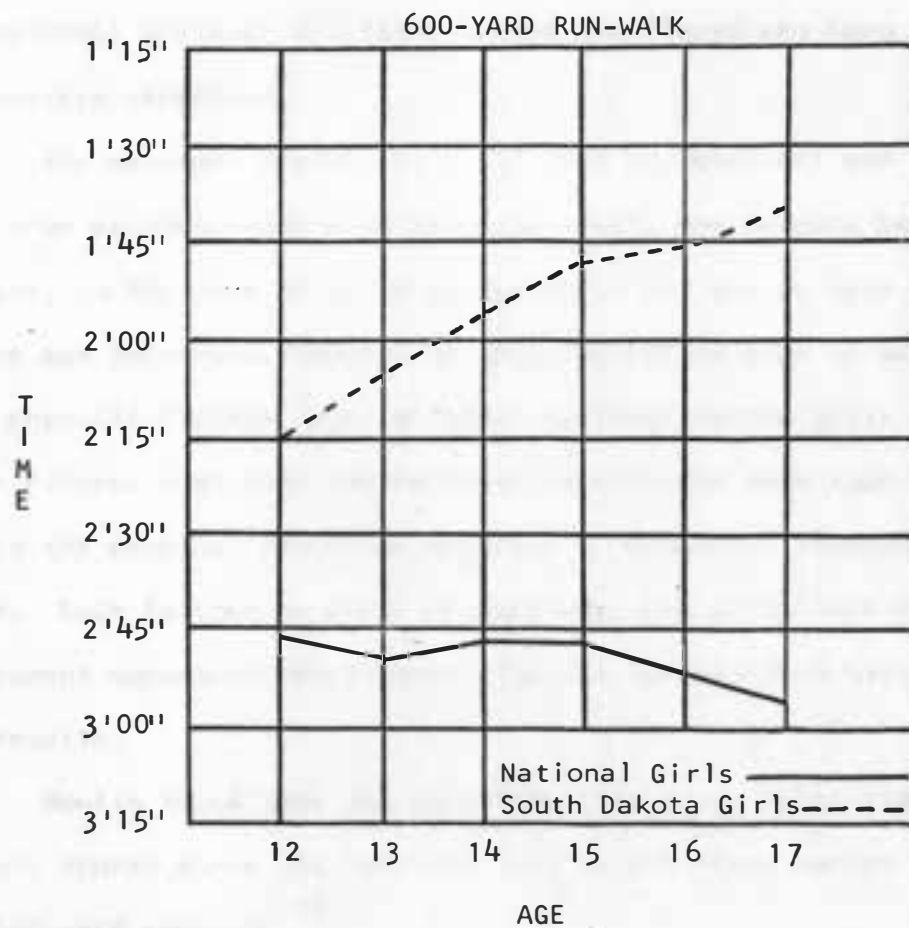


FIGURE 7

COMPARISON OF YOUTH FITNESS DATA BETWEEN NATIONAL GIRLS  
AND SOUTH DAKOTA GIRLS, 600-YARD RUN-WALK

Figure 7 shows that the medians in the 600-yard run-walk for South Dakota girls are higher than the medians for national girls at every age level.



The medians for South Dakota girls are higher than the medians for national girls on all items except the flexed-arm hang where the medians are identical.

The national scores for girls tend to level off and in some cases even drop as they reach a certain age level, one example being Figure 7. But, in the case of South Dakota girls the scores tend to increase as the age increases, showing no leveling off or drop in score. The high physical fitness level attained by South Dakota girls on the AAHPER Youth Fitness Test does not necessarily indicate that such fitness is due to the physical education programs as conducted throughout the state. Such factors as rural occupational and variations in summer employment opportunities of more vigorous nature might have influenced the results.

Howlin found that the boys from four Sioux Falls elementary schools scored above the national mean on all items except pull-ups and the 600-yard run-walk.<sup>10</sup>

Lilevjen and Schlekeway reported that all classifications of the Watertown Junior High School boys were above the fiftieth percentile of the national norms in all test items.<sup>11</sup> These scores were higher than the scores achieved in this study in the sit-ups, the shuttle run, and the 600-yard run-walk. There was very little difference between the two sets of scores in the pull-up, the 50-yard dash, and the softball

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<sup>10</sup>Ibid., p. 71.

<sup>11</sup>Lilevjen, op. cit., p. 26.

throw.

Since the data appearing in Figures 1 through 7 illustrate a difference between the national medians and the South Dakota medians, the null hypothesis was rejected.

## CHAPTER

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

#### I. SUMMARY

The purpose of the study was to establish norms for the AAHPER Youth Fitness Test for South Dakota girls in grades seven through ten and to compare their scores with those of national girls.

One school was selected to represent each region or section of the South Dakota High School Activities' Association. The number selected from each school was in proportion to the school's enrollment.

The AAHPER Youth Fitness Test was administered to one thousand South Dakota girls in grades seven through ten. Norms were established by computing every fifth percentile. This was done according to age and the Nielson-Cozens Classification Index. Then the scores of South Dakota children were compared with the scores of national children, using age only. The medians of the South Dakota girls were compared to the medians of the national girls.

#### FINDINGS

The medians for South Dakota girls were higher than the medians for national girls on all items except for the flexed-arm hang where the medians were identical.

The scores of South Dakota girls tended to show improvement as age increased whereas the scores for national girls tended to level off or drop.

## II. CONCLUSION

Within the limitations of the study, the following conclusion was made:

1. South Dakota girls scored equal to, or well above the national AAHPER Youth Fitness Test medians on all test items.

## RECOMMENDATIONS

The following are the investigator's recommendations for possible future study in the area of physical fitness testing of South Dakota youth:

1. That a similar study be undertaken to establish physical fitness norms for boys and girls in grades kindergarten through six.
2. That a similar study be conducted to establish physical fitness norms for college men and women in the eleven colleges and universities in South Dakota.
3. That a similar study be undertaken using the new shortened form of the AAHPER Youth Fitness Test.

1. The first part of the paper discusses the importance of the research and the objectives of the study.

2. The second part of the paper discusses the methodology used in the study and the data collection process.

3. The third part of the paper discusses the results of the study and the statistical analysis.

4. The fourth part of the paper discusses the conclusions of the study and the implications for future research.

5. The fifth part of the paper discusses the limitations of the study and the strengths of the research.

6. The sixth part of the paper discusses the contributions of the study to the field of research.

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## APPENDIX A

## 1200 SUBJECTS

## Class "A"

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Section	% each section is of its class	Students per section	Students per grade
1	10	15	15
2	8	12	12
3	23	15	35
4	11	17	17
5	11	17	17
6	8	12	12
7	20	15	30
8	8	12	12

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## Class 'B'

Region	% each region is of its class	Students per region	Students per grade
1	10	60	15
2	12	72	18
3	10	60	15
4	14	84	21
5	15	92	23
6	14	84	21
7	11	68	17
8	13	80	20

## APPENDIX B

## SCHOOLS REPRESENTING CLASS "B" REGIONS

- Region 1 Waubay
- Region 2 Not represented
- Region 3 Volga (Sioux Valley)
- Region 4 Fort Pierre and Kimball
- Region 5 Alexandria
- Region 6 Not represented
- Region 7 Springfield and Wagner
- Region 8 Deadwood

## SCHOOLS REPRESENTING CLASS "A" SECTIONS

- Section 1 Milbank
- Section 2 Brookings
- Section 3 Sioux Falls (Lincoln and Axtell Park)
- Section 4 Not represented
- Section 5 Mitchell
- Section 6 Vermillion
- Section 7 Pierre and Hot Springs
- Section 8 Sturgis

APPENDIX C

\_\_\_\_\_ I will participate in the study.

\_\_\_\_\_ I will not participate in the study.

\_\_\_\_\_ Name(s) of the person(s) in charge of administering the test.

\_\_\_\_\_ AAHPER Youth Fitness Test has already been administered.

\_\_\_\_\_ AAHPER Youth Fitness Test has not already been administered.

\_\_\_\_\_ Name of school.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## COLLEGE OF ARTS AND SCIENCE

DEPARTMENT OF HEALTH, PHYSICAL EDUCATION AND RECREATION

Research Office

Mr. John Doe, Principal  
Jameston High School  
Jameston, South Dakota

Dear Principal Doe:

A state-wide survey is being conducted to determine the status of the physical fitness of South Dakota boys and girls in grades seven through ten using the AAHPER Youth Fitness Test. Through the cooperation of the schools selected in the sampling, norms for the state will be established and compared to the national AAHPER norms.

Ninety-six boys and ninety-six girls in grades seven through ten from Jameston High School will be tested.

If the AAHPER Youth Fitness Test has already been administered this year to the students in grades seven through ten, the results may be used providing the test has been administered according to directions given in the AAHPER Youth Fitness Test Manual.

We would like to assure you that the information obtained is completely confidential in that no school will be individually identified with the results. If you agree to participate in this study, please forward this letter to the appropriate personnel. Another letter will follow with a test manual and instructions as to how to select your sample. Please send your reply by Wednesday, February 26, 1969.

Your cooperation in this study would be greatly appreciated.

Sincerely yours,

Judy Busch  
Glenn Rasmussen  
Graduate Students

Dear Principal

As State Director of Health, Physical Education and Recreation, I whole heartedly endorse the study on the status of Physical Fitness of South Dakota boys and girls in grades seven through ten being conducted by Judy Busch and Glenn Rasmussen of South Dakota State University.

This endeavor is a project of the state-wide Task Force endorsed by the Department of Public Instruction.

Your cooperation and concern relative to this study will be greatly appreciated. We are vitally concerned the South Dakota youth maintain the level of fitness necessary to normal growth and development.

As stated by Plato, "It is not the mind, it is not the body we are training; it is the man and we must not divide him into two parts. We should not fashion one without the other but make them draw together like two horses harnessed to a coach."

Respectfully yours,

RICHARD A. NANKIVEL  
Specialist; Health,  
Physical Education  
and Recreation

## APPENDIX D

CITY \_\_\_\_\_

STUDENT'S NAME OR I.D. NUMBER \_\_\_\_\_

GRADE \_\_\_\_\_ DATE OF BIRTH \_\_\_\_\_

SEX \_\_\_\_\_ HEIGHT \_\_\_\_\_ INCHES WEIGHT \_\_\_\_\_ POUNDS

## TEST ITEMS:

FLEXED-ARM HANG \_\_\_\_\_ SECONDS SIT-UPS \_\_\_\_\_ NUMBER

SHUTTLE RUN \_\_\_\_\_ SECONDS

STANDING BROAD JUMP \_\_\_\_\_ FEET \_\_\_\_\_ INCHES

50-YARD DASH \_\_\_\_\_ SECONDS SOFTBALL THROW \_\_\_\_\_ FEET

600-YARD RUN-WALK \_\_\_\_\_ MINUTES \_\_\_\_\_ SECONDS

## COLLEGE OF ARTS AND SCIENCE

DEPARTMENT OF HEALTH, PHYSICAL EDUCATION AND RECREATION

Research Office

Mrs. Jane Doe, Instructor  
Jameston High School  
Jameston, South Dakota

Dear Mrs. Doe:

I have received confirmation of your cooperation in our study.

I will only need the test data of 96 girls in grades 7-10 (equal number per grade). It is important that each student in the class has an equal chance of becoming a subject.

Since you have already administered the AAHPER Youth Fitness Test this year, you can do one of two things: you can send me all of the students' scores and I will select the sample, or you can select the sample by putting all of the students' names (or numbers) in a box and drawing the number of subjects required per class from the box.

Do not be alarmed if the students selected are either all above or all below average in ability; the use of these subjects selected by random sampling is essential to obtain a representative sample. Please do not select the subjects subjectively!

Regardless of whether you select the sample or whether we do, you still must fill out the data sheets on each student and return them as soon as possible. Once again your cooperation is greatly appreciated.

Sincerely yours,

Judy Busch  
Graduate Student

## COLLEGE OF ARTS AND SCIENCE

DEPARTMENT OF HEALTH, PHYSICAL EDUCATION AND RECREATION

Research Office

Mrs. Jane Doe, Instructor  
Physical Education  
Jameston High School  
Jameston, South Dakota

Dear Mrs. Doe:

A few weeks ago a letter was sent to your principal asking permission for cooperation from your school in a study. He consented and referred me to you for further cooperation in administering the test.

I will only need the test data of 96 girls in grades 7-10. It is important that each student in the class has an equal chance of becoming a subject, only those students with heart conditions should be omitted. I suggest selecting the sample by putting all of the students' names (or numbers) in a box and pulling the number of names required from the box.

Do not be alarmed if the students selected are either all above or all below average in ability; the use of these subjects selected by random sampling is essential to obtain a representative sample. Please do not select the students subjectively.

The directions for administering the AAHPER Youth Fitness Test can be found in the enclosed manual. It is very important that the instructions for each test item be followed. Any minor changes will change the entire study.

Please fill out completely the enclosed data sheets and return them as soon as the testing has been completed.

Sincerely yours,

Judy Busch  
Graduate Student



## APPENDIX E

Mrs. Jane Doe, Instructor  
Physical Education  
Jameston High School  
Jameston, South Dakota

Dear Mrs. Doe:

This is just a reminder to please hurry and send in the results of the AAHPER Youth Fitness Test.

Thank you.

Respectfully yours,

Judy Busch  
Graduate Student

## APPENDIX F

## DIRECTIONS FOR ADMINISTERING THE AAHPER YOUTH FITNESS TEST\*

The following is a description of each of the seven test items with a description of the necessary equipment needed for the test, the rules for the test item, and the method of scoring the test item:

## I. FLEXED-ARM HANG (all girls except college girls)

Equipment: A horizontal bar approximately  $1\frac{1}{2}$  inches in diameter is preferred. A doorway gym bar is good to use; if no regular equipment is available, a piece of pipe can serve the purpose. A stop watch is needed.

Description: The height of the bar should be adjusted so it is approximately equal to the pupil's standing height. The pupil should use the overhand grasp. With the assistance of two spotters, one in front and one in back of the pupil, the pupil raises her body off the floor to a position where the chin is above the bar, the elbows are flexed, and the chest is close to the bar. The pupil holds this position as long as possible.

Rules: 1. The stop watch is started as soon as the subject takes the hanging position.

2. The watch is stopped when a) pupil's chin touches the bar, b) pupil's head tilts backward to keep chin above the bar, c) pupil's chin falls below the level of the bar.

Scoring: Record in seconds to the nearest second the length of time the subject holds the hanging position.

## II. SIT-UP

Equipment: Mat or floor.

Description: The pupil lies on his back, either on the floor or on a mat, with legs extended and feet about two feet apart. His hands are placed on the back of the neck with the fingers interlaced. Elbows are held out. A partner holds the ankles

\*The directions for the AAHPER Fitness Test are taken from the American Association for Health, Physical Education and Recreation Youth Fitness Test Manual, revised edition, 1965.

down, the heels being in contact with the mat or floor at all times. The pupil sits up, turning the trunk to the left and touching the right elbow to the left knee, returns to starting position, then sits up turning the trunk to the right and touching the left elbow to the right knee. The exercise is repeated, alternating sides.

- Rules:
1. The fingers must remain in contact behind the neck throughout the exercise.
  2. The knees must be on the floor during the sit-up but may be slightly bent when touching elbow to knee.
  3. The back should be rounded and the head and elbows brought forward when sitting up as a "curl" up.
  4. When returning to starting position, elbows must be flat on the mat before sitting up again.

Scoring: One point is given for each complete movement of touching elbow to knee. No score should be counted if the fingertips do not maintain contact behind the head, if knees are bent when the pupil lies on his back or when he begins to sit up, or if the pupil pushes up off the floor from an elbow. The maximum number of sit-ups for girls is 50 and 100 for boys.

### III. SHUTTLE RUN

Equipment: Two blocks of wood, 2'x2'x4", and stop watch. Pupils should wear sneakers or run barefooted.

Description: Two parallel lines are marked on the floor thirty feet apart. The width of a regulation volleyball court serves as a suitable area. Place the blocks of wood behind one of the lines as indicated in the manual. The pupil starts behind the other line. On the signal "Ready? Go!" the pupil runs to the blocks, picks one up, runs back to the starting line, and places the block behind the line; he then runs back and picks up the second block, which he carries back across the starting line. If the scorer has two stopwatches or one with a split-second timer, it is preferable to have two pupils running at the same time. To eliminate the necessity of returning the blocks after each race, start the races alternately, first from behind one line and then from behind the other.

Rules: Allow two trials with some rest between.

Scoring: Record the time of the better of the two trials to the nearest tenth of a second.

#### IV. STANDING BROAD JUMP

Equipment: Mat, floor, or outdoor jumping pit, and tape measure.

Description: Pupil stands as instructed with the feet several inches apart and the toes just behind the take-off line. Preparatory to jumping, the pupil swings with the arm backward and bends the knees. The jump is accomplished by simultaneously extending the knees and swinging forward the arms.

Rules: 1. Allow three trials.  
2. Measure from the take-off line to the heel or other part of the body that touches the floor nearest the take-off line.  
3. When the test is given indoors, it is convenient to tape the tape measure to the floor and have the pupils jump along the tape. The scorer stands to the side and observes the mark to the nearest inch.

Scoring: Record the best of the three trials in feet and inches to the nearest inch.

#### V. 50-YARD DASH

Equipment: Two stopwatches or one with a split-second timer.

Description: It is preferable to administer this test to two pupils at a time. Have both take positions behind the starting line. The starter will use the commands "Are you ready?" and "Go!" The latter will be accompanied by a downward sweep of the starter's arm to give a visual signal to the timer, who stands at the finish line.

Rules: The score is the amount of time between the starter's signal and the instant the pupil crosses the finish line.

Scoring: Record in seconds to the nearest tenth of a second.

#### VI. SOFTBALL THROW FOR DISTANCE

Equipment: 12" softball, small metal or wooden stakes, and tape measure.

Description: A football field marked in conventional fashion (5-yard intervals) makes an ideal area for this test. If this

is not available, it is suggested that lines be drawn parallel to the restraining line, five yards apart. The pupil throws the ball while remaining within two parallel lines, six feet apart. Mark the point of landing with one of the small stakes. If his second or third throw is farther, move the stake accordingly so that, after three throws, the stake is at the point of the pupil's best throw. It was found expedient to have the pupil jog out to his stake and stand there; and then, after five throws (best throws marked) by five pupils, measuring the best throws of the five pupils that have thrown each three times. By having the students stand by their stake the chance of recording the wrong score is reduced.

- Rules:
1. Only an overhand throw may be used.
  2. Three throws are allowed.
  3. The distance recorded is the distance measured at right angles from the point of land to the restraining line.

Scoring: Record the best of the three trials to the nearest foot.

## VII. 600-YARD RUN-WALK

Equipment: Track or area marked accordingly so that 600 yards are known, and stopwatch.

Description: Pupil uses a standing start. At the signal "Ready? Go!" the pupil starts running the 600-yard distance. The running may be interspersed with walking. It is possible to have a dozen pupils run at one time by having the pupils pair off before the start of the event. Then each pupil listens for and remembers his partner's time as the latter crosses the finish. The timer merely calls out the times as the pupils cross the finish.

Rules: Walking is permitted, but the object is to cover the distance in the shortest time.

Scoring: Record in minutes and seconds.

APPENDIX G

Percentile scores for girls in grades 7-10 are given in Tables I through XV.

TABLE I  
 Vocabulary and Reading Comprehension  
 Percentile Scores for Girls in Grades 7-10

Percentile	7	8	9	10
90-100	100	100	100	100
80-90	95	95	95	95
70-80	85	85	85	85
60-70	75	75	75	75
50-60	65	65	65	65
40-50	55	55	55	55
30-40	45	45	45	45
20-30	35	35	35	35
10-20	25	25	25	25
0-10	15	15	15	15

TABLE I

## FLEXED-ARM HANG FOR SOUTH DAKOTA GIRLS

Percentile Scores Based on Age / Test Scores in Seconds

Percentile	Age						Percentile
	12	13	14	15	16	17	
100th	70	82	71	75	73	75	100th
95th	42	41	35	35	40	33	95th
90th	35	32	30	30	32	26	90th
85th	24	20	21	22	26	22	85th
80th	20	15	17	19	20	20	80th
75th	17	12	16	15	18	17	75th
70th	15	10	14	14	15	14	70th
65th	14	10	12	13	11	13	65th
60th	12	9	12	11	9	12	60th
55th	10	7	10	10	9	10	55th
50th	10	6	9	9	8	9	50th
45th	9	6	8	8	7	8	45th
40th	8	5	7	7	6	7	40th
35th	6	4	6	6	5	6	35th
30th	5	4	5	5	4	5	30th
25th	3	3	4	4	3	5	25th
20th	2	2	3	3	2	4	20th
15th	1	2	2	2	1	3	15th
10th	1	1	1	1	1	1	10th
5th	0	0	1	1	0	0	5th
0	0	0	0	0	0	0	0

TABLE 11

## SIT-UP FOR SOUTH DAKOTA GIRLS

Percentile Scores Based on Age / Test Scores in Number of Sit-Ups

Percentile	Age						Percentile
	12	13	14	15	16	17	
100th	50	50	50	50	50	50	100th
95th	50	50	50	50	50	50	95th
90th	50	50	50	50	50	50	90th
85th	50	50	50	50	50	50	85th
80th	50	50	50	50	50	50	80th
75th	50	50	50	50	50	50	75th
70th	50	50	50	50	50	50	70th
65th	50	50	50	50	50	50	65th
60th	50	50	50	50	50	50	60th
55th	50	50	50	50	50	50	55th
50th	50	50	50	50	50	50	50th
45th	50	50	50	50	50	50	45th
40th	50	50	50	50	50	50	40th
35th	50	50	50	50	50	50	35th
30th	46	50	50	50	50	50	30th
25th	39	49	50	50	50	50	25th
20th	30	45	48	50	50	50	20th
15th	26	40	44	50	50	40	15th
10th	21	31	37	49	42	12	10th
5th	13	25	26	43	35	12	5th
0	7	8	10	20	22	10	0



TABLE III

## SHUTTLE RUN FOR SOUTH DAKOTA GIRLS

Percentile Scores Based on Age / Test Scores in Seconds and Tenths

Percentile	Age						Percentile
	12	13	14	15	16	17	
100th	9.3	8.9	7.0	8.0	8.4	8.6	100th
95th	9.8	9.6	9.0	8.9	8.7	9.1	95th
90th	9.8	9.8	9.2	9.2	9.0	9.1	90th
85th	10.0	9.9	9.5	9.2	9.1	9.2	85th
80th	10.1	10.0	9.6	9.3	9.2	9.2	80th
75th	10.2	10.1	9.8	9.4	9.3	9.3	75th
70th	10.4	10.2	9.9	9.5	9.4	9.6	70th
65th	10.5	10.3	10.0	9.6	9.5	9.7	65th
60th	10.6	10.5	10.1	9.7	9.6	9.8	60th
55th	10.7	10.5	10.2	9.8	9.7	9.8	55th
50th	10.8	10.6	10.3	9.9	9.8	9.8	50th
45th	10.9	10.8	10.4	10.0	9.9	9.9	45th
40th	11.0	10.9	10.6	10.2	10.0	9.9	40th
35th	11.1	11.0	10.6	10.3	10.1	9.9	35th
30th	11.3	11.2	10.8	10.4	10.2	10.0	30th
25th	11.4	11.3	11.0	10.6	10.4	10.0	25th
20th	11.6	11.5	11.1	10.8	10.6	10.4	20th
15th	11.8	11.6	11.4	11.0	10.8	10.4	15th
10th	11.9	11.9	11.6	11.4	11.0	10.5	10th
5th	13.0	12.1	12.0	12.2	11.6	10.7	5th
0	14.0	14.7	18.6	14.6	13.0	10.7	0

TABLE IV

## STANDING BROAD JUMP FOR SOUTH DAKOTA GIRLS

Percentile Scores Based on Age / Test Scores in Feet and Inches

Percentile	Age						Percentile
	12	13	14	15	16	17	
100th	6' 10"	8' 11"	8' 0"	8' 8"	8' 8"	8' 0"	100th
95th	6' 1"	7' 0"	7' 3"	8' 1"	7' 11"	7' 11"	95th
90th	5' 11"	6' 4"	7' 0"	7' 11"	7' 9"	7' 10"	90th
85th	5' 10"	6' 2"	6' 7"	7' 7"	7' 7"	7' 10"	85th
80th	5' 9"	6' 1"	6' 6"	7' 4"	7' 5"	7' 7"	80th
75th	5' 8"	6' 0"	6' 5"	7' 2"	7' 4"	7' 7"	75th
70th	5' 7"	5' 11"	6' 3"	7' 1"	7' 4"	7' 7"	70th
65th	5' 6"	5' 10"	6' 2"	6' 9"	7' 3"	7' 6"	65th
60th	5' 5"	5' 9"	6' 1"	6' 8"	7' 2"	7' 5"	60th
55th	5' 4"	5' 8"	6' 0"	6' 7"	7' 0"	7' 5"	55th
50th	5' 3"	5' 7"	5' 10"	6' 5"	6' 11"	7' 4"	50th
45th	5' 2"	5' 5"	5' 9"	6' 3"	6' 8"	7' 2"	45th
40th	5' 1"	5' 4"	5' 8"	6' 2"	6' 7"	7' 2"	40th
35th	5' 0"	5' 3"	5' 6"	6' 1"	6' 5"	7' 1"	35th
30th	4' 10"	5' 2"	5' 5"	5' 11"	6' 3"	7' 0"	30th
25th	4' 9"	5' 0"	5' 4"	5' 10"	6' 1"	7' 0"	25th
20th	4' 8"	4' 11"	5' 2"	5' 8"	5' 11"	6' 8"	20th
15th	4' 7"	4' 10"	5' 0"	5' 6"	5' 7"	6' 6"	15th
10th	4' 6"	4' 7"	4' 9"	5' 2"	5' 6"	6' 4"	10th
5th	3' 11"	4' 3"	4' 5"	5' 0"	5' 5"	6' 2"	5th
0	3' 6"	3' 6"	4' 5"	4' 4"	5' 5"	6' 0"	0

TABLE V

## 50-YARD DASH FOR SOUTH DAKOTA GIRLS

Percentile Scores Based on Age / Test Scores in Seconds and Tenths

Percentile	Age						Percentile
	12	13	14	15	16	17	
100th	6.5	6.0	5.8	5.4	5.9	6.1	100th
95th	6.9	6.1	6.2	6.3	6.1	6.1	95th
90th	7.0	6.3	6.4	6.4	6.3	6.1	90th
85th	7.1	6.3	6.7	6.4	6.4	6.1	85th
80th	7.2	6.8	6.9	6.5	6.4	6.2	80th
75th	7.4	7.1	6.9	6.6	6.5	6.2	75th
70th	7.5	7.2	7.0	6.6	6.6	6.2	70th
65th	7.7	7.3	7.1	6.7	6.6	6.2	65th
60th	7.8	7.4	7.2	6.8	6.7	6.2	60th
55th	7.9	7.5	7.3	6.9	6.7	6.4	55th
50th	8.0	7.6	7.4	7.0	6.8	6.5	50th
45th	8.1	7.7	7.5	7.0	6.8	6.5	45th
40th	8.1	7.8	7.6	7.1	6.9	6.5	40th
35th	8.2	7.9	7.7	7.2	7.0	6.7	35th
30th	8.4	8.0	7.8	7.3	7.0	6.7	30th
25th	8.5	8.2	7.8	7.4	7.1	6.8	25th
20th	8.5	8.3	8.0	7.6	7.2	7.0	20th
15th	8.7	8.4	8.1	7.8	7.3	7.0	15th
10th	9.3	8.6	8.3	8.0	7.5	7.1	10th
5th	9.5	8.9	8.5	8.2	7.9	7.5	5th
0	11.2	10.3	10.6	9.5	9.7	7.5	0

TABLE VI

## SOFTBALL THROW FOR SOUTH DAKOTA GIRLS

Percentile Scores Based on Age / Test Scores in Feet

Percentile	Age						Percentile
	12	13	14	15	16	17	
100th	187	203	236	241	285	246	100th
95th	168	176	200	215	285	246	95th
90th	153	170	183	207	285	246	90th
85th	146	164	177	196	220	212	85th
80th	143	158	169	189	213	212	80th
75th	136	148	166	186	205	193	75th
70th	131	144	160	181	200	188	70th
65th	128	138	155	178	195	186	65th
60th	125	135	151	173	188	184	60th
55th	122	132	146	169	185	177	55th
50th	118	129	143	164	180	177	50th
45th	115	125	140	158	176	176	45th
40th	111	121	134	154	172	176	40th
35th	105	116	129	151	168	175	35th
30th	103	112	126	146	164	165	30th
25th	101	108	122	142	158	164	25th
20th	93	104	119	136	142	159	20th
15th	88	99	115	132	136	154	15th
10th	82	93	107	120	125	140	10th
5th	60	84	95	105	110	132	5th
0	39	60	71	81	80	132	0

TABLE VII

## 600-YARD RUN-WALK FOR SOUTH DAKOTA GIRLS

Percentile Scores Based on Age / Test Scores in Minutes and Seconds

Percentile	Age						Percentile
	12	13	14	15	16	17	
100th	1'47"	1'41"	1'31"	1'27"	1'26"	1'31"	100th
95th	1'51"	1'47"	1'34"	1'33"	1'34"	1'31"	95th
90th	1'53"	1'52"	1'35"	1'37"	1'36"	1'31"	90th
85th	1'55"	1'54"	1'40"	1'40"	1'39"	1'34"	85th
80th	1'57"	1'57"	1'44"	1'43"	1'39"	1'35"	80th
75th	2' 4"	1'59"	1'46"	1'44"	1'41"	1'36"	75th
70th	2' 6"	2' 1"	1'48"	1'47"	1'43"	1'37"	70th
65th	2' 7"	2' 2"	1'51"	1'49"	1'44"	1'38"	65th
60th	2' 9"	2' 4"	1'53"	1'51"	1'46"	1'39"	60th
55th	2'10"	2' 6"	1'56"	1'53"	1'48"	1'39"	55th
50th	2'12"	2' 8"	1'58"	1'54"	1'50"	1'40"	50th
45th	2'15"	2'11"	2' 0"	1'56"	1'52"	1'42"	45th
40th	2'17"	2'13"	2' 1"	1'57"	1'53"	1'47"	40th
35th	2'20"	2'14"	2' 4"	1'59"	1'56"	1'48"	35th
30th	2'24"	2'16"	2' 6"	2' 1"	1'58"	1'48"	30th
25th	2'28"	2'18"	2' 8"	2' 3"	1'59"	1'49"	25th
20th	2'30"	2'21"	2'11"	2' 5"	2' 1"	1'50"	20th
15th	2'35"	2'26"	2'13"	2'11"	2' 3"	1'52"	15th
10th	2'49"	2'32"	2'15"	2'17"	2' 7"	1'57"	10th
5th	3' 1"	2'46"	2'30"	2'22"	2'10"	2' 0"	5th
0	4' 5"	3'32"	3'13"	2'55"	2'35"	2'55"	0

TABLE VIII  
 CLASSIFICATION INDEX FOR GIRLS  
 GRADES 5, 6, 7, 8, 9\*

Exponent	Age (months)	Height (inches)	Weight (pounds)	Sum of exponents	Class
1	120-125	50-51	60-65	0-9	A
2	126-131	52-53	66-70	10-14	B
3	132-137		71-75	15-19	C
4	138-143	54-55	76-80	20-24	D
5	144-149		81-85	25-29	E
6	150-155	56-57	86-90	30-34	F
7	156-161		91-95	35-38	G
8	162-167	58-59	96-100	39-above	H
9	168-173		101-105		
10	174-179	60-61	106-110		
11	180-185		111-115		
12	186-191	62-63	116-120		
13	192-197		121-125		
14	198-203	64-65	126-130		
15	204-209	66-67	131-133		
16	210-215	68	134-136		
17	216	69	137		

\*For girls in grade 10 see Tables IX-XV, column HSG.

TABLE IX

## FLEXED-ARM HANG FOR SOUTH DAKOTA GIRLS

Percentile Scores Based on Classification Index / Test Scores in Seconds

Percentile	Classification Index								Percentile
	B	C	D	E	F	G	H	HSG	
100th	75	72	62	71	58	60	50	80	100th
95th	40	42	32	38	40	30	28	50	95th
90th	30	38	29	32	30	21	16	34	90th
85th	28	30	25	25	23	19	12	27	85th
80th	20	29	21	22	20	12	10	25	80th
75th	19	22	17	20	16	12	9	19	75th
70th	15	17	14	16	14	11	9	15	70th
65th	14	16	12	14	11	10	7	14	65th
60th	12	16	11	12	10	9	6	12	60th
55th	11	14	10	11	9	8	5	11	55th
50th	10	11	9	11	8	8	4	10	50th
45th	10	11	8	10	7	6	4	9	45th
40th	8	10	6	8	6	5	2	9	40th
35th	6	9	6	7	5	4	1	7	35th
30th	6	7	6	6	4	3	1	6	30th
25th	5	6	5	6	3	3	1	5	25th
20th	4	5	4	5	2	1	1	4	20th
15th	3	3	2	3	1	1	1	4	15th
10th	2	1	1	1	1	1	1	3	10th
5th	1	0	1	1	0	0	0	2	5th
0	0	0	0	0	0	0	0	0	0

TABLE X

## SIT-UP FOR SOUTH DAKOTA GIRLS

Percentile Scores Based on Classification Index / Test Scores in Number of Sit-Ups

Percentile	Classification Index							HSG	Percentile
	B	C	D	E	F	G	H		
100th	50	50	50	50	50	50	50	50	100th
95th	50	50	50	50	50	50	50	50	95th
90th	50	50	50	50	50	50	50	50	90th
85th	50	50	50	50	50	50	50	50	85th
80th	50	50	50	50	50	50	50	50	80th
75th	50	50	50	50	50	50	50	50	75th
70th	50	50	50	50	50	50	50	50	70th
65th	50	50	50	50	50	50	50	50	65th
60th	50	50	50	50	50	50	50	50	60th
55th	50	50	50	50	50	50	50	50	55th
50th	50	50	50	50	50	50	50	50	50th
45th	50	50	50	50	50	50	50	50	45th
40th	50	45	50	50	50	50	50	50	40th
35th	50	44	50	50	50	50	50	50	35th
30th	50	43	50	50	50	50	50	50	30th
25th	50	41	47	50	50	50	50	50	25th
20th	34	39	40	48	47	50	50	50	20th
15th	34	35	36	42	40	43	49	50	15th
10th	34	28	33	36	27	31	42	47	10th
5th	0	14	33	24	19	25	32	30	5th
0	0	0	0	0	0	0	0	0	0



TABLE XI

## SHUTTLE RUN FOR SOUTH DAKOTA GIRLS

Percentile Scores Based on Classification Index / Test Scores in Seconds and Tenths

Percentile	Classification Index							HSG	Percentile
	B	C	D	E	F	G	H		
100th	9.5	9.5	9.3	7.0	7.2	8.9	8.0	8.5	100th
95th	9.5	9.7	9.8	9.3	9.5	9.4	9.9	8.9	95th
90th	9.9	9.8	10.0	9.7	9.7	9.5	10.0	9.1	90th
85th	9.9	9.9	10.1	9.9	9.8	9.6	10.0	9.2	85th
80th	9.9	10.0	10.1	10.0	10.0	9.8	10.1	9.3	80th
75th	10.1	10.3	10.2	10.1	10.1	9.9	10.1	9.4	75th
70th	10.1	10.4	10.4	10.2	10.2	10.0	10.2	9.5	70th
65th	10.1	10.5	10.5	10.3	10.3	10.0	10.2	9.6	65th
60th	10.3	10.7	10.6	10.4	10.5	10.1	10.3	9.6	60th
55th	10.3	10.7	10.6	10.5	10.6	10.3	10.4	9.7	55th
50th	10.3	10.9	10.7	10.6	10.7	10.4	10.5	9.8	50th
45th	11.0	11.0	10.8	10.7	10.9	10.5	10.6	9.9	45th
40th	11.0	11.1	10.9	10.8	11.0	10.6	10.7	10.0	40th
35th	11.0	11.2	11.0	11.0	11.1	10.7	10.8	10.1	35th
30th	11.4	11.4	11.2	11.1	11.2	10.8	10.9	10.2	30th
25th	11.4	11.5	11.4	11.3	11.3	11.0	11.1	10.4	25th
20th	11.4	11.7	11.5	11.5	11.4	11.1	11.2	10.5	20th
15th	11.4	11.9	11.8	11.7	11.5	11.4	11.5	10.7	15th
10th	0	12.1	11.9	11.9	11.7	11.7	11.7	11.0	10th
5th	0	0	12.3	12.5	12.6	12.0	12.4	11.8	5th
0	0	0	0	0	0	0	0	0	0

TABLE XII

## STANDING BROAD JUMP FOR SOUTH DAKOTA GIRLS

Percentile Scores Based on Classification Index / Test Scores in Feet and Inches

Percentile	Classification Index								Percentile
	B	C	D	E	F	G	H	HSG	
100th	5' 6"	6' 8"	7' 0"	7' 0"	7' 4"	8' 7"	8' 11"	8' 5"	100th
95th	5' 6"	6' 2"	6' 6"	6' 2"	6' 9"	7' 1"	7' 7"	7' 10"	95th
90th	5' 6"	6' 1"	6' 3"	6' 0"	6' 6"	6' 11"	7' 5"	7' 7"	90th
85th	5' 4"	6' 0"	6' 0"	5' 11"	6' 4"	6' 9"	7' 1"	7' 6"	85th
80th	5' 4"	5' 10"	5' 10"	5' 10"	6' 2"	6' 5"	7' 0"	7' 5"	80th
75th	5' 4"	5' 7"	5' 9"	5' 9"	6' 2"	6' 4"	6' 10"	7' 3"	75th
70th	5' 3"	5' 7"	5' 8"	5' 8"	6' 1"	6' 3"	6' 8"	7' 2"	70th
65th	5' 3"	5' 6"	5' 7"	5' 7"	6' 0"	6' 2"	6' 7"	7' 1"	65th
60th	5' 3"	5' 6"	5' 5"	5' 7"	5' 11"	6' 1"	6' 6"	7' 0"	60th
55th	5' 2"	5' 4"	5' 4"	5' 6"	5' 10"	6' 0"	6' 5"	6' 11"	55th
50th	5' 2"	5' 3"	5' 3"	5' 5"	5' 9"	5' 11"	6' 3"	6' 9"	50th
45th	5' 2"	5' 2"	5' 2"	5' 4"	5' 7"	5' 10"	6' 1"	6' 8"	45th
40th	5' 2"	5' 2"	5' 2"	5' 4"	5' 6"	5' 9"	6' 0"	6' 6"	40th
35th	5' 2"	5' 1"	5' 1"	5' 3"	5' 5"	5' 8"	5' 11"	6' 5"	35th
30th	5' 2"	5' 0"	4' 11"	5' 2"	5' 3"	5' 7"	5' 10"	6' 4"	30th
25th	5' 0"	4' 10"	4' 10"	5' 1"	5' 1"	5' 6"	5' 9"	6' 3"	25th
20th	5' 0"	4' 9"	4' 9"	5' 0"	5' 0"	5' 3"	5' 7"	5' 11"	20th
15th	5' 0"	4' 8"	4' 8"	4' 10"	4' 11"	5' 1"	5' 4"	5' 10"	15th
10th	5' 0"	4' 6"	4' 6"	4' 6"	4' 8"	4' 11"	5' 1"	5' 2"	10th
5th	0	0	4' 0"	4' 3"	4' 5"	4' 5"	4' 8"	5' 2"	5th
0	0	0	0	0	0	0	0	0	0

TABLE XIII

## 50-YARD DASH FOR SOUTH DAKOTA GIRLS

Percentile Scores Based on Classification Index / Test Scores in Seconds and Tenths

Percentile	Classification Index							HSG	Percentile
	B	C	D	E	F	G	H		
100th	7.4	6.3	6.5	6.5	6.1	6.1	5.4	6.0	100th
95th	7.4	6.3	7.1	7.0	6.7	6.6	6.2	6.2	95th
90th	7.4	7.0	7.2	7.1	7.0	6.8	6.4	6.3	90th
85th	7.5	7.1	7.3	7.2	7.1	6.9	6.5	6.3	85th
80th	7.5	7.2	7.4	7.3	7.1	6.9	6.6	6.4	80th
75th	7.5	7.4	7.5	7.4	7.2	7.0	6.7	6.5	75th
70th	8.0	7.5	7.6	7.5	7.3	7.1	6.8	6.5	70th
65th	8.0	7.6	7.7	7.5	7.4	7.2	6.8	6.6	65th
60th	8.0	7.7	7.7	7.6	7.5	7.3	6.9	6.7	60th
55th	8.0	7.7	7.9	7.6	7.5	7.4	7.0	6.7	55th
50th	8.4	7.8	7.9	7.7	7.6	7.5	7.1	6.8	50th
45th	8.4	7.9	8.0	7.7	7.7	7.5	7.1	6.8	45th
40th	8.4	7.9	8.1	7.8	7.8	7.6	7.2	6.9	40th
35th	8.4	8.0	8.2	7.9	7.9	7.7	7.2	7.0	35th
30th	8.5	8.0	8.4	8.0	8.0	7.7	7.3	7.1	30th
25th	8.7	8.1	8.4	8.1	8.1	7.8	7.4	7.1	25th
20th	8.7	8.2	8.5	8.2	8.2	7.9	7.6	7.2	20th
15th	8.7	8.4	8.5	8.4	8.4	8.1	7.9	7.5	15th
10th	8.7	8.9	8.7	8.5	8.6	8.2	8.1	7.7	10th
5th	8.7	10.6	9.0	8.6	8.9	8.5	8.5	8.0	5th
0	0	0	0	0	0	0	0	0	0

TABLE XIV

## SOFTBALL THROW FOR SOUTH DAKOTA GIRLS

Percentile Scores Based on Classification Index / Test Scores in Feet

Percentile	Classification Index								Percentile
	B	C	D	E	F	G	H	HSG	
100th	122	170	182	185	188	226	241	251	100th
95th	121	168	153	172	175	192	215	220	95th
90th	105	136	138	160	169	183	207	208	90th
85th	105	136	135	154	163	178	197	198	85th
80th	105	125	132	149	157	172	189	192	80th
75th	104	120	130	145	151	167	184	185	75th
70th	104	117	128	136	146	163	179	182	70th
65th	104	117	123	133	143	157	174	179	65th
60th	88	115	120	130	142	154	170	177	60th
55th	88	115	117	129	141	151	166	175	55th
50th	88	110	113	125	137	147	161	165	50th
45th	87	109	111	124	133	143	151	162	45th
40th	87	108	108	120	130	139	154	156	40th
35th	84	104	106	119	123	136	150	154	35th
30th	84	100	101	116	120	130	146	150	30th
25th	84	95	98	111	118	126	142	146	25th
20th	65	90	93	106	114	121	135	143	20th
15th	65	89	87	100	106	116	132	135	15th
10th	65	82	82	94	101	111	123	132	10th
5th	65	60	66	90	93	87	105	110	5th
0	0	0	0	0	0	0	0	0	0

TABLE XV

## 600-YARD RUN-WALK FOR SOUTH DAKOTA GIRLS

Percentile Scores Based on Classification Index / Test Scores in Minutes and Seconds

Percentile	Classification Index								Percentile
	B	C	D	E	F	G	H	HSG	
100th	1' 59"	1' 48"	1' 50"	1' 42"	1' 37"	1' 35"	1' 19"	1' 24"	100th
95th	2' 0"	1' 53"	1' 53"	1' 47"	1' 42"	1' 39"	1' 35"	1' 36"	95th
90th	2' 0"	1' 56"	1' 57"	1' 51"	1' 48"	1' 44"	1' 38"	1' 37"	90th
85th	2' 4"	2' 0"	1' 59"	1' 53"	1' 50"	1' 46"	1' 41"	1' 40"	85th
80th	2' 4"	2' 2"	2' 0"	1' 57"	1' 52"	1' 48"	1' 43"	1' 40"	80th
75th	2' 4"	2' 3"	2' 3"	1' 59"	1' 53"	1' 50"	1' 45"	1' 42"	75th
70th	2' 8"	2' 5"	2' 5"	2' 1"	1' 56"	1' 52"	1' 47"	1' 43"	70th
65th	2' 8"	2' 6"	2' 7"	2' 3"	1' 58"	1' 54"	1' 49"	1' 44"	65th
60th	2' 8"	2' 7"	2' 9"	2' 5"	2' 0"	1' 55"	1' 52"	1' 45"	60th
55th	2' 11"	2' 8"	2' 12"	2' 7"	2' 1"	1' 57"	1' 54"	1' 47"	55th
50th	2' 11"	2' 8"	2' 13"	2' 8"	2' 3"	1' 58"	1' 55"	1' 48"	50th
45th	2' 12"	2' 10"	2' 15"	2' 10"	2' 4"	2' 0"	1' 57"	1' 49"	45th
40th	2' 12"	2' 12"	2' 16"	2' 12"	2' 7"	2' 2"	1' 59"	1' 52"	40th
35th	2' 12"	2' 13"	2' 17"	2' 13"	2' 10"	2' 4"	2' 2"	1' 53"	35th
30th	2' 12"	2' 15"	2' 18"	2' 14"	2' 13"	2' 7"	2' 4"	1' 55"	30th
25th	2' 12"	2' 15"	2' 21"	2' 16"	2' 15"	2' 7"	2' 6"	1' 57"	25th
20th	2' 12"	2' 24"	2' 24"	2' 20"	2' 17"	2' 10"	2' 10"	2' 0"	20th
15th	2' 12"	2' 24"	2' 26"	2' 23"	2' 21"	2' 15"	2' 14"	2' 10"	15th
10th	2' 12"	2' 30"	2' 31"	2' 30"	2' 26"	2' 19"	2' 21"	2' 13"	10th
5th	2' 12"	2' 47"	2' 34"	2' 38"	2' 41"	2' 50"	2' 25"	2' 17"	5th
0	2' 12"	3' 1"	3' 4"	3' 32"	4' 5"	3' 13"	2' 25"	2' 35"	0