# THE RELATIONSHIP BETWEEN EYE-HAND COORDINATION AND READING ABILITY OF THIRD GRADE CHILDREN

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A Thesis

Presented to

the Faculty of the Department of Physical Education

Kansas State Teachers College

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In Partial Fulfillment

of the Requirements of the Degree

Master of Science

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by

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August 1969

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## ACKNOWLEDGEMENTS

I extend my deep appreciation to my advisor, Dr. George C. Milton, who made this study possible with his continual assistance and encouragement and also to Dr. Paul A. Metzger for his assistance.

My appreciation also to the principal and teachers of the Village School and the students who assisted in the testing program.

Special acknowledgement and appreciation are expressed to my wife who was understanding and thoughtful while this study was in progress.

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# CHAPTER I

## INTRODUCTION

Reading has been recognized as an important part of life since man's early history. Teachers, parents and students recognize that ability to read is of prime importance to successful living as well as to success in school.[1] Reading abilities and habits have social significance as well as individual values. People who read skillfully and habitually will do better in school and in terms of their all-round development.[2] Individuals with a high degree of reading skill will usually be more successful in their jobs and more effective as individuals. A child that can read better contributes to the potential of their group, they eventually become better citizens who understand more about the events and problems which all groups of people must face in the modern world.[3] An informed and enlightened citizenry is essential to the survival of the democratic way of life in a community, state and nation.

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[1] Robert Karlin, Teaching Reading in High School, (Indianapolis-New York: The Bobbs-Merrill Company Inc., 1964), p. 4.

[2] Ruth C. Penty, Reading Ability and High School Drop-Outs, (New York: Bureau of Publications, Teachers College, Columbia University, 1956).

[3] David H. Russell, Children Learn to Read, (New York, Toronto, London: Blaisdell Publishing Company, 1961), p. 3.

Smith and Dechant stated:

> Everyone in the civilized areas of the world--child, adolescent, and adult--has a personal need for being an effective reader. Reading is a primary avenue to all knowledge. It offers access to the information, ideas, ideals, aspirations, and happenings of both the past and the present. Through reading one extends his environment from home and community to the world as a whole.[4]

Physical education has a role to play in the development of the child's reading ability through the development of physical coordination. Physical education director, John Tynes, of Placentia, California says there are indications of a correlation between eye-feet coordination and eye-brain coordination.[5]

Physical education programs in the early years of school are often misunderstood by parents, teachers and administrators. They fail to see the important role that physical education plays in the total development of the child. Since this misconception exists in schools throughout the nation, it seems logical to investigate the relationship between eye-hand coordination and reading ability.

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[4]Henry P. Smith and Emerald V. Dechant, Psychology in Teaching Reading, (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1961), p. 1.

[5]Lowell A. Klappholz, "Physical Coordination-A Key to Academic Learning," Physical Education Newsletter, Letter 7, Volume 12, Dec. 1, 1967.

## I. THE PROBLEM

### Statement of the Problem

The purpose of this study was to investigate the relationship between reading ability and eye-hand coordination in third grade children.

### Statement of the Hypothesis

It was hypothesized that there was a positive correlation between reading ability and eye-hand coordination.

### Delimitations

This study was confined to the eye-hand coordination tests and the reading test which were administered. It was further limited to the third grade children at the Village School in Emporia, Kansas.

## II. DEFINITIONS OF TERMS USED

### Coordination

A delicate adjustment in the play of antagonistic muscles particularly in the manipulation of the extremities.[6]

### Eye-Hand Coordination

The ability to correctly adjust the movement of the hand to visual stimuli.

### Motor Ability

The present acquired and innate ability to perform

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[6]Jay B. Nash, *Physical Education: Its Interpretations and Objectives*, (Dubuque, Iowa: William C. Brown Company Publishers, 1963), p. 165.

motor skills of a general or fundamental nature, exclusive of highly specialized sports or gymnastic techniques.[7]

Reading Ability

The skill to interpret written symbols into meaningful words or ideas.[8]

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[7] Harold M. Barrow and Rosemary McGee, *A Practical Approach to Measurement in Physical Education*, (Philadelphia: Lea and Febiger, 1964), p. 548.

[8] Karlin, *op. cit.* p. 1.

# CHAPTER II

## REVIEW OF LITERATURE

In recent years much attention has been directed to the topic of reading. There have been a great many opinions advanced as to how reading can best be improved. A multitude of studies have also attempted to shed light on this important problem. This review has attempted to separate the results of studies from opinions. It has been divided into two main topics, namely authoritative opinions and studies. The material under each of these headings has been further divided into sections which deal with perceptual-motor skills and coordination.

### I. OPINIONS ON PERCEPTUAL-MOTOR SKILLS AND COORDINATION

#### Perceptual-Motor Skills

Many children are coming into our schools lacking basic perceptual-motor skills. As a result of this, they are less able to participate in educational activities. These children become slow learners or underachievers. The early motor responses of the child, which are the earliest behavioral responses of the human organism, is the beginning of a long process of development and learning. Through these early motor explorations, the child finds out about himself and the world around him, and his motor experimentations and motor learnings become the foundations which knowledge is built upon.[1] In early childhood, mental and physical activities are closely related and motor activities play a major role in intellectual development.

Johnson, in his book, Education for the Slow Learners, further verifies the importance of motor skills in reading when he stated:

> Learning to read involves the development of certain motor skills. The initial skills that are required in this area are predominantly ocular. The child needs to learn to move his eyes from left to right; this should be established to some degree prior to the introduction of reading.[2]

Johnson further states that--other motor skills are also important to reading. These require relatively fine coordination that will be used after the initial reading stage. When reading from a book, it is necessary to move the eyes, accurately, from the end of one line to the beginning of the next. Upon completion of a page, the page must be turned, but just one at a time. A number of important motor skills must be developed by each individual who wants to become an efficient reader.

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[1]Newell C. Kephart, The Slow Learner in the Classroom, (Columbus, Ohio: Charles E. Merrill Books, Inc., 1960), p. 35.

[2]G. Orville Johnson, Education for the Slow Learner, (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1964), p. 199.

Bahr,[3] in his article "The Key to Learning" reports on the relationship of the mind and body. For man to reach his optimal mental ability he must have a sound, well-exercised body. This is, however, not a new idea, but instead a neglected one. A couple of thousand years ago the Greeks drummed up the motto: "A sound mind a sound body".

Gruber,[4] in his presentation at the American Association for the Advancement of Science reported that modern man is paying insufficient attention to the relationship between mind and body. After reviewing many physical education articles, he concluded that there is a relationship between physical conditioning and intellectual achievement.

Sherrington states the situation in this way:

> As we look along the scale of life, whether in time or in order of organization, muscle is there before mind, 'recognizable mind'. It would seem to be the motor act under 'urge-to-live' which has been the cradle of mind. The motor act, mechanically intergrating the individual, would seem to have started mind on its road to recognizability. The great collateral branch of life, the plants, despite all its variety and unexampled profusion of types, has never in any event developed an animal-like locomotory act, nor a muscle; nor a nerve; it has likewise remained without recognizable mind. As motor integration proceeds, mind proceeds with it, the servant of an 'urge' seeking satisfaction.[5]

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[3]Robert Bahr, "The Key to Learning", Fitness for Living, May-June 1969, p. 28.

[4]Ibid, p. 29. (As cited by Gruber)

[5]Sherrington, C., Man On His Nature, (Cambridge: Cambridge University Press, 1951), p. 169.

Hebb states in his book The Organization of Behavior:

> Mental life is motor life, the ultimate in mental ability is the result of the ultimate in motor ability.[6]

Coordination

Tynes says that research indicates that there is a correlation between eye-feet coordination and eye-brain coordination.[7] During physical education classes in Placentia, students are walking on balance boards, hopping, running, jumping, working on trampoline, bouncing balls and tumbling. Tynes[8] says these are not new concepts but rather a neglected area. Children who live in our rapidly growing cities do not get the experiences of walking on fences, railroad tracks or crossing a creek by walking on a fallen tree as do children of the rural areas.

A child must learn directions before he can learn to read. In our system of writing the child must know right and left direction before he can learn to read. The first direction to develop appears to be that of laterality, right and left.[9] The human organism is anatomically and neurologically designed to be an excellent right-left

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[6]D. O. Hebb, The Organization of Behavior, (New York: John Wiley and Sons, Inc., 1949), p. 107.

[7]Lowell A. Klappholz, ed. "Physical Coordination-A Key to Academic Learning", Physical Education Newsletter, Letter 12, Dec. 1, 1967. (As cited by Tynes.)

[8]Ibid.

[9]Kephart, op. cit., p. 42.

detector. Our body is bilaterally symmetrical. We have two eyes, two ears, two arms, two legs. When the child has developed laterality within his own organism and is aware of the right and left sides of his own body, he is ready to project directional concepts into external space. Experimenters in the field of child development have consistently noted that spatial relationships and spatial directions develop first in relation to the child himself and only later are objective relations developed between objects. Thus, early in his development a child locates two objects, each independently in relation to himself. This is called egocentric localization. One important factor in the development of directionality is the control of the eyes. When the child has learned this control, he matches the movement of his eye to the movement of his hand and thus transfers the directionality information from the kinesthetic pattern in his hand and arm to the kinesthetic pattern in his eye.[10]

The Public Schools in Westport, Connecticut after surveying their reading program launched a reading improvement program. Included in the early stages of the reading program were activities involving eye-hand coordination skills.[11]

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[10]Kephart, op. cit., p. 47.

[11]Jackson Head, ed., "A Top English Department Finds It Can Do Better", Grade Teacher, Volume 84, No. 7, March, 1967., p. 116.

## II. STUDIES ON PERCEPTUAL-MOTOR SKILLS

A study by McCormick, Schnobrich and others supports Kephart's views of the relationship between perceptual-motor skills and the ability to read. Forty-two underachieving grade one children matched for age, sex, IQ, and Lee-Clark reading grade level were randomly assigned to one of three groups. One group received perceptual-motor training, the second group received exercises from the regular physical education curriculum, and the third group served as a control group. After seven weeks of training, two periods a week, reading achievement was reassessed. The group that received perceptual-motor training was found to have made statistically significant gains, while the other two groups had not.[12]

Kagerer[13] in his longitudinal study of the relationship of perceptual performance in the early grades to reading level in the fourth grade, reported that there is a relationship between copying performance in the second and third grades and reading achievement in the fourth grade. The subjects, one hundred and thirty-four first graders, one

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[12]Clarence C. McCormick, Janice Nelson Schnobrich, S. Willard Footlik and Betty Poetker, "Improvement in Reading Achievement Through Perceptual-Motor Training", The Research Quarterly, Volume 39, Number 3, Oct., 1968.

[13]Rudolph L. Kagerer, The Relationship of Visual Perceptual Performance In Early Grades to Reading Level in Grade Four, (Winter Haven Lions Research Foundation Inc., 1960), p. 12.

hundred and thirty-nine second graders and one hundred and ten third graders were tested with the Perceptual Achievement Forms Test for perceptual performance. They were later rated for reading ability by use of a reading achievement test and teacher ratings when they were in the fourth grade. The study showed that the correlations computed between copying performance in the first grade and reading level in the fourth grade were not significant. The reason given for this low correlation was, that first grade childrens' drawings lay in the inadequate perceptual organization of children of that age group.

Psychologists in the Occupational Research Center at Purdue University concluded, after administering more than a million tests, that visual skill has a great deal to do with success on the job in industry. The researchers also found that nearly half the industrial population is visually handicapped. In 1953, Kephart conducted a study to find, (1) whether school children have as many visual limitations as industrial workers; and (2) whether the results of inadequate performance are caused by poor visual skills. In the study, optometrists and psychologists tested the visual skills of two thousand two hundred school children in grades three through twelve. The visual skills test scores were compared with actual achievement. Kephart discovered that: (1) about four out of every ten children have visual skills below the level required for good school work; (2) a direct relationship exists between visual skill and school performance; and (3) visual skills can be improved, and this improvement should lead to better school work.[14]

Lowder[15] in an attempt to verify Kephart's findings, conducted a study which tested the copying performance of one thousand five hundred and ten children of grades one, two, and three. The subjects were shown forms such as circles, crosses, squares and triangles and then instructed to make one like it. Each child's performance was rated and checked against school achievement. The results showed that visual skills are actually more closely related to school achievement than is the standard IQ, or intelligence test.

In a study conducted by Plack[16] to determine the relationship between achievement in reading and achievement in selected motor skills in elementary children, one hundred and seventy-two subjects from grades one, two and three in two elementary schools were tested. The Iowa Tests of Basic Skills were used to determine reading achievement and the Johnson Motor Achievement Battery was employed to measure

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[14]D. H. Radler with Newell C. Kephart, <u>Success Through Play</u>, (New York: Harper and Brothers, 1960), p. 14.

[15]Radler, <u>op</u>. <u>cit</u>., p. 14. (As cited by Lowder).

[16]Jeralyn J. Plack, "Relationship between achievement in reading and achievement in selected motor skills in elementary school children". <u>The Research Quarterly</u>, Vol. 39, No. 4, December, 1968.

achievement in selected motor skills. Plack concluded that there is a highly significant correlation between achievement in reading and the throw and catch test and achievement in reading and the zig-zag run test. Little or no consistent relationship existed between achievement in reading and the kicking test or the jump and reach test.

## III. SUMMARY

From research and observation, the bases of reading disabilities appear to stem from perceptual-motor coordination malfunctions within the child. Preventive and developmental measures for the improvement of reading ability is the concern of all educators. Studies indicate that physical educators can contribute toward the improvement of reading programs through the proper development of the child's perceptual-motor skills. Schools can, therefore, come closer to reaching their educational goals by providing a good physical education program.

# CHAPTER III

## METHODS AND PROCEDURES

The purpose of this study was to ascertain the degree of relationship which exists between eye-hand coordination and reading ability of third grade children.

A battery of three eye-hand coordination tests were administered to a group of fifty-two third grade children. The test scores were correlated with reading scores secured from the subjects' personal record at the school. All correlations were computed on the IBM 1401 series computer in the Data Processing Department at Kansas State Teachers College in Emporia, Kansas.

### I. SUBJECTS

The subjects were fifty-two third grade children from the Village School of Emporia, Kansas. Of this group, twenty-three were girls and twenty-nine were boys. The age range of the subjects was from eight years through ten years. This grade level was selected for this study because the investigator felt that at this grade level the two skills involved in this study should be well enough developed for the purpose of this study.

The subjects were dressed in their everyday attire for testing.

## II. TESTING PROCEDURES

### Preliminary Testing

Preliminary testing was conducted at Butcher School at Kansas State Teachers College in Emporia, Kansas. Because the testing devices were self-constructed, the researcher felt it was necessary to administer a preliminary test to determine how much time would be involved in the actual testing and to remedy all problems that might have been encountered in the actual testing.

### Actual Testing

The subjects were not notified about the testing until the day of the testing. The purpose for this was to eliminate practicing.

The pencil-maze test. The pencil-maze test was administered to the groups in the classroom by the researcher. There were no practice tests. The subjects were given instructions on testing procedures and the researcher demonstrated the test on the blackboard. The time limit for this test was one minute.

The ball toss test. The ball toss test was administered individually to the subjects. Two stations were set up in the school's gymnasium. The subjects were given two practice trials before starting the test. No time limit was set for this test.

The Marsden ball test. The Marsden ball test was administered individually to the subjects. Four stations were set up in the school's gymnasium. The subjects were given two practice trials before starting the test. No time limit was set for this test.

For the ball toss test and the Marsden ball test, the subjects were admitted four at a time, while the remainder of the group played games out on the playground under the supervision of an assistant. This procedure was taken to minimize "learning by watching".

## III. MEASURING DEVICES

The subjects were tested for eye-hand coordination with a battery of three tests and tested for reading ability with the Stanford Achievement Test.

### Eye-Hand Coordination

Three eye-hand coordination tests were devised and administered. These were: (1) The Marsden ball test, (2) a ball toss test, and (3) a pencil-maze test.

*The Marsden ball test.* The Marsden ball test was taken from a game suggested by Kephart.[1] The purpose of the game was to improve eye-hand coordination. A tennis ball hanging on a thirty-six inch string was suspended from the top of a doorway. The subject stood at arms

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[1] D. H. Radler with Newell C. Kephart, *Success Through Play*, (New York: Harper & Brothers, 1960), p. 101.

length from the hanging ball with the ball directly in front of him and flexed his elbow so that his hand was directly in front of his shoulder. The ball was swung across the front of the subject. (See diagram on page 18). He held a tongue depresser in his hand. The tester then held the ball so that the extended string was horizontal. The ball was always started from the subject's right side. When the investigator released it, the subject attempted to strike the swinging ball with the tongue depresser. He was only permitted to use a straight forward jabbing motion. The subject was given ten trials. One point was awarded for each success.

Ball toss test. Since catching is considered to be a good measure of eye-hand coordination,[2] a test involving this skill was constructed. In this test the subjects stood in a five foot circle. He held a tennis ball in one hand and a one-half gallon bleach bottle, which had had the bottom removed, in his other hand. The test required the subjects to toss the ball at least three feet higher than his head and catch it in the bottle. They were further required to stay within the circle while performing this task. Each subject was given ten trials. One point was awarded for each success. No score was given when the

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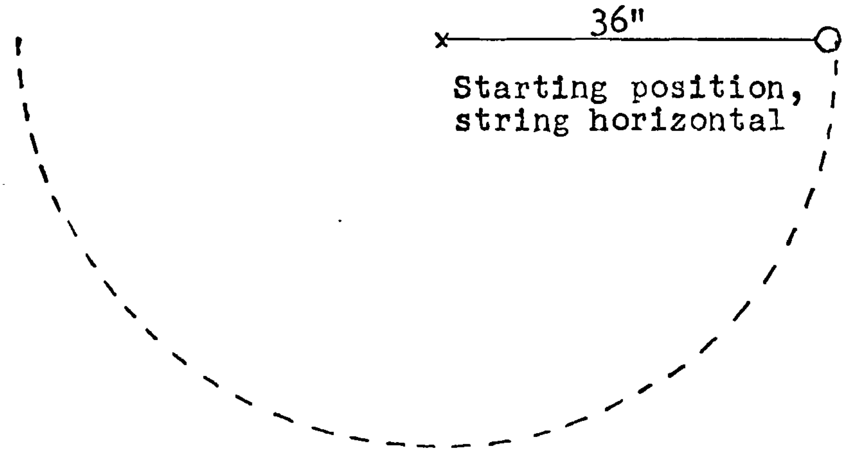
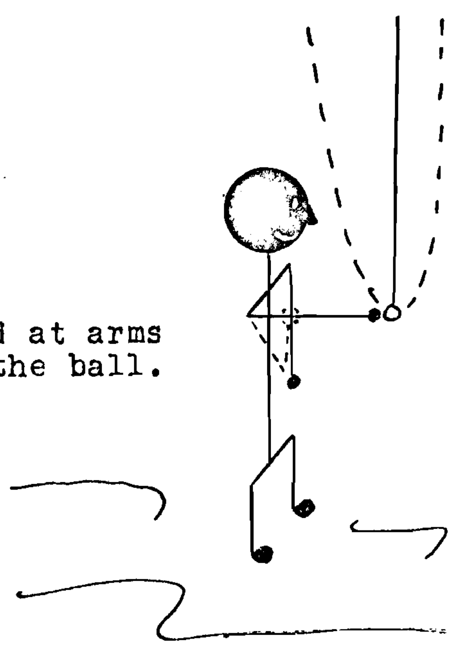
[2] Harold M. Barrow and Rosemary McGee, op. cit., p. 121.

Marsden Ball Test




Subject stood at arms length from the ball.



subject failed to catch the ball in the bottle.

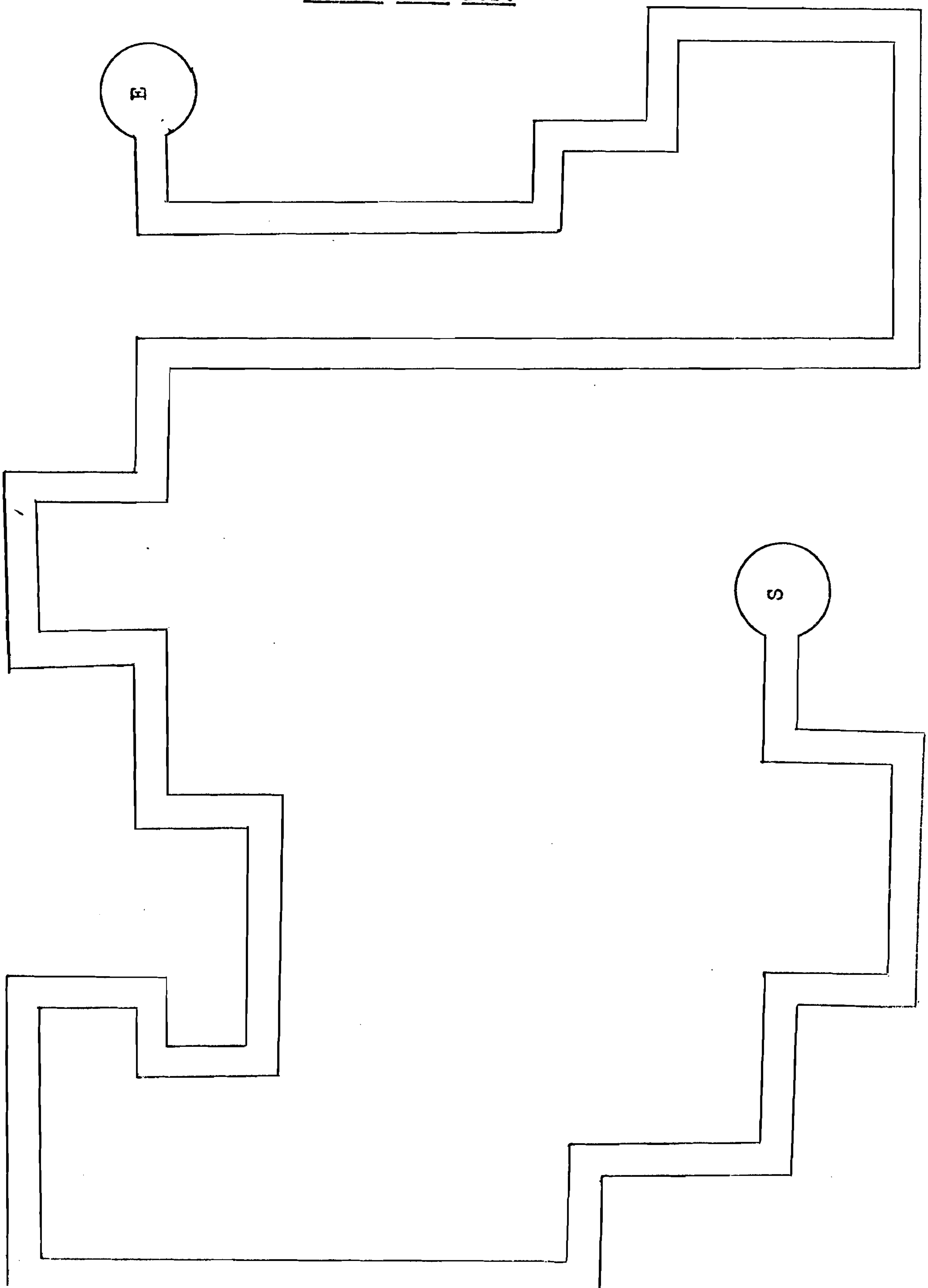
The pencil-maze test. The pencil-maze test used was a modification of the pencil-maze test used by psychologists to measure intelligence and coordination. (Constructed by the Lafayette Instrument Company, Lafayette, Indiana.) The original test included "blind alleys". These "blind alleys" were eliminated for this study because the researcher was mainly interested in coordination and not their learning ability. (See example on page 20).

The subjects were asked to trace a line through the maze without touching the side lines. The children were given one minute to complete the test. One point was deducted from the ten possible points each time the traced line touched or crossed the enclosing lines.

## Reading Ability

Stanford Achievement Test. The test used to determine the reading ability of the subjects was the reading section of the Stanford Achievement Test, Form W, Primary II. This test is divided into two sections. One section tests word meaning and the other section tests comprehension. This test had been administered in the spring of 1969 by the school personnel. The scores were secured from each subject's personal record.

# Pencil-Maze Test



## IV. TESTING ASSISTANTS

Selected students from the Kansas State Teachers College majoring in physical education were the testing assistants at the ball toss test and Marsden ball test stations. All assistants were given instructions on testing procedures prior to testing.

## V. EQUIPMENT AND FACILITIES

Pencil-Maze Test

1. pencil-maze test sheets
2. pencils for every student
3. desks to work on

Ball Toss Test

1. two one-half gallon plastic bleach bottles which had had the bottoms removed
2. two tennis balls
3. two five-feet diameter circles on the floor

Marsden Ball Test

1. four tennis balls attached to 36" strings
2. four tongue depressers

## VI. STATISTICAL PROCEDURE

The raw scores of all tests were converted into T-scale scores. These T-scale scores of the Marsden ball test, the ball toss test and the pencil-maze test were then added together to form a composite eye-hand coordination score.

The scores of the word meaning and paragraph meaning tests were averaged to get a reading score. This reading score was then added to the word meaning score and paragraph meaning score to arrive at a composite reading score.

With the addition of the composite raw score of the eye-hand coordination tests the researcher had nine variables to correlate. These were (1) the Marsden ball test, (2) the ball toss test, (3) the pencil-maze test, (4) the word meaning test, (5) the paragraph meaning test, (6) the eye-hand coordination raw score total, (7) the reading score, (8) the composite eye-hand coordination T-scale score, and (9) the composite reading T-scale score. These variables were cross-correlated by using the Pearson Product-Moment coefficient of correlation method.

All computations were done on the IBM 1401 series computer in the Data Processing Department at Kansas State Teachers College in Emporia, Kansas.

## CHAPTER IV

## ANALYSIS OF DATA

In this study of the relationship between eye-hand coordination and reading ability, the scores of fifty-two third grade children who participated in this study were correlated. To assist the investigator to find out whether there was a relationship between the two activities, it was necessary to use the statistical techniques of the Pearson Product-Moment correlation.[1] The researcher cross-correlated all variables used in this study. See Tables I, II, and III.

### I. CORRELATION OF EYE-HAND COORDINATION AND READING ABILITY FOR ALL SUBJECTS

Of the three eye-hand coordination tests administered, the ball toss test is the only test that had a positive relationship with all variables for all fifty-two children. The Marsden ball test correlated negatively with the pencil-maze test, word meaning, paragraph meaning, reading score and the composite reading T-scale score. The pencil-maze test correlated negatively with word meaning and reading score. The composite coordination T-scale score correlated positively with all variables. The results of these

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[1] Barrow, op. cit., p. 97.

correlations are shown on Table I, page 25. The correlation between the composite eye-hand coordination T-scale scores and the composite reading T-scale scores was .20 for all subjects. With 50 degrees of freedom, to be significant at the .05 level, a .27 was needed. This non-significant correlation then represents with this study that eye-hand coordination and reading ability are not significantly related.

## II. CORRELATION OF EYE-HAND COORDINATION AND READING ABILITY FOR ALL BOYS

For the boys, the correlations were: The ball toss test had a negative correlation with word meaning. The Marsden ball test correlated positively with all variables. The pencil-maze test correlated negatively with word meaning, paragraph meaning and reading score. See correlation on Table II, page 26. The correlation between the composite eye-hand coordination T-scale scores and the composite reading T-scale scores for the boys was -.03. With 27 degrees of freedom, to be significant at the .05 level, a .37 was necessary. This non-significant correlation then represents with this study that eye-hand coordination and reading ability are not related for the boys.

## III. CORRELATION OF EYE-HAND COORDINATION AND READING ABILITY FOR ALL GIRLS

For the girls, the correlations were: The ball toss

TABLE I

Correlation of all Subjects for all Variables

| | II | III | IV | V | VI | VII | VIII | IX |
|---|---|---|---|---|---|---|---|---|
| I | .09 | .10 | .01 | .14 | .09 | .70* | .56* | .15 |
| II | | -.05 | -.01 | -.02 | -.02 | .61* | .53* | -.01 |
| III | | | -.04 | .00 | -.02 | .49* | .56* | .05 |
| IV | | | | .75* | .92* | -.02 | .09 | .87* |
| V | | | | | .95* | .08 | .12 | .85* |
| VI | | | | | | .04 | .12 | .92* |
| VII | | | | | | | .91* | .11 |
| VIII | | | | | | | | .20 |

Significance: 50 degrees of freedom: .01 level - .35 *sign. at both levels
.05 level - .27 **sign. at .05 level

I - Ball toss test
II - Marsden ball test
III - Pencil-maze test
IV - Word meaning
V - Paragraph meaning
VI - Reading score
VII - Composite coordination raw score
VIII - Composite coordination T-scale score
IX - Composite reading T-scale score

NOTE: The Roman numerals correspond with the numerals in the table. Look down and across for correlations.

## TABLE II

### Correlation of Boys' Scores for all Variables

| | II | III | IV | V | VI | VII | VIII | IX |
|---|---|---|---|---|---|---|---|---|
| I | .10 | .46** | -.02 | .15 | .07 | .74* | .67* | .07 |
| II | | .01 | .02 | .07 | .05 | .60* | .60* | .10 |
| III | | | -.43 | -.24 | -.34 | .69* | .61* | .26 |
| IV | | | | .81* | .94* | -.20 | -.16 | .88* |
| V | | | | | .96* | .01 | .01 | .89* |
| VI | | | | | | -.10 | -.07 | .93* |
| VII | | | | | | | .93* | -.04 |
| VIII | | | | | | | | -.03 |

Significance: 27 degrees of freedom: .01 level - .47   *sign. at both levels.
.05 level - .37   **sign. at .05 level

I - Ball toss test
II - Marsden ball test
III - Pencil-maze test
IV - Word meaning
V - Paragraph meaning
VI - Reading score
VII - Composite coordination raw score
VIII - Composite coordination T-scale score
IX - Composite reading T-scale score

NOTE: The Roman numerals correspond with the numerals in the table. Look down and across for correlations.

test correlated negatively with word meaning. The Marsden ball test correlated negatively with the pencil-maze test, word meaning, paragraph meaning, reading score and the composite reading T-scale score. The pencil-maze test correlated positively with all variables. See correlations on Table III, page 28. The girls had a significant correlation of .60 between the composite eye-hand coordination T-scale scores and the composite reading T-scale scores. With 21 degrees of freedom, to be significant at the .05 level, a .41 was needed. At the .01 level a .53 was needed. This significant correlation then represents with this study that eye-hand coordination and reading ability are significantly related for girls.

## TABLE III

Correlation of Girls' Scores for all Variables

| | II | III | IV | V | VI | VII | VIII | IX |
|---|---|---|---|---|---|---|---|---|
| I | .04 | -.05 | .09 | .22 | .18 | .71* | .50** | .28 |
| II | | -.10 | -.06 | -.13 | -.10 | .61* | .45** | -.16 |
| III | | | .77* | .42** | .63* | .29 | .61* | .67* |
| IV | | | | .62* | .87* | .33 | .57* | .85* |
| V | | | | | .93* | .24 | .33 | .79* |
| VI | | | | | | .31 | .48** | .91* |
| VII | | | | | | | .87* | .36 |
| VIII | | | | | | | | .60* |

Significance: 21 degrees of freedom: .01 level - .53 *sign. at both levels
.05 level - .41 **sign. at .05 level

I - Ball toss test
II - Marsden ball test
III - Pencil-maze test
IV - Word meaning
V - Paragraph meaning
VI - Reading score
VII - Composite coordination raw score
VIII - Composite coordination T-scale score
IX - Composite reading T-scale score

NOTE: The Roman numerals correspond with the numerals in the table. Look down and across for correlations.

# CHAPTER V

## SUMMARY, CONCLUSIONS, FINDINGS AND RECOMMENDATIONS

### I. SUMMARY

The purpose of this study was to ascertain whether there is a relationship between eye-hand coordination and reading ability in third grade children. To obtain this goal, a study was designed to test the eye-hand coordination and the reading ability of fifty-two boys and girls in the third grade at the Village School in Emporia, Kansas. The children were tested with three eye-hand coordination tests. These test scores were correlated with reading scores on file at the school.

### II. FINDINGS

Within the limitations of this study the findings are as follows:

1. There is a positive non-significant correlation between eye-hand coordination and reading ability of .20 for the fifty-two third grade boys and girls.

2. When the reading ability and the eye-hand coordination were correlated a .60 correlation was found for the girls in the third grade.

3. When the reading ability and the eye-hand coordination were correlated a -.03 correlation was found for the boys in the third grade.

## III. CONCLUSIONS

Within the confines of this study the following conclusions seem justified:

1. There was no relationship between reading ability and eye-hand coordination in third grade boys.

2. There was a positive relationship between reading ability and eye-hand coordination in third grade girls.

## IV. RECOMMENDATIONS FOR FURTHER STUDY

1. A study might be conducted to investigate the relationship between eye-hand coordination and reading ability at different ages for male and female.

2. A study might be conducted to investigate the relationship between total body coordination and reading ability.

3. A study might be conducted with the third grade group using perfected game skills to determine reading ability and eye-hand coordination.

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# APPENDIX

Boys Eye-Hand Coordination Scores

| Student | Ball Toss Test | | Marsden Ball Test | | Pencil-Maze Test | | Composite Coordination Raw Scores | Composite Coordination T-scale scores |
|---|---|---|---|---|---|---|---|---|
| | RS | TS | RS | TS | RS | TS | | |
| 1. | 8 | 54.0 | 3 | 43.4 | 7 | 48.5 | 18 | 145.4 |
| 2. | 9 | 62.0 | 7 | 56.1 | 9 | 59.4 | 25 | 177.5 |
| 3. | 6 | 46.5 | 5 | 49.0 | 8 | 55.0 | 19 | 150.0 |
| 4. | 6 | 46.5 | 1 | 32.3 | 3 | 34.3 | 10 | 113.1 |
| 5. | 10 | 83.0 | 6 | 50.5 | 8 | 55.0 | 24 | 188.5 |
| 6. | 10 | 83.0 | 9 | 67.7 | 8 | 55.0 | 27 | 205.7 |
| 7. | 8 | 54.0 | 3 | 42.4 | 9 | 59.4 | 20 | 155.8 |
| 8. | 7 | 50.0 | 3 | 42.4 | 9 | 59.4 | 19 | 151.8 |
| 9. | 8 | 54.0 | 5 | 49.0 | 7 | 48.5 | 20 | 151.5 |
| 10. | 3 | 39.8 | 4 | 46.0 | 3 | 34.3 | 10 | 120.1 |
| 11. | 9 | 62.0 | 8 | 61.0 | 10 | 83.0 | 27 | 206.0 |
| 12. | 8 | 54.0 | 4 | 46.0 | 10 | 83.0 | 22 | 183.0 |
| 13. | 7 | 50.0 | 3 | 42.4 | 6 | 43.3 | 16 | 135.7 |
| 14. | 9 | 62.0 | 7 | 56.1 | 7 | 48.5 | 23 | 166.6 |

RS-raw score TS-T-scale score

Boys Eye-Hand Coordination Scores (cont.)

| Student | Ball Toss Test | | Marsden Ball Test | | Pencil-Maze Test | | Composite Coordination Raw Scores | Composite Coordination T-scale scores |
|---|---|---|---|---|---|---|---|---|
| | RS | TS | RS | TS | RS | TS | | |
| 15. | 9 | 62.0 | 5 | 49.0 | 7 | 48.5 | 21 | 159.5 |
| 16. | 4 | 42.0 | 5 | 49.0 | 4 | 37.0 | 13 | 128.6 |
| 17. | 10 | 83.0 | 7 | 56.1 | 8 | 55.0 | 25 | 194.1 |
| 18. | 8 | 54.0 | 6 | 50.5 | 8 | 55.0 | 22 | 159.5 |
| 19. | 4 | 42.6 | 10 | 83.0 | 6 | 43.3 | 20 | 168.9 |
| 20. | 3 | 39.8 | 9 | 67.7 | 5 | 39.0 | 17 | 146.0 |
| 21. | 6 | 46.5 | 7 | 56.1 | 6 | 43.3 | 19 | 145.9 |
| 22. | 9 | 62.0 | 7 | 56.1 | 7 | 48.5 | 23 | 166.6 |
| 23. | 8 | 54.0 | 9 | 67.7 | 8 | 55.0 | 25 | 176.7 |
| 24. | 10 | 83.0 | 10 | 83.0 | -3 | 29.2 | 17 | 195.2 |
| 25. | 9 | 62.0 | 7 | 56.1 | 5 | 39.0 | 21 | 157.1 |
| 26. | 10 | 83.0 | 3 | 42.4 | 9 | 59.4 | 22 | 184.8 |
| 27. | 9 | 62.0 | 7 | 56.1 | 6 | 43.3 | 22 | 161.4 |
| 28. | 7 | 50.0 | 4 | 46.0 | 6 | 43.3 | 17 | 139.3 |
| 29. | 7 | 50.0 | 8 | 61.0 | 10 | 83.0 | 25 | 194.0 |

Girls Eye-Hand Coordination Scores

| Student | Ball Toss Test | | Marsden Ball Test | | Pencil-Maze Test | | Composite Coordination Raw Scores | Composite Coordination T- Scale Scores |
|---|---|---|---|---|---|---|---|---|
| | RS | TS | RS | TS | RS | TS | | |
| 1. | 4 | 42.6 | 3 | 42.4 | 10 | 83.0 | 17 | 168.0 |
| 2. | 6 | 46.5 | 2 | 35.7 | 8 | 55.0 | 16 | 137.2 |
| 3. | 3 | 39.8 | 7 | 56.1 | 7 | 48.5 | 17 | 144.4 |
| 4. | 7 | 50.0 | 7 | 56.1 | 10 | 83.0 | 24 | 189.1 |
| 5. | 7 | 50.0 | 8 | 61.0 | 6 | 43.3 | 21 | 154.3 |
| 6. | 6 | 46.5 | 4 | 46.0 | 8 | 55.0 | 18 | 147.5 |
| 7. | 9 | 62.0 | 8 | 61.0 | 7 | 48.5 | 24 | 171.5 |
| 8. | 3 | 39.8 | 5 | 49.0 | 10 | 83.0 | 18 | 171.8 |
| 9. | 2 | 32.3 | 8 | 61.0 | 10 | 83.0 | 20 | .76.3 |
| 10. | 9 | 62.0 | 6 | 50.5 | 8 | 55.0 | 23 | 167.5 |
| 11. | 8 | 54.0 | 3 | 42.4 | 9 | 59.4 | 20 | 155.8 |
| 12. | 4 | 42.6 | 2 | 35.7 | 7 | 48.5 | 13 | 126.8 |
| 13. | 6 | 46.5 | 4 | 46.0 | 8 | 55.0 | 18 | 147.5 |
| 14. | 3 | 39.8 | 4 | 46.0 | 7 | 59.4 | 16 | 145.2 |

RS-raw score TS-T-scale score

Girls Eye-Hand Coordination Scores (cont.)

| Student | Ball Toss Test | | Marsden Ball Test | | Pencil-Maze Test | | Composite Coordination Raw Scores | Composite Coordination T-Scale Scores |
|---|---|---|---|---|---|---|---|---|
| | RS | TS | RS | TS | RS | TS | | |
| 15. | 8 | 54.0 | 1 | 32.3 | 10 | 83.0 | 19 | 169.3 |
| 16. | 9 | 62.0 | 4 | 35.7 | 4 | 37.0 | 17 | 134.7 |
| 17. | 9 | 62.0 | 7 | 56.1 | 9 | 59.4 | 25 | 177.5 |
| 18. | 0 | 29.2 | 8 | 61.0 | 7 | 48.5 | 15 | 138.7 |
| 19. | 5 | 43.3 | 8 | 61.0 | 8 | 55.0 | 21 | 159.3 |
| 20. | 10 | 83.0 | 7 | 56.1 | 10 | 83.0 | 27 | 222.1 |
| 21. | 7 | 50.0 | 9 | 67.7 | 8 | 55.0 | 24 | 172.7 |
| 22. | 3 | 39.8 | 5 | 49.0 | 7 | 48.5 | 15 | 137.3 |
| 23. | 9 | 62.0 | 9 | 67.7 | 8 | 55.0 | 26 | 184.7 |

Boys Reading Scores

| Student | Word Meaning | | Paragraph Meaning | | Reading Scores | | Composite Reading T-scale Scores |
|---|---|---|---|---|---|---|---|
| | RS | TS | RS | TS | RS | TS | |
| 1. | 23 | 43.9 | 48 | 56.7 | 35 | 49.0 | 149.6 |
| 2. | 21 | 43.9 | 40 | 42.4 | 30 | 39.0 | 125.3 |
| 3. | 15 | 35.7 | 37 | 37.0 | 26 | 35.7 | 108.4 |
| 4. | 32 | 61.0 | 43 | 46.5 | 37 | 56.7 | 164.2 |
| 5. | 27 | 52.4 | 47 | 56.7 | 37 | 56.7 | 165.8 |
| 6. | 30 | 61.0 | 54 | 67.7 | 42 | 62.0 | 190.7 |
| 7. | 12 | 34.4 | 28 | 34.3 | 20 | 34.3 | 102.9 |
| 8. | 30 | 61.0 | 46 | 51.0 | 38 | 56.7 | 168.7 |
| 9. | 34 | 85.0 | 47 | 56.7 | 40 | 62.0 | 201.7 |
| 10. | 31 | 61.0 | 46 | 51.0 | 38 | 56.7 | 168.7 |
| 11. | 20 | 38.0 | 39 | 42.4 | 29 | 39.0 | 119.4 |
| 12. | 27 | 52.4 | 49 | 56.7 | 38 | 56.7 | 165.8 |
| 13. | 23 | 43.9 | 39 | 42.4 | 31 | 43.9 | 130.2 |
| 14. | 34 | 83.0 | 54 | 67.7 | 44 | 83.0 | 233.7 |

RS-raw score TS-T-scale score

Boys Reading Scores (cont.)

| Student | Word Meaning | | Paragraph Meaning | | Reading Scores | | Composite Reading T-scale Scores |
|---|---|---|---|---|---|---|---|
| | RS | TS | RS | TS | RS | TS | |
| 15. | 25 | 46.0 | 42 | 46.5 | 33 | 43.9 | 136.4 |
| 16. | 32 | 61.0 | 54 | 67.7 | 43 | 83.0 | 211.7 |
| 17. | 32 | 61.0 | 58 | 83.0 | 45 | 83.0 | 227.0 |
| 18. | 29 | 52.4 | 42 | 46.5 | 35 | 49.0 | 147.9 |
| 19. | 33 | 83.0 | 42 | 46.5 | 37 | 56.7 | 186.2 |
| 20. | 24 | 46.0 | 44 | 51.0 | 34 | 49.0 | 146.0 |
| 21. | 31 | 61.0 | 47 | 56.7 | 39 | 56.7 | 174.4 |
| 22. | 33 | 83.0 | 56 | 83.0 | 44 | 83.0 | 249.0 |
| 23. | 23 | 43.9 | 46 | 51.0 | 34 | 49.0 | 143.9 |
| 24. | 29 | 52.4 | 46 | 51.0 | 37 | 56.7 | 160.1 |
| 25. | 22 | 43.9 | 38 | 42.4 | 30 | 39.0 | 125.3 |
| 26. | 30 | 61.0 | 46 | 51.0 | 38 | 56.7 | 168.7 |
| 27. | 32 | 61.0 | 47 | 56.7 | 39 | 56.7 | 174.4 |
| 28. | 28 | 52.4 | 49 | 56.7 | 38 | 56.7 | 165.8 |
| 29. | 12 | 34.3 | 24 | 29.2 | 18 | 29.2 | 92.7 |

## Girls Reading Scores

| Student | Word Meaning | | Paragraph Meaning | | Reading Scores | | Composite Reading T-scale Scores |
|---|---|---|---|---|---|---|---|
| | RS | TS | RS | TS | RS | TS | |
| 1. | 35 | 83.0 | 40 | 46.5 | 37 | 56.7 | 186.2 |
| 2. | 23 | 43.9 | 40 | 46.5 | 31 | 43.9 | 134.3 |
| 3. | 23 | 43.9 | 49 | 56.7 | 36 | 49.0 | 149.6 |
| 4. | 28 | 52.4 | 44 | 51.0 | 36 | 49.0 | 152.4 |
| 5. | 14 | 34.3 | 28 | 34.3 | 21 | 34.3 | 102.9 |
| 6. | 27 | 52.4 | 43 | 46.5 | 35 | 49.0 | 147.9 |
| 7. | 26 | 46.0 | 41 | 46.5 | 33 | 43.9 | 136.4 |
| 8. | 28 | 52.4 | 43 | 46.5 | 35 | 49.0 | 147.9 |
| 9. | 30 | 61.0 | 51 | 59.4 | 40 | 62.0 | 182.4 |
| 10. | 27 | 52.4 | 44 | 51.0 | 35 | 49.0 | 152.4 |
| 11. | 28 | 52.4 | 53 | 67.7 | 40 | 62.0 | 182.1 |
| 12. | 24 | 46.0 | 48 | 56.7 | 36 | 49.0 | 151.7 |
| 13. | 30 | 61.0 | 53 | 67.7 | 41 | 62.0 | 190.7 |
| 14. | 28 | 52.4 | 49 | 56.7 | 38 | 56.7 | 165.8 |

RS-raw score TS-T-scale score

Girls Reading Scores (cont.)

| Student | Word Meaning | | Paragraph Meaning | | Reading Scores | | Composite Reading T-scale Scores |
|---|---|---|---|---|---|---|---|
| | RS | TS | RS | TS | RS | TS | |
| 15. | 34 | 83.0 | 54 | 67.7 | 44 | 83.0 | 233.7 |
| 16. | 20 | 38.0 | 44 | 51.0 | 32 | 43.9 | 132.9 |
| 17. | 32 | 61.0 | 51 | 59.4 | 41 | 62.0 | 182.4 |
| 18. | 27 | 52.4 | 37 | 37.0 | 32 | 43.9 | 133.3 |
| 19. | 31 | 61.0 | 37 | 56.7 | 39 | 56.7 | 174.4 |
| 20. | 33 | 83.0 | 53 | 67.7 | 43 | 83.0 | 233.7 |
| 21. | 28 | 52.4 | 51 | 59.4 | 39 | 56.7 | 168.5 |
| 22. | 21 | 43.9 | 43 | 46.5 | 32 | 43.9 | 134.3 |
| 23. | 30 | 61.0 | 50 | 59.4 | 40 | 62.0 | 182.4 |