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Measurement of recall with and without text.

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THESIS

Measurement of Recall
With and Without Text

Submitted by
Florence Marie Kelley

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First Reader: Donald D. Durrell, Professor of Education
Second Reader: Helen Blair Sullivan, Professor of Education
MEASUREMENT OF RECALL

WITH AND WITHOUT TEXT
Acknowledgement

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CHAPTER I

INTRODUCTION

Problem

It is the purpose of this study to measure the difference in amount and accuracy of recall obtained from material read only once and material allowed to remain before the child while comprehension checks are being answered.

Introduction and Review of Previous Study

We can readily see the need in our daily living for children and adults to have the ability to comprehend material effectively after one reading. In the performance of one's daily tasks time is not available for rereading. No person who finds it necessary to read material more than once can be considered as efficient in the performance of his duties when reading is involved, as the person who can read once with effective comprehension.

When reading for pleasure, interest soon dulls and reading becomes a tedious chore when one must reread in order to comprehend. When reading novels, stories which appear in several installments in current magazines, or any lengthy material which necessitates interruption of the reading, efficient recall is of prime importance.

McKee\(^1\) states that "Reading offers unlimited possibilities as a means of enriching and extending one's vicarious experiences". He also cites

the importance of reading in promoting intelligent citizenship. "True democracy assumes that the people are informed concerning the affairs of the nation and that they will think and act judiciously. Consequently the wide assimilation of important information is imperative."

Strang² says of the importance of recall, "A truly efficient reader comprehends what he reads, remembers what he has comprehended, and makes use of what he remembers."

Krathwohl³ expresses the importance of reading and reading skills as follows. "There is no question about the usefulness in daily life of reading skills. Not only do adults spend a great deal of time reading but children acquire the inheritance of civilization mostly by this means. To cut in half the time required to read books, magazines or newspapers is to release valuable hours either for more reading or for other activities. On the other hand, to read books, magazines or newspapers and not to know what has been read is to use up time which might better be put to other purposes. The student with good reading skills not only does better work but probably has more time to do more and better work."

Horn⁴ speaks of the importance of helping children to locate what is important, to appraise, to organize ideas, to retain and use what is read.

³ Krathwohl, William. "Improvement of Acquired Reading Skills" National Elementary Principal 25:30-33; February 1946
Gray\textsuperscript{5} emphasizes as one major type of skill to be taught in the intermediate grades, the ability to select and evaluate materials needed to solve a problem. Among the components of this skill he lists both the ability to remember the problem while reading and the ability to read discriminately from various sources. In order that the latter ability may be effective it is certainly necessary to have the ability to recall material previously read from various sources.

A study by Peterson\textsuperscript{6} substantiated the value of recall but indicated that the amount of time required for reading which would result in effective retention must be taken into account.

It appears from some investigations that poor memory of material read may be correlated with general efficiency in reading, in comprehension and in rate. In an experiment conducted by Book\textsuperscript{7}, "the fact that after studying a specific assignment, only 27\% of the college men and 39\% of the women could give the title of the assignment, indicated not only poor memory but inefficient study habits."

As a result of his experiment, Young\textsuperscript{8} has the following to say concerning the provision for recall in the school program. "If the factor

\textsuperscript{5}Gray, William S. "The Teaching of Reading" The Thirty-Sixth Yearbook of the National Society for the Study of Education, 1937; Part I:117.
\textsuperscript{6}Peterson, H.A. "Recitation of Recall as a Factor in the Learning of Long Prose Selections" Journal of Educational Psychology 35:220-228; April 1944.
\textsuperscript{7}Book, William F. "How Well College Students Can Read" School and Society 26:242-248; August 20, 1927.
\textsuperscript{8}Young, William E. The Relationship of Reading Comprehension and Retention; Doctorate Thesis, State University of Iowa, 1930.
of previous knowledge can be eliminated and a true picture of the effectiveness of each mode secured, it would point plainly to the conclusion that one presentation is not enough for learning. The educational implication here is that the school must provide definitely for retention on the part of the child. Many writers on the subject of reading have failed to include memory or retention as one of the reading skills."

Recognizing the importance of recall and retention of material read as an important reading skill it follows that a valid measure of the power of recall is most necessary. Since the future use of material read depends upon the ability of the reader to recall what he has read, it is important that the teacher have some measure of this skill in order to evaluate the effectiveness of her teaching and the growth of the pupil in this ability.

Concerning standard tests, Durrell9 has the following to say: "Unless a child is shown an analysis of his various abilities, word ability, recall abilities, speeded skills, and thinking skills, he is unable to help himself. Most of these abilities do not appear on standard tests".

Davis states that "The skill that is measured most adequately by the reading tests now in use is knowledge of word meaning. Almost every reading test contains at least one section of vocabulary items. Furthermore, the types of questions based on the passages read are usually such as to demand little more of the testee than the ability to match words in the passage

9Durrell, Donald D. "Increasing the Effectiveness of Voluntary Reading" Harvard Educational Review 9:307-315; May 1939

10Davis, Fred B. "Two New Measures of Reading Ability" Journal of Educational Psychology 33:371; May 1942
with words in the items. This means that word knowledge is the principle component of reading ability as it is measured by most reading tests."

Although the importance of developing the powers of recall is recognized by many authorities in the field of reading, and the importance of a valid measure of this skill is also recognized, there have not been many studies directly relating to this problem.

Spitzer\textsuperscript{11} made a study which consisted of measuring recall by multiple choice test questions. He found immediate recall to be an effective method of retaining learning.

The conclusion that there is a high relationship existing between intelligence and immediate recall was stated by Watson\textsuperscript{12} in his study. He found that there was a greater degree of relationship between intelligence and delayed recall. This relationship increased as the time of the period of delay lengthened.

Courtney\textsuperscript{13} compared the relative value of measuring recall in the form of answers to multiple choice questions and in the form of essay reproduction. The findings showed that multiple choice recall was greater than essay type recall and that this difference was twice as great as the recall

\textsuperscript{11}Spitzer, Hubert F. "Studies in Retention" \textit{Journal of Educational Psychology} 30:641-656; December 1939.

\textsuperscript{12}Watson, R.I. "Relationship Between Intelligence and the Retention of Course Material in Psychology" \textit{Journal of Educational Psychology} 30:265-279; April 1939.

obtained from essay reproduction.

Duffy\textsuperscript{14} states that among the types of errors found which should be given attention in a remedial program and the individual differences for which teaching should provide were aided recall and unaided recall.

In a study by Myers\textsuperscript{15} in which he measured recall in relation to retention, the findings indicated that immediate recall obtained in the form of written reproduction was beneficial to later reproduction of a list of unrelated words.

A comparison of aided and unaided recall was made by McGeoch and Whitley\textsuperscript{16}. They tested college sophomores on their observation of Binet object cards. Half of the subjects were asked to recall what they had seen in written narrative form and the other half recalled in the form of answers to questions. Findings showed that recall was greater when measured by answers to questions than when measured by narrative.

The study by Bucknam\textsuperscript{17} confirms the findings that multiple choice recall is considerably easier than unaided recall, either written or oral. These findings emphasized the need for measuring fluency of oral and written

\textsuperscript{14} Duffy, Gertrude B. \textit{A Diagnostic Study of Reading Difficulty in a Third Grade}; Ed. M. Thesis, Boston University School of Education, 1935.

\textsuperscript{15} Myers, G. C. "Recall in Relation to Retention" \textit{Journal of Educational Psychology} 5:123; March 1914.


\textsuperscript{17} Bucknam, Margaret E. \textit{A Comparison of the Fluency of Oral Recall in Silent Reading}; Ed. M. Thesis, Boston University School of Education, 1941
recall in analyzing reading ability of pupils. They also show a possible reason for pupil failure in verbal subjects even though the reading test score indicates high comprehension.

Dietz concluded that a single reading of factual material was of almost no value in terms of retention after a delay period. This corroborates Yoakam's study which was based on a comparison of identification and recall. This test was concerned with information acquired by a single reading and was tested by a multiple choice test and a question and answer type test. The effect of a single reading appeared negligible after a delay period.

A study by Germane showed that recall from one reading was decidedly less than recall from rereading several times.

A similar conclusion was reached by Good who found superiority in recall of two readings over recall of one reading. However, he did


Yoakam, Gerald A. Reading and Study; Macmillan Co., New York, 1929.


question the value of the two readings when considered in the light of the additional time necessary for rereading.

Gates\textsuperscript{22} shares this opinion when he states that much of the time spent in rereading short selections could be spent to greater advantage in other ways by elementary school pupils.

Howe\textsuperscript{23} presented the Iowa Silent Reading Test to 158 fifth grade children, testing with the material remaining before the pupil and with the material not before the child. The results of this study showed that there was no difference between recall of material read only once and recall of material constantly before the pupil.


\textsuperscript{23}Howe, Elizabeth \textit{Measurement of Recall With and Without Text}; Ed. M. Thesis, Boston University, 1943
CHAPTER II

DESCRIPTION OF THE STUDY

Selection of Material

For the purpose of this experiment, the measurement of recall with and without text, three forms, A, B, and C of the Nelson Silent Reading Test were used. These tests are designed to serve as a measure of the reading ability of pupils in Grades III to IX inclusive. Three forms of the test are available. These are identical in difficulty and construction, each consisting of a vocabulary test and a paragraph test. The Vocabulary Test consists of one hundred words in five-response type, while the Paragraph Test consists of twenty-five paragraphs, each followed by three questions concerning the content of the paragraph, the question being in the four-response form. The Paragraph test, which was used for the experimental part of the study, measures three phases of reading ability as follows:

1. Ability to understand the general significance of a paragraph.
2. Ability to note details.
3. Ability to predict the probable outcome.

Two distinctive features of the Paragraph Test are: (a) questions measuring each of the three phases of ability are based on the same paragraph, hence each ability is measured by the same instrument; and (b) the three types of questions appear in varying order, so that any particular

"mind-set" is avoided, thus presenting a natural reading situation.

A copy of Form A of the test, as well as the teacher's manual and directions for administering, may be found in the Appendix.

The Nelson Silent Reading Test was selected for this experiment for several reasons, one of them being the length of the paragraphs. It was desirable to have the longest selections possible for this study. Many of the standard reading tests examined had paragraphs considerably shorter than the Nelson Silent Reading Test.

It was decided that three forms of the test be given in order to obtain the reading level of the subjects from one form given in its entirety and to have both experimental parts of the study as much alike as possible with regard to motivation. The test is printed in booklet form with the Vocabulary Test appearing on one side of the page while the Paragraph Test is on the reverse side of the test. In order to have the experimental paragraphs mounted, each on a separate card, with its comprehension check, it was necessary to cut through the Vocabulary Test. This fact necessitated the giving of a third form so that the reading level might be obtained.

Subjects of the Study

This experiment was performed during the first week in June on 196 fifth grade children in a community located twenty-five miles from Boston. This community is a manufacturing center with a mixed population of 101,000. The majority of children in the group come from families of an average socio-economic status while there are a few with better than average circumstances and a few with below average circumstances.

Figure 1, on the following page, shows the chronological age dis-
FIGURE I

DISTRIBUTION OF CHRONOLOGICAL AGES FOR 196 FIFTH GRADE PUPILS

Range = 9 yrs. 3 mos. to 13 yrs. 5 mos.
Mean = 10 yrs. 9 mos.
tribution of the 196 children tested. The range is four years, two months, including ages from nine years, three months to thirteen years, five months. The mean chronological age is ten years, nine months. The figures are taken as of June 1, 1952.

Figure 2, following, shows the distribution of reading grades for this group of 196 fifth grade children. The range is six years, four months. This includes reading grades from third grade, third month to the ninth grade, eighth month. The mean reading grade is fifth grade, ninth month. These reading grades were obtained from Form A of the Nelson Silent Reading Test which was given in its entirety.

This group of 196 children is approximately average in chronological age and also in reading ability for fifth grade.

Method of Presentation

To obtain the reading achievement level of each of the subjects, Form A of the Nelson Silent Reading Test was given in its entirety. The directions for this form were given exactly as printed in the Manual accompanying the tests. Since this test is one of the Clapp-Young Self-Marking Tests\(^1\) with a separate answer sheet, the giving of Form A prior to the experimental parts afforded the pupils an opportunity to become familiar with the manner in which the answers were to be marked. It was felt that this should avoid any possible affect on the scores which might ordinarily result if one of the experimental forms was given first to be followed by the

---

FIGURE II

DISTRIBUTION OF READING GRADES FOR 196 FIFTH GRADE PUPILS

Range = Grade 3, 3rd. month to Grade 9, 7th month

Mean = Grade 5, 9th. month

Reading Grades

NUMBER OF PUPILS
other experimental form for which the pupils would already have had practice.

Form B was used for one part of the experiment. The paragraphs were cut from the test booklet and mounted on cards with the comprehension check appearing beside the paragraph just as printed in the original test. Since the Nelson test is a Self-Marking test it was necessary to cut the answer sheet and attach the corresponding answer blanks to each card on the same side with the paragraph and comprehension check questions. Since all the necessary information concerning each pupil had already been furnished in the appropriate blanks in Form A of the test, only the pupil's name was necessary with Form B. Each pupil was furnished with an envelope on which he was instructed to write his name. The envelope was already marked with the letter B in the upper left hand corner. At the end of the test the pupils were asked to put the elastic around the pack of cards and put the cards in the envelope. In order to score the test it was necessary to detach the answer blanks which had been stapled to the cards. After scoring the blanks were placed in the envelope again to be kept for future reference. The directions for administering Form B were written to be as near like those given in the Manual as possible.

Form C was used for the second part of the experiment. The paragraphs were cut from the test booklet and mounted on cards with the comprehension check appearing on the reverse side of the card. The corresponding answer blanks were attached to the cards on the same side with the comprehension check. These cards were then placed in packs of twenty-five ranging from one to twenty-five. A plain card with the letter C in the upper left hand corner was placed on top of the pack and an elastic was put
around the pack. Once again each pupil was furnished with an envelope this time with the letter C on it. The pupil was asked to write his name on the envelope which was used in the same manner as in Form B.

Below are the directions for administering Form B. Since the steps for Form C are very similar only part of the directions for Form C will be presented here.

DIRECTIONS FOR ADMINISTERING
FORM B

1. Distribute the envelopes to each pupil. Have the pupil write his name on the envelope. This is the ONLY time the pupil is to write his name.

2. Distribute the packages of paragraphs and have the pupils place them on their desks with the "B" in the upper left hand corner. Instruct them to leave the elastic band on the pack until they are given specific directions to remove it.

3. Distribute the sample paragraph to the pupils. Ask them to place it face down on the desk until you tell them to turn it over. Explain that this is a sample paragraph and does not count in the test but it is done in exactly the same way as the paragraphs in the test. Explain also that this is the only time they will be permitted to ask questions concerning the procedure of the test.

4. When each pupil has a sample paragraph, the examiner will say: "Now we will all turn the paragraph over so that the paragraph is on the left. Beside the paragraph you will see questions about the paragraph. To the right of the questions you will see the answer strip stapled onto the card. You will make crosses in these boxes denoting the right answer."
In the actual testing for this study, the directions for administering were very complete. The exact wording to be used by the examiner was furnished. In all there were ten steps given in the directions. For the purpose of this report some of these steps will be omitted, such as posting the door with signs, supplying the pupil with two pencils, allowing no erasers to be on the desks due to the fact that the self-marking test cannot be erased, using the same time limit of 20 minutes for the two experimental parts and instructions of that nature.

5. Before the elastics are removed from the packs, demonstrate with a pack just how to do it. Show the children that they are to take the plain "B" slip off and lay it aside. When you give the signal to begin, they are to read the first paragraph, read the questions following and complete the answer strip just as they did the sample, putting it aside as soon as it is finished. They are to go right on to the next paragraph, repeating this performance until they have done all of the paragraphs or until you say "Stop". 20 minutes is the time limit for the paragraph test.

DIRECTIONS FOR ADMINISTERING

FORM C

The only major difference in the two sets of directions is in the fifth step, which is presented below.

5. Tell the children that once they have read the paragraph and turned over to the answer side, they may not look back at the paragraph to find the answer. They are allowed to read the paragraph only once, as this is a study to determine the difference in recall when the material is not
available to the child during the comprehension checks. It would be well for the examiner to watch carefully during the test to see that no one looks back at the paragraph.

Throughout this study the terms "memory" and "text" are used, the former referring to Form C, the latter to Form B.

Form A was used to obtain the achievement level of the subjects, thus where the word "achievement" is used it denotes the use of Form A of the Nelson Silent Reading Test.

These tests were given in the early part of the morning on three different days during the first week of June.
CHAPTER III
ANALYSIS OF DATA

The data were analyzed to determine the comparison between:

1. Total recall obtained from memory and text.
2. Recall of the main idea in memory and text.
3. Recall of details in memory and text.
4. Amount of material read in memory and text.
5. Thirty-four superior readers in memory and text.
6. Thirty-four poor readers in memory and text.
7. Superiority of text over memory for thirty-four superior readers and thirty-four poor readers.

The data were further analyzed to determine the correlation between:

1. Reading achievement and recall in memory.
2. Reading achievement and recall in text.
3. High achievement with recall in memory.
4. High achievement with recall in text.
5. Low achievement with recall in memory.
6. Low achievement with recall in text.
7. Amount of material read with recall in memory.
8. Amount of material read with recall in text.
The data for Comparisons 1 to 3 inclusive are based on raw scores. The data for Comparison 4 are based on the actual number of paragraphs read. The data for Comparisons 5, 6, and 7 are based on raw scores, the reading level of the subjects having been obtained by converting raw scores to grade equivalents as supplied in the teacher's manual for the Nelson Silent Reading Test.

The data used in Correlations 1 to 6 inclusive are calculated from raw scores while that used in correlations 7 and 8 are calculated from the number of paragraphs read and raw scores. All correlations were calculated according to the Pearson Product Moment Method.
TABLE I

Comparison of Total Recall in Memory and Text

<table>
<thead>
<tr>
<th>Test</th>
<th>No. Cases</th>
<th>Mean</th>
<th>S.D. Mean</th>
<th>Diff. Mean</th>
<th>S.D. diff.</th>
<th>Critical Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory</td>
<td>196</td>
<td>36.44</td>
<td>10.37</td>
<td>2.20</td>
<td>.467</td>
<td>4.72</td>
</tr>
<tr>
<td>Text</td>
<td>196</td>
<td>38.64</td>
<td>11.38</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The mean score for the memory test was 36.44 as compared to 38.64 for the text. The difference between the means was 2.20 in favor of the text.

The critical ratio was 4.72 indicating that there are 99.99 chances in 100 that the difference is statistically significant. Further interpretation shows that this difference is of great statistical importance.
TABLE II
Comparison of Recall of Main Idea in Memory and Text

<table>
<thead>
<tr>
<th>Test</th>
<th>No. Cases</th>
<th>Mean</th>
<th>S.D. Mean</th>
<th>Diff. Mean</th>
<th>S.D. Diff.</th>
<th>Critical Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory</td>
<td>196</td>
<td>13.04</td>
<td>3.81</td>
<td>.02</td>
<td>.2</td>
<td>.1</td>
</tr>
<tr>
<td>Text</td>
<td>196</td>
<td>13.06</td>
<td>4.03</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The mean score for the recall of the main idea in the test was 13.04 as compared to 13.06 for the text. The difference was .02 in favor of the text.

The critical ratio was 0.1 indicating that there are 4 chances in 100 that this difference is statistically significant. Further interpretation indicates that this difference is of no statistical importance.
TABLE III

Comparison of Recall of Details in Memory and Text

<table>
<thead>
<tr>
<th>Test</th>
<th>No. Cases</th>
<th>Mean</th>
<th>S.D. Mean</th>
<th>Diff. Mean</th>
<th>S.D. Diff</th>
<th>Critical Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory</td>
<td>196</td>
<td>10.53</td>
<td>3.27</td>
<td>2.05</td>
<td>.19</td>
<td>10.8</td>
</tr>
<tr>
<td>Text</td>
<td>196</td>
<td>12.48</td>
<td>3.76</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

The mean score for the recall of details in the memory test was 10.53 as compared to 12.58 for the text. The difference was 2.05 in favor of the text.

The critical ratio was 10.8 indicating that there are 99.99 chances in 100 that the difference is statistically significant. Further interpretation shows that this difference between the means is of great statistical importance.
TABLE IV

Comparison of Amount of Material Read in Memory and Text

<table>
<thead>
<tr>
<th>Test</th>
<th>No. Cases</th>
<th>Mean</th>
<th>S.D. Mean</th>
<th>Diff. Mean</th>
<th>S.D. Diff.</th>
<th>Critical Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory</td>
<td>196</td>
<td>15.84</td>
<td>4.06</td>
<td>0.41</td>
<td>0.20</td>
<td>2.05</td>
</tr>
<tr>
<td>Text</td>
<td>196</td>
<td>15.43</td>
<td>4.40</td>
<td></td>
<td></td>
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</tbody>
</table>

The mean number of selections read in the memory test was 15.84 as compared to 15.43 for the text. The difference was 0.41 in favor of the memory test.

The critical ratio was 2.05 indicating that there are 90 chances in 100 that the difference is statistically significant. Further interpretation shows that this difference between the means is of no statistical importance.
FIGURE III

DISTRIBUTION OF READING GRADES FOR 34 SUPERIOR FIFTH GRADE READERS

Range = Grade 8, 1st. month to Grade 9, 7th. month

Mean = Grade 8, 8th. month.
### TABLE V

Comparison of 34 Superior Readers in Memory and Text

<table>
<thead>
<tr>
<th>Test</th>
<th>No. Cases</th>
<th>Mean</th>
<th>S.D. Mean</th>
<th>Diff. Mean</th>
<th>S.D. Diff.</th>
<th>Critical Ratio</th>
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<tbody>
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<td>Memory</td>
<td>34</td>
<td>50.44</td>
<td>7.38</td>
<td>2.18</td>
<td>0.976</td>
<td>2.24</td>
</tr>
<tr>
<td>Text</td>
<td>34</td>
<td>52.62</td>
<td>8.46</td>
<td></td>
<td></td>
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</tbody>
</table>

The mean scores obtained by these superior readers in the memory test was 50.44 as compared to 52.62 in the text. The difference was 2.18 in favor of the text.

The critical ratio was 2.24 indicating that there are 97 chances in 100 that the difference is statistically significant. Further interpretation shows that this difference may be of statistical importance.
FIGURE IV

DISTRIBUTION OF READING GRADES FOR 34 POOR READERS

Range = Grade 3, 3rd. month to Grade 4, 9th. month

Mean = Grade 4, 3rd. month
TABLE VI

Comparison of 34 Poor Readers in Memory and Text

<table>
<thead>
<tr>
<th>Test</th>
<th>No. Cases</th>
<th>Mean</th>
<th>S.D. Mean</th>
<th>Diff. Mean</th>
<th>S.D. Diff.</th>
<th>Critical Ratio</th>
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<tr>
<td>Memory</td>
<td>34</td>
<td>24.44</td>
<td>5.61</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Text</td>
<td>34</td>
<td>26.09</td>
<td>6.48</td>
<td>1.65</td>
<td>0.985</td>
<td>1.68</td>
</tr>
</tbody>
</table>

The mean score obtained by these poor readers in the memory test was 24.44 as compared to 26.09 in the text. The difference between the means was 1.65 in favor of the text.

The critical ratio of 1.68 indicates that there are 90 chances in 100 that the difference is statistically significant. Further interpretation shows that this difference between the means is of no statistical importance.
TABLE VII

Comparison of Superiority of Text over Memory
for Good and Poor Readers

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Superior Readers</td>
<td>34</td>
<td>2.18</td>
<td>0.976</td>
<td>0.53</td>
<td>1.39</td>
<td>0.382</td>
</tr>
<tr>
<td>Poor Readers</td>
<td>34</td>
<td>1.65</td>
<td>0.985</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The mean difference between memory and text for the 34 superior readers was 2.18 as compared with a mean difference of 1.65 for the same number of poor readers. The difference between these two means was 0.53 in favor of the superior readers.

The critical ratio was 0.382 indicating that there are 30 chances in 100 that this difference is statistically significant. Further interpretation shows that this difference between the means is of no statistical importance.
### TABLE OF CORRELATIONS*

<table>
<thead>
<tr>
<th>FACTORS</th>
<th>r</th>
<th>S.E. of r</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reading Achievement with Raw Scores in Memory</td>
<td>0.822</td>
<td>0.0157</td>
</tr>
<tr>
<td>2. Reading Achievement with Raw Scores in Text</td>
<td>0.797</td>
<td>0.0176</td>
</tr>
<tr>
<td>3. High Achievement with Memory</td>
<td>0.582</td>
<td>0.0418</td>
</tr>
<tr>
<td>4. High Achievement with Text</td>
<td>0.460</td>
<td>0.0900</td>
</tr>
<tr>
<td>5. Low Achievement with Memory</td>
<td>0.330</td>
<td>0.1030</td>
</tr>
<tr>
<td>6. Low Achievement with Text</td>
<td>0.365</td>
<td>0.1000</td>
</tr>
<tr>
<td>7. Amount of Material Read with Memory</td>
<td>0.778</td>
<td>0.0190</td>
</tr>
<tr>
<td>8. Amount of Material Read with Text</td>
<td>0.768</td>
<td>0.0198</td>
</tr>
</tbody>
</table>

*All correlations for this study were calculated by the Pearson Product Moment Method.*
Relationship of Reading Achievement with Recall in Memory

\[ r = .822 \quad \text{S.E. of } r = .0157 \]

A high positive correlation of .822 is statistically significant indicating that reading achievement is closely related with recall in memory.

Relationship of Reading Achievement with Recall in Text

\[ r = .797 \quad \text{S.E. of } r = .0176 \]

A high positive correlation of .797 shows that the scores in the text are very closely related to reading achievement.
Relationship of High Reading Achievement with Memory
for 34 Superior Readers

\[ r = .582 \quad \text{S.E. of } r = .0418 \]

The correlation coefficient of .582 shows a significant relationship between high achievement in reading and scores in the memory test.

Relationship of High Reading Achievement with Text
for 34 Superior Readers

\[ r = .460 \quad \text{S.E. of } r = .0900 \]

A rather low correlation of .460 indicates that the superior pupil's reading achievement level does not very closely parallel his score in the text test.

Considering both of the above relationships whose difference is .122, it becomes evident that the superior pupil's reading achievement correlates more closely with his score in the memory test than with his score in the text.
Relationship of Low Reading Achievement with Memory
for 34 Poor Readers

\[ r = .330 \quad \text{S.E. of } r = .1030 \]

.330 is a low correlation of no statistical importance showing that there is only a very minor relationship between the reading achievement level of poor readers and their scores in the memory test.

---

Relationship of Low Reading Achievement with Memory
for 34 Poor Readers

\[ r = .365 \quad \text{S.E. of } r = .1000 \]

.365 is a low correlation of no statistical importance showing that there is only a minor relationship between the reading achievement level of poor readers and their scores in the text.

---

Considering the above relationships we note that there is a difference of only .035 denoting that there is no significant difference in the poor reader's scores in the memory test and text test.
Relationship of Amount of Material Read
with Memory

\[ r = 0.778 \quad \text{S.E. of } r = 0.0190 \]

The high correlation of 0.778 indicates a close parallel between the number of selections the pupil read and his score in the memory test.

---

Relationship of Amount of Material Read
with Text

\[ r = 0.768 \quad \text{S.E. of } r = 0.0198 \]

0.768 is a high correlation denoting a definite proximity in the number of paragraphs read by the pupil and his score in the text.

---

In considering these two correlations it is found that there is a difference of only 0.010 which is of no statistical significance. This would imply that the pupil's scores in both the memory test and the text were dependent upon the number of paragraphs read, as would seem the most logical.
CHAPTER IV

SUMMARY AND CONCLUSIONS

Summary

The purpose of this study was to measure the difference in amount and accuracy of recall obtained from material read only once and material allowed to remain before the child while comprehension checks are being answered. The term "memory" was used to refer to that part of the experiment in which the child was permitted only one reading of the material which was then turned over so that it was not available to him during the comprehension checks. The term "text" was used to refer to that part of the experiment in which the material remained before the child constantly, thus permitting an unlimited number of readings. The term "achievement" was used to refer to the reading grade level of the subjects and this was obtained by giving Form A of the Nelson Standard Reading Test unaltered and in its entirety. The subjects of the study were 196 fifth grade children who were tested with each of the three forms.

Comparisons were noted between total recall from memory and total recall from text, recall of main ideas and recall of details, amount of material read, and superiority of text over memory for poor readers and for superior readers. The relationships were determined between reading achievement and recall in memory and text, high and low achievement with recall in memory and text and amount of material read with recall in memory and text.
Conclusions

The conclusions drawn from the analysis in Chapter III may be stated as follows:

1. The difference between total recall from memory and total recall from text is statistically significant in favor of the text.

2. The difference of .02 in favor of the text with recall of the main idea is so slight as to be of no significance.

3. The critical ratio of the difference between the amount of recall in details was 10.8 and is definitely of statistical importance in favor of the text.

4. The difference between the amount of material read in the memory and in the text is of no importance.

5. In the comparison of 34 superior readers in memory and text the critical ratio was 2.24 indicating that the difference in favor of the text may be of statistical importance.

6. In the comparison of 34 poor readers in memory and text the critical ratio was 1.68 which indicates nothing of importance concerning the difference between memory and text.

7. The comparison of superiority of text over memory for good readers and poor readers shows that the difference is negligible.

8. There is a correlation of .822 between reading achievement and memory. This is considered high.

9. The correlation of reading achievement with raw scores in text was .797 which is also high.
10. The correlation of .582 shows a significant relationship between high achievement and scores in the memory test.

11. The relationship between the superior pupil's reading achievement and his text scores is very slight as is shown by the correlation of .460.

12. Poor readers show almost no relationship between their reading achievement level and their scores in the text test and memory test as well.

13. The amount of material read closely parallels the pupils' scores in memory and text, with correlations of .776 and .768 respectively.
CHAPTER V

SUGGESTIONS FOR FURTHER STUDY

1. Perform the same type of experiment but delay the recall over a specified length of time.

2. Perform the same type of experiment but remove all time elements.

3. Perform the same type of experiment with children on other grade levels.

4. Perform the same type of experiment with material of a narrative nature.

5. Perform the same type of experiment on a group which is retarded in reaching achievement.
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THE NELSON SILENT READING TEST
Vocabulary and Paragraph
For Grades 3 to 9 — Form A

By M. J. Nelson, Ph.D., Dean of the Faculty, Iowa State Teachers College, Cedar Falls, Iowa

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To be used with a special Answer Booklet

SAMPLE EXERCISES

1. John is the name of a 1 school, 2 girl, 3 river, 4 boy, 5 flower......................... 1

   Note: Which word tells the answer? What is the number of this word? "John" is the name of a "boy," — so "boy" is the answer. The number of this word is "4." To show that you think "boy" is the answer, make a mark like this × in the square that has "4" in it. Read the next two questions and mark your answer in the same way.

2. Bread is something to 1 wear, 2 play with, 3 write on, 4 eat, 5 work with.................. 2

3. A dog is 1 a rock, 2 a plant, 3 a tool, 4 a person, 5 an animal.......................... 3
21. The author of a recent article concerning the celebrated race between the hare and the tortoise insists that the tortoise won the race because of the slogan, “Hard shell and hard living,” which the friends of the tortoise adopted as their battle cry, and not because of any superiority of the tortoise himself. He then goes on to explain that the reason this version of the story is not widely known is that very few of those who witnessed the race survived the great forest fire which occurred shortly after. It came up suddenly one night when there was a strong wind. The hare and the tortoise and a very few of the beasts saw it from a great distance from a high, bare hill at the edge of the forest, and they hurriedly called a meeting to decide what messenger they should send to warn the beasts in the forest. It was finally decided to send the tortoise.

22. Wilbur recalled the old fable that a wild beast cannot stand the gaze of the human eye, and he stood at the edge of the clearing gazing steadily at the wildcat. But the snarls only grew louder. He did not like the looks of it at all. On the other hand, he had not the slightest intention of going back to camp without water. Wilbur advanced into the clearing, deciding that whether the creature moved or not, he would now be so near that he couldn’t miss her with the revolver. When he was very close, she snarled more fiercely and crouched ready to spring.

23. The voyages of discovery by explorers from England, Spain, and Portugal gave to each of those countries valid claims to territory in the New World. In 1524, Francis I of France resolved to have his share in these discoveries and in the benefits which might result from them. “What!” said he to his courtiers, “shall the kings of Spain and Portugal divide all America between them, without suffering me to take a share as their brother? I would fain see the article in Adam’s will that bequeaths that vast inheritance to them.”

24. Priest, monk, and prelate stood aghast,
As through the pageant the heathen passed.
A cross-bearer out of his satchle he flung,
Laid his hand on the pommel and into it sprung.
Loud was the shriek and deep the groan
When the holy sign on the earth was thrown!
The fierce old count unsheathed his brand,
But the calmer prelate stayed his hand.
“Let him pass free! — Heaven knows its hour —
But he must own repentance’s power,
Pray and weep, and penance bear,
Ere he hold land by the Tyne and the Wear.”

25. Durovitich had a very strange sort of eccentricity: he was disinclined to recapitulate any incident he had formerly related. If asked to do so, he would interpolate so as to make the original impossible of recognition. Yet so garrulous was he that on more than one occasion did he take so little cognizance of the words which flowed over his tongue in his efforts to regale his select coterie, that his hearers were able to worm from him essential repetitions. Such was the case one bitter winter evening when, recovering from an inordinate carousel, the village jokemaster was desirous of hearing a tale which Durovitich, himself a bit befuddled, had once produced out of his copious stock. Durovitich fixated the most timid of his hearers with that ghoulish gaze, which one who would be regaled must learn to forbear, and the assembled company knew that the jokemaster had met with success.

End of all the tests. Wait for directions.
VOCABULARY TEST

1. Gray is the name of a 1 fruit, 2 color, 3 house, 4 rock, 5 sign............................ 1
2. Most dogs can 1 fly, 2 bark, 3 talk, 4 shoot, 5 sew......................................... 2
3. A rabbit is an 1 apple, 2 oak, 3 office, 4 animal, 5 orange.............................. 3
4. June is the name of a 1 day, 2 week, 3 year, 4 month, 5 boy............................ 4
5. Silk is something to 1 wear, 2 eat, 3 sing, 4 burn, 5 fish.................................. 5
6. Speakers often stand upon the 1 zone, 2 roof, 3 trunk, 4 beach, 5 stage............ 6
7. Fuel is something to 1 burn, 2 reduce, 3 sew, 4 strike, 5 serve.......................... 7
8. Men often eat 1 spoons, 2 ants, 3 eggs, 4 miles, 5 stain................................... 8
9. One sometimes sits on a 1 bench, 2 shade, 3 file, 4 belt, 5 soda........................ 9
10. A banker often works with 1 stages, 2 boards, 3 checks, 4 saws, 5 lead........... 10
11. One may lie down on a 1 drill, 2 tear, 3 pencil, 4 top, 5 sofa............................. 11
12. A garment is to 1 watch, 2 wear, 3 carry, 4 trace, 5 learn................................. 12
13. A season is a part of a 1 bridge, 2 dairy, 3 sentence, 4 surface, 5 year............. 13
14. To roar means to make a 1 mistake, 2 boat, 3 hook, 4 noise, 5 meal..................... 14
15. A gift is a 1 need, 2 list, 3 trade, 4 present, 5 pound...................................... 15
16. To dread is to 1 begin, 2 remove, 3 scratch, 4 fear, 5 fail................................ 16
17. An expert does his work 1 badly, 2 noisily, 3 poorly, 4 well, 5 seldom............... 17
18. A mighty person is 1 small, 2 weak, 3 lame, 4 strong, 5 simple.......................... 18
19. A hare is a small 1 chest, 2 shipment, 3 animal, 4 pitcher, 5 base...................... 19
20. A colt is kept in the 1 cradle, 2 shadow, 3 post-office, 4 stable, 5 factory........... 20
21. One often spends a vacation at the 1 office, 2 temple, 3 corner, 4 court, 5 beach. 21
22. Workers receive 1 launches, 2 ships, 3 hospitals, 4 wages, 5 levels.................... 22
23. The officer wore a 1 chain, 2 uniform, 3 bracelet, 4 blouse, 5 sash.................... 23
24. A ranch is a large 1 garden, 2 farm, 3 roll, 4 tool, 5 circus............................. 24
25. Scarlet is the name of a 1 sense, 2 manufacturer, 3 color, 4 treasure, 5 food....... 25
26. A boss is a 1 player, 2 pearl, 3 brute, 4 rule, 5 master.................................... 26
27. To blush means to turn 1 white, 2 around, 3 dead, 4 sick, 5 red.......................... 27
28. The sleet made the pavement 1 wide, 2 secure, 3 crowded, 4 slippery 5 delightful.. 28
29. To charm means to 1 lean, 2 bruise, 3 delight, 4 earn, 5 lack............................. 29
30. A calm person is 1 rough, 2 quiet, 3 jealous, 4 strict, 5 prompt.......................... 30
31. A model is a 1 dairy, 2 strike, 3 pattern, 4 reply, 5 chum................................ 31
32. To recover means to 1 turn, 2 lead, 3 press, 4 inspect, 5 regain.......................... 32
33. Granite is a kind of 1 partner, 2 flower, 3 league, 4 rock, 5 route..................... 33
34. A wrap is used to 1 strike, 2 instruct, 3 taste, 4 wear, 5 select............................ 34

Go right on with the next page.
17. After the furious storm of the night before, the day had cleared and the sun shone upon a fresh world. Tom and Jack, laden with dripping willow branches, hurried along through the wet meadow to the little creek in its center. Today the creek was swollen from the recent rain and it gurgled along over the rocks and had nearly covered the stepping stones which had at one time projected about two feet from the water. Tom tried to cross, but as the stones were wet and smooth, he slipped and fell in. Of course, the water was not deep enough to do him any harm, but as the current was swift, he called to the much excited Jack for help.

18. The night was an inky blackness and Joe Thomas was able to find his way only by flashes of light furnished by exploding bombs and shells. Joe was hastening to the spot from which had just come the anguished cry of his wounded comrade, Harry. Though his own leg was pierced and he was in no condition to care for himself, much less to care for his stricken comrade, he pressed forward, crawling by fits and starts as each new flare made it possible for him to find his way. Joe and Harry had been friends in their home town and the dangers of war had served to draw them closer together. It would never do for Joe to let Harry stay there alone now. Just a few more feet and he would be at his side. He called to him, for he was within speaking distance, and told him to wait for just a few minutes.

19. I was sitting on the edge of the bed, loosening the heel of one of my rubber boots with the toe of the other preparatory to an early retirement, when suddenly through the darkness and stillness of the sleeping town, from the power-house half a mile away came a low and rising note — the great siren whistle in the power-house. Almost fascinated, I listened as the great note rose higher and more shrill and died away again. One blast meant a fire in the town; two blasts, fire in the buildings at the mine; and three blasts, the most terrible of all, a disaster or trouble in the mine. Once more, after what seemed to be a long pause, the sound came again; and once more rose and died away. I did not move, but there was a sudden coldness that came over me as once more, for the third time, the deep note broke out on the quiet air.

20. Mexico, you will remember, was built upon an island in Lake Tezcuco. There are five great lakes in the Mexican valley; four of them are fresh and the fifth, Tezcuco, is salt. All the other lakes are at a higher elevation than the salt lake, and three of them higher than the city itself, even at the present day. And so it happens that, whenever a great rain occurs, and the higher lakes are flooded, the waters rush down into Lake Tezcuco, which has no outlet, and sometimes overflow the city. The first of these deluges, of which we have any mention, occurred in the year 1446. Montezuma and the Mexicans were greatly distressed by this great flood, which rose so high that all the streets were filled and the people compelled to go about in canoes.
VOCABULARY TEST (Continued)

35. Alcohol is a kind of 1 epidemic, 2 coloring, 3 liquid, 4 zero, 5 bureau

36. To tour is to make a 1 promise, 2 dwelling, 3 journey, 4 foundation, 5 success.

37. To afford may mean to 1 relate, 2 furnish, 3 assure, 4 observe, 5 desire

38. Strict means 1 vacant, 2 severe, 3 recent, 4 homely, 5 comical

39. A base is at the 1 top, 2 bottom, 3 side, 4 roof, 5 capital.

40. A mason works with 1 fruit, 2 ivory, 3 paper, 4 stone, 5 poultry.

41. To proceed is to 1 prospect, 2 include, 3 continue, 4 destroy, 5 assist.

42. To imagine is to have a 1 privilege, 2 license, 3 council, 4 vision, 5 schedule.

43. Method refers to 1 facts, 2 position, 3 system, 4 justice, 5 volume.

44. The pamphlet was made by the 1 lawyer, 2 grocery, 3 butcher, 4 publisher, 5 dentist.

45. A suburb is a part of a 1 paragraph, 2 hospital, 3 creamery, 4 city, 5 drama.

46. The traveler reached his 1 destination, 2 obligation, 3 comment, 4 expectation, 5 memorial.

47. Evident means 1 frozen, 2 granted, 3 united, 4 tired, 5 plain.

48. To investigate means to make 1 apology, 2 discount, 3 sacrifice, 4 remittance, 5 inquiry.

49. Flannel is a kind of 1 rock, 2 cloth, 3 music, 4 dirt, 5 hardware.

50. Rural refers to 1 kindness, 2 value, 3 defect, 4 retail, 5 country.

51. An exposition is a public 1 privilege, 2 exhibit, 3 obligation, 4 executive, 5 opinion.

52. An unfortunate event is sometimes a 1 willow, 2 promenade, 3 circuit, 4 disaster, 5 sacrifice.

53. A felon is a 1 tramp, 2 juvenile, 3 keeper, 4 follower, 5 criminal.

54. When fruit matures it becomes 1 spoiled, 2 worse, 3 green, 4 poisoned, 5 ripe.

55. Mental refers to the 1 program, 2 family, 3 topic, 4 mind, 5 wealth.

56. A corporation is a business 1 guarantee, 2 obligation, 3 official, 4 organization, 5 exhibition.

57. A client is one who consults an 1 assistant, 2 expert, 3 analysis, 4 acquaintance, 5 assembly.

58. Juniper is a 1 fern, 2 tree, 3 vine, 4 goat, 5 weed.

59. An ogre is a 1 fish, 2 demon, 3 deserter, 4 heathen, 5 conductor.

60. A legal act is 1 wrong, 2 noisy, 3 lawful, 4 formal, 5 useful.

61. An inexhaustible supply is one that cannot be 1 burned, 2 uncovered, 3 used up, 4 found, 5 opened.

62. A cymbal is used in 1 gardening, 2 surgery, 3 painting, 4 sculpture, 5 music.

63. Moderate means 1 careless, 2 assured, 3 favored, 4 limited, 5 compared.

64. Leisure means freedom from 1 supervision, 2 requirements, 3 ambition, 4 occupation, 5 disgust.

65. A metropolitan person is 1 city-minded, 2 cultured, 3 rural-minded, 4 severe, 5 polite.

66. A rampart is a 1 ramrod, 2 tower, 3 ditch, 4 barrier, 5 dungeon.

Go right on with the next page.
11. The boatmen moved slowly up the pathway, each painful, weary step bringing them nearer to their destination. The boat with its huge load was a great burden and the two lines were shifted at frequent intervals from shoulder to shoulder. Despite the weariness of the group, they suddenly began to sing. The clear tones of beautiful “Volga Boatman” floated out into the air, causing those who were passing by to pause and listen. As the workers continued their song, the boat finally came to shore and the men were not slow to cast off the tow lines.

12. We were received very cordially, the squaw spreading for us a buffalo robe. Soon we were surrounded by curious Indians who wished to see us. The big pipe of peace having been passed, a lively conversation followed, after which we were led to different parts of the village. Wherever we stopped, the young squaws offered us more meat and the entertainer’s pipe was very frequently passed. A storm that had been threatening for several hours now began in earnest.

13. As he glanced up, he noticed that the stars were invisible. Then he realized that Stan had pulled on the stick and they were climbing in an effort to get above the thick banks of mist. Higher and higher they mounted, and when Jack could see the stars again, although all was a gray void below, he breathed more easily. He could now see by the stars that they were headed right, and, although he knew Stan could keep to their course by his compass, he welcomed the additional guidance of the Big Dipper. After several hours the mists suddenly cleared, the sun arose in the east, and Jack’s home town appeared lying directly below them.

14. The boatmen moved slowly up the pathway, each painful, weary step bringing them nearer to their destination. The boat with its huge load was a great burden and the two lines were shifted at frequent intervals from shoulder to shoulder. Despite the weariness of the group, they suddenly began to sing. The clear tones of beautiful “Volga Boatman” floated out into the air, causing those who were passing by to pause and listen. As the workers continued their song, the boat finally came to shore and the men were not slow to cast off the tow lines.

15. At a National Nominating Convention the delegates of one party get together to nominate candidates for President and Vice-President. The delegates from each state group themselves around their banner. Bands play popular airs. The sections greet party heroes with prolonged cheering. Every one is enthusiastic. There is much noise and agitation pervading the entire crowd. At some time during the meeting a ballot is taken to see which of those nominated is to be the presidential candidate of that party. Sometimes no person receives enough votes in the first ballot to be elected as candidate.

16. Smith, first witness for the state, testified that while he was driving at twenty-five miles per hour the defendant passed him like a flash, on the wrong side of the street. He was so surprised that he watched the car until it collided with another at a crossing two blocks ahead, and turned over. Patrolman Jones, for the state, testified that when he arrived, there was trace of a broken bottle in the wrecked car and a strong smell of alcohol about the defendant, who was unconscious. Perry, driver of the other wrecked car, testified that on seeing the defendant approach, he had drawn over to the curb but could not avoid the swaying car of the defendant.

Go right on with the next page.
67. The turret of a ship is its 1 tower, 2 range, 3 sails, 4 stem, 5 prow.

68. To mangle is to 1 mend, 2 mix, 3 crush, 4 disdain, 5 weave.

69. Inveterate hatred is 1 unknown, 2 deep-rooted, 3 inherited, 4 brilliant, 5 sensible.

70. A highly decorative work is 1 respectable, 2 elaborate, 3 impossible, 4 immense, 5 permanent.

71. Essential means 1 successful, 2 necessary, 3 practical, 4 sanitary, 5 universal.

72. Idolatry involves 1 worship, 2 masonry, 3 laziness, 4 thieving, 5 preaching.

73. To interpose means to 1 write, 2 intrude, 3 weaken, 4 remain fixed, 5 secede.

74. One who is craven is 1 cowardly, 2 insane, 3 black, 4 bird-like, 5 greedy.

75. An insolent person is 1 scheming, 2 bankrupt, 3 haughty, 4 dishonest, 5 heedless.

76. An arrogant person is one who is 1 haughty, 2 wealthy, 3 subdued, 4 unsuccessful, 5 arrested.

77. To warrant means to 1 appreciate, 2 separate, 3 imagine, 4 deserve, 5 register.

78. An epistle is a 1 specialty, 2 lantern, 3 communication, 4 sacrifice, 5 comedy.

79. Graduates of an institution are called 1 semesters, 2 principals, 3 alumni, 4 chaperones, 5 socialists.

80. An incompetent person is 1 young, 2 selfish, 3 unable, 4 stingy, 5 boastful.

81. A cowl is generally worn by a 1 mason, 2 miner, 3 woman, 4 boy, 5 monk.

82. Dissension involves 1 freedom, 2 forgiveness, 3 flight, 4 discord, 5 harmony.

83. One who is discreet is 1 deceitful, 2 ambitious, 3 prudent, 4 sincere, 5 greedy.

84. Preliminary is that which is 1 homelike, 2 necessary, 3 preparatory, 4 impossible, 5 satisfactory.

85. An illiterate person is 1 unwary, 2 unskillful, 3 unwise, 4 unschooled, 5 unobserved.

86. To consecrate is to 1 publish, 2 proclaim, 3 hallow, 4 free, 5 pardon.

87. A man of perseverance is 1 low-bred, 2 yielding, 3 antagonistic, 4 trained, 5 steadfast.

88. Omnipotent means 1 all-powerful, 2 intolerant, 3 forgiving, 4 all-wise, 5 harmonious.

89. An ominous cloud is 1 high, 2 fleecy, 3 black, 4 threatening, 5 stationary.

90. A tendril is part of a 1 game, 2 joint, 3 plant, 4 muscle, 5 tent.

91. An indictment is a 1 charge, 2 statute, 3 commission, 4 warning, 5 proclamation.

92. Alabaster is a variety of 1 plant, 2 rock, 3 color, 4 religious token, 5 sea-weed.

93. Affluent means 1 poor, 2 abusive, 3 sincere, 4 profane, 5 abundant.

94. A caustic remark is one which is 1 flattering, 2 sharp, 3 pleasing, 4 subdued, 5 inadequate.

95. Sufficient means 1 practical, 2 sanitary, 3 attractive, 4 adequate, 5 profitable.

96. Ecstasy generally refers to excessive 1 appetite, 2 grief, 3 joy, 4 drinking, 5 care.

97. A commodious box is 1 strong, 2 watertight, 3 tricky, 4 porous, 5 roomy.

98. A punctilious person is one who is 1 precise, 2 puny, 3 punished, 4 witty, 5 pugilistic.

99. Forbearance is 1 disapproval, 2 vexation, 3 disgust, 4 restraint, 5 transportation.

100. A scorpion is a 1 spider, 2 snake, 3 bee, 4 larva, 5 beetle.
7. John threw a snowball at Warren. Warren ducked, but the snowball hit him on the shoulder and brought a laugh from the rest of the boys. Warren’s face grew red as he made a snowball and threw it with all his might at John. John dodged it, but in so doing slipped and fell into a puddle of water. In a rage John got up, picked up some snow, and, as they ran, put it inside Warren’s collar. Warren turned around and gave John a big shove.

8. Harry, a five-year-old boy, came rushing up to his mother as she was working in the garden one summer day. She wondered what was wrong, for he seemed to be running unusually fast. As he approached her excitedly, he told her that John, his playmate, had fallen into the river about a quarter of a mile away. John had caught hold of a log that carried him to a little island in the middle of the river. Leaving Harry to care for his little sister, Harry’s mother ran to the neighbors and brought Mr. Brown, who was a very good swimmer.

9. Little Bushy Squirrel was busily picking up chestnuts under the big chestnut tree. He was putting his winter supply of food away up in the top of a tall maple tree. As Bushy was running up the maple tree with his chestnuts, he noticed quite a commotion among the small forest folk over at Possum Creek. He at once hurried over to see what was the matter. Mr. and Mrs. Rabbit were crying bitterly. Their small son Jimmy had gone to save Mr. Brown out to Farmer Brown’s barnyard and had not come back. They were afraid he had been caught in a trap or Farmer Brown’s big dog had chased him. At once a small company of forest folk was organized to talk the matter over.

10. John was taking a week’s production of cream to town to sell it. After fastening the large can on the running-board, he started out. The road was smooth and he got along very nicely until he came to a corner about half way to town. There the rope holding the can broke, the can fell off, and the cream spilled out on the ground.

11. The two cars were badly smashed. The car from the north, according to eye-witnesses, was traveling at thirty-five or forty miles per hour just before the collision. The car from the east, while traveling at a moderate speed, almost passed the crossing before its rear wheels and seat were demolished by the bigger car.
1. The sky grew darker and darker. A storm was very near. Lightning flashed. Thunder rolled. Jane was just a little girl and she was very much afraid of storms. She stood at the window looking out. "Oh, mother," she cried, "I am afraid. The rain is coming and the wind is from the west. It will rain in our west windows up-stairs."

2. Mary Ann went down town with her mother one morning to buy some things. Her mother stopped to talk to a friend. All of a sudden Mary Ann began to cry. A big dog was running right toward her. She did not like dogs. This one was very big and black. She had never seen it before.

3. Jack tried to get the big car out of the snow-bank. The wheels were in snow to the hub. He shoveled and shoveled, put on chains, and did everything he could to get the car to move. Nothing would help. Feeling worn out, he sat down on the side of the car and shook the snow from his clothes. He did not know what to do. Soon he looked down the road and saw a man coming with a team of horses.

4. Paul had planned on going to Uncle John's farm for a few days. But now it was raining and Uncle John could never come in all this mud with his new car! Paul was so disappointed that even playing with his dog was not fun any more. All day he sat by the window watching the rain. Toward evening he saw a tiny speck down the road. It came slowly nearer until he could see that it was a man in a wagon. It was Uncle John!

5. Jack had sat all morning on the bank of the lake with his pole and line, but had caught only two small bass. When he first came to the lake a week ago, he had caught three great big perch. Suddenly he felt a big tug on his line. Jack began to pull on the line excitedly. How hard he had to pull! It must be a large fish.

6. Betty tossed the ball to her brother. He tried to catch it, but fell down, and the ball fell through the tangle of vines and flowers at the side of the garden. Suddenly, before the startled children could move, a little man dressed all in green popped out of the bushes and began to rage at them. "Your horrid ball has ruined my home. You must come to our court. We will see if nasty human children may throw their balls into a good elf's house and make him homeless."
PARAGRAPH TEST

Sample Exercise

Note: Read the paragraph carefully. Then read question "A" at the right.

Paul was sitting in the big chair before the fireplace. He had finished his arithmetic and language home work before supper and was now reading the paper. After reading a while, he glanced down the column of "Locals" until he came to this one: "Joseph Grant is spending the week-end at the home of his sister, Mrs. Corson, of this city." Paul and Joseph had been great friends in the lower grades before the Grants moved to a larger city.

A. Which word tells how Paul felt after reading this news? 1 happy, 2 sad, 3 tired, 4 angry. . . . . . A

Note: "Happy" is the word that tells how Paul felt. To show that you think this is the right answer, make a mark like this X in the square that has "1" in it. Now read and answer the next two questions in the same way.

C. What do you think Paul did next? 1 went to a show, 2 telephoned to Joseph, 3 burned the newspaper, 4 sat up all night. . . . . . C

B. What time of day was it? 1 evening, 2 noon, 3 midnight, 4 morning. . . . . . B
DESCRIPTION AND NORMS

1. Purpose and Nature of the Tests. These tests are designed to serve as a measure of the reading ability of pupils in Grades III to IX inclusive, and to serve as a diagnostic instrument for determining pupil difficulties. Three forms of the tests are available. These are identical in difficulty and in construction, each consisting of a vocabulary test and a paragraph test. The Vocabulary Test consists of one hundred words in five-response type, while the Paragraph Test consists of twenty-five paragraphs, each followed by three questions concerning the content of the paragraph, the question being in the four-response form.

The Paragraph Test measures three phases of reading ability, as follows:
1. Ability to understand the general significance of a paragraph
2. Ability to note details
3. Ability to predict the probable outcome

Two distinctive features of the Paragraph Test are: (a) questions measuring each of the three phases of ability are based on the same paragraph, hence each ability is measured by the same instrument; and (b) the three types of questions appear in varying order, so that any particular "mind-set" is avoided, thus presenting a natural reading situation.

Each question intended to measure the ability to understand the general significance of a paragraph is indicated by use of the letter "A"; questions dealing with ability to note details are marked "B"; and those having to do with the probable outcome are marked "C." This makes it possible to get a separate score for each ability and still have the questions arranged in varying sequence for each paragraph.

The teacher thus is provided with an indication of the individual pupil's weaknesses and strengths in reading. The highest possible score on the Vocabulary Test is 100 and on each part of the Paragraph Test 5. Thus the maximum score that can be made is 175.

The time limit for the vocabulary test is 10 minutes; for the paragraph test, 20 minutes. In view of the time required for distribution of papers and for directions, it is advisable to set aside a forty-minute period. The time limits are such that most of the pupils will do about as many exercises as they are able to do. The "power" of the pupil is thus the chief factor measured, although speed of reading is not a wholly negligible factor in the pupil's performance.

Each form of the test consists of two parts, the Test Folder and the Answer Booklet. The pupil records all of his responses on the Answer Booklet, leaving the Test Folder entirely as it was. The Test Folder can thus be used again and again, necessitating only the purchase of additional Answer Booklets. Since the Clapp-Young Self-Marking Device is used, the tests can be scored in a remarkably short time.

2. Validity and Reliability. The curricular validity of these tests is assured by the method of construction and by experimentation. The items in the Vocabulary Test are constructed entirely of words appearing in the Thorndike Word Book and in Horn's Basic Writing Vocabulary. The words in items 1 to 50 inclusive appear in both lists, whereas the remaining words appear in at least one of the lists. In the Paragraph Test all of the words in the first twenty-two paragraphs appear in one of the lists, while in the last three paragraphs there are a few words which do not appear in either list, but which do not cause undue difficulty for good readers. In constructing Form A and B three hundred items were originally tried for the Vocabulary Test and the one hundred comprising each form were chosen from those that were most satisfactory from the standpoint of difficulty and from the standpoint of distinguishing between good and poor readers. The original number of paragraphs was seventy-four, of which number fifty were chosen for the two forms of the test. Similar care was used in constructing Form C, which was issued and administered in two mimeographed editions and in one printed edition in order to insure equivalence to Forms A and B. The materials are for the most part original, though three or four of the more difficult paragraphs in each form are adapted from stories not often read by pupils in the elementary school. The selections of poetry are from Scott's "The Lord of the Isles" and "Harold the Dauntless." By using materials with which pupils would scarcely have an opportunity to become familiar in advance of the test, a more uniform opportunity is provided for all pupils.

Validity of the tests is also indicated by their correlation with other reading tests. The correlation between Form A of this test and Form V of the Stanford Achievement Test, where both were given in grades 5A and 5B to 112 pupils, was r = .83; while the correlation with Form A of the Gates Silent Reading Test was r = .80.

The reliability for each grade group has been determined by correlating the scores earned on Form A with those earned on Form B and later by correlating scores earned on Form A with those earned on Form C. Form A was in each case administered first in grades 3, 5, 7, and 9; the other form was administered first in grades 4, 6, and 8. The reliability coefficients, standard deviations, and the probable error of a score as thus determined are indicated in Table I.

Table I

<table>
<thead>
<tr>
<th>Grade</th>
<th>Coefficient of Reliability</th>
<th>Standard Deviation</th>
<th>Probable Error of Score</th>
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<tbody>
<tr>
<td>Form A</td>
<td>Form B</td>
<td>Form C</td>
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The probable error of a score is determined from the formula, P.E. Score = \( \sqrt{\frac{4}{\text{Coefficient of Reliability}}} \). To illustrate the significance of this measure, let us suppose that a pupil in fifth grade makes a score of 48. Since the probable error of a score at this level is approximately 4 points, the chances are even that the score which this pupil really deserved lies somewhere between 44 (48 minus 4) and 52 (48 plus 4). For a more detailed account of the significance of reliability coefficients and other statistical terms, see any good textbook in educational measurement or educational statistics.

3. Norms. Norms for this test are based upon the testing of approximately 41,000 cases selected from various parts of the United States and from schools varying in size. In Table II the average scores for the various parts of the test are indicated. These represent scores made at the beginning of the school year.

Table II

<table>
<thead>
<tr>
<th>Grade</th>
<th>Vocabulary Test</th>
<th>Paragraph Test</th>
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<tbody>
<tr>
<td></td>
<td>Section A</td>
<td>Section B</td>
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<td>III</td>
<td>12</td>
<td>4</td>
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<td>IV</td>
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<td>30</td>
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<td>VI</td>
<td>38</td>
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<tr>
<td>VII</td>
<td>44</td>
<td>13</td>
</tr>
<tr>
<td>VIII</td>
<td>51</td>
<td>15</td>
</tr>
<tr>
<td>IX</td>
<td>56</td>
<td>17</td>
</tr>
</tbody>
</table>

Those who wish to convert the total scores on the test into reading-age equivalents or school-grade equivalents may do so by referring the scores to Table III. In the column headed "Grade Equivalent" the figure 10.1 refers to the level of achievement shown by the average pupil just entering 10th grade; 9.6 refers to the achievement shown by the average pupil of 9th grade who has been in that grade for six months; etc.
4. Directions for Computing Scores. To find the pupil's score, insert a pencil between the two sheets of the Answer Booklet and break the seal at the bottom, at the top, and at the right edge of the Answer Booklet. The questions which have been correctly marked are those for which the cross is inside the geometric figure on the inner pages. To get the score on the Vocabulary Test, count the number of squares in which crosses appear, omitting those which are encircled. The score on the different parts of the Paragraph Test should be obtained separately. First count all of the squares (A) in which crosses appear and indicate that number. Then count the boxes in the circles (B); and finally count the triangles (C) in which crosses are marked. Enter each of these scores on the front page of the Answer Booklet, in the space provided.

5. Application of the Results. The teacher should note carefully the score made by each pupil on each section of the test. If the score on all parts is much below the norms as indicated on Table II, steps should be taken to effect an improvement. While no attempt is made here to suggest the various methods by which improvement can be secured, it may be said that the chief necessity is that of securing an abiding interest in reading. Frequently this can be accomplished by making available a large amount of relatively easy material dealing with matters within the range of the child's interest.

If a child has a very limited vocabulary as revealed by a very low score on this section of the test, the cause is often, though by no means always, found in low intelligence. Since an understanding of words is essential to good paragraph or sentence reading, a knowledge of vocabulary is very important. Dictionary drills, word games, picture-word matching exercises, etc., often produce good results. Too much attention to the mastery of isolated words is not desired, however, since the pupil should understand that the ability to read sentences and paragraphs is of chief importance.

A very low score on Section A indicates a deficiency in grasping the general significance of materials read. Abundant reading materials such as may be found in newspapers, magazines, and stories of various types should be supplied, together with questions about the general thought of the material read. Paragraphs or articles in which certain irrelevant statements occur may be used to advantage. Ask pupils to read these selections and to indicate which statements are not needed.

A very low score on Section B indicates that the pupil is very inattentive to details and suggests that more attention should be given to having the pupil answer questions about the more minute details of the materials. Such reading materials as the McCall-Griggs Test Lessons in Reading (Published by the Bureau of Publications, Teachers College, Columbia University) have been suggested by Gates as helpful in remedying this type of reading deficiency.

A low score on Section C indicates inability to predict outcomes from the situation given. A very low score on this section often, but not always, accompanies a low score on Section A. Ability to understand the general significance of materials read is essential to an appreciation of probable outcomes. Yet not all pupils who succeed with questions of a type required for success in Section A are able to cope with the questions of Section C. For this type of deficiency the teacher may stop the pupil after he has read part way through an article and ask him to speculate on the probable outcome. Paragraphs similar to those used in the test may be devised by the teacher.

For a more detailed discussion of devices and materials used in the improvement of reading, the reader is referred to the following:

Brueckner, L. J., and Melby, E. O.—Diagnostic and Remedial Teaching
Houghton Mifflin Company, 1931

Gates, Arthur I.—Improvement of Reading: A Program of Diagnosti c and Remedial Methods
The Macmillan Company, 1935

Hildreth, Gertrude—Learning the Three R's
Houghton Mifflin Company, 1935

Nelson, M. J.—Tests and Measurements in Elementary Education
Houghton Mifflin Company, 1935

Pennell, E. E., and Cusack, A. M.—The Teaching of Reading for Better Living
Houghton Mifflin Company, 1935

6. Acknowledgments. The author wishes to acknowledge his indebtedness to a large number of classroom teachers and superintendents who have co-operated in the administration of these tests while they were in the various experimental stages. Special mention is due the following: Mr. H. L. Ronne, Supervising Principal, Valhalla, New York; Miss Violet Fuller, Director of Research, Pueblo, Colorado; Superintendent J. A. Lien, Jewell, Iowa; Principal Hugh Steele, Winterset, Iowa; Superintendent H. O. Dohlen, Opheim, Montana; and a large number of the author's former students now teaching in various sections of the United States.

Acknowledgment is also made of the help received from the writings of Professor Arthur I. Gates of Teachers College, Columbia University, one of the foremost authorities on reading.

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DIRECTIONS FOR ADMINISTERING

Directions for Administering. It is recommended that the examiner work through the entire test before administering it to the pupils, since some of the techniques differ from those used in most tests.

See that each pupil is supplied with two well-sharpened pencils. Have desks cleared of all other materials, then say: "We are to have a new kind of test which I am sure you all will like. The test has two booklets. This is the Answer Booklet and this is the Test Folder. (Exhibit each.) We shall now give you the Answer Booklets. Be sure that you do not open this Answer Booklet at any time."

When the Answer Booklets have been distributed, have the pupils fill in the blanks at the side. Have the pupils fill in only those blanks calling for information that the school desires. When this has been done, say: "We shall now give you the Test Folders. Do not open them until you are told to do so."

When all are supplied, say: "Now put your Test Folder on top of your Answer Booklet so that Sample Exercise Number 1 comes just before the row of squares which has a '1' before it, like this." (Indicate.)

See that each pupil adjusts the booklets properly, then say: "Now read the first Sample Exercise." (These samples and directions appear on the Test Folder and are reproduced here.)

1. John is the name of a: 1 school, 2 girl, 3 river, 4 boy, 5 flower. ................. 1
   "Which word tells the answer?" (Let pupils give the answer.) "What is the number of this word? 'John' is the name of a 'boy,' so 'boy' is the answer. The number of this word is '4.' To show that you think 'boy' is the answer, make a mark like this 'x' in the square that has '4' in it. Read the next two questions and mark your answer in the same way."

2. Bread is something to: 1 wear, 2 play with, 3 write on, 4 eat, 5 work with... 2
   "What is the right answer?" Wait for the correct answer, then say: "Yes. Bread is something to eat, so put a mark in the square which has a '4' in it, because '4' is the number just before the word 'eat.'"

3. A dog is: 1 a rock, 2 a plant, 3 a tool, 4 a person, 5 an animal. ................. 3
   "What is the right answer?" Wait for the correct answer, then say: "Yes. A dog is an animal, so put a mark in the square which has a '5' in it, because '5' is the number just before 'an animal.'"

"If you find that you have made a mistake and marked in the wrong square, do not erase, but simply draw a circle around the wrong answer and mark in the right square." (In order that these directions be observed, it is well to have the pupils put aside erasers.)

"Now turn over the page and fold the page back like this. (Indicate.) Put your Test Folder on top of your Answer Booklet so that the numbers at the right are beside the numbers in the column headed 'For Page 1.'"

See that pupils have booklets adjusted properly, then say: "Do all of these exercises like the samples. When you have finished page 1, turn over the page to page 2 and move your Test Folder over to the column headed 'For Page 2.' Do the same for page 3. Do as many as you can before I say 'Stop.' You may begin."

The examiner will see that no pupil stops at the bottom of the first page. Assistance should be given where necessary in adjusting the second and third pages to the Answer Booklet.

Exactly ten minutes after the signal to begin is given, say: "Stop. Now turn over the Answer Booklet like this. (Indicate.) Do not open the booklet. Close your Test Folder and turn it over so that the last page where it says 'Paragraph Test — Sample Exercise' is on top and right side up. Place the Test Folder on top of the Answer Booklet so that the letter 'A' on the right comes alongside of the 'A' which is just before the first row of squares."

Examiner will see that the pupils have booklets adjusted properly to the squares for the sample exercise; then read the sample paragraph aloud and have pupils answer the questions following the sample exercise as they did in the vocabulary test.

When these have been answered, say: "Now turn over the page. Fold the page back. Place your Test Folder on the Answer Booklet so that the letters at the right will be beside the same letters in the column headed 'For Page 4.' Do them all like the samples. When you have finished with page 4, go on to pages 5, 6, 7, and 8 and do as many as you have time for until I say 'Stop.' Begin."

Exactly twenty minutes after the signal to begin is given, say: "Stop. Put the Answer Booklet inside of the Test Folder and pass both booklets to the front."