Study of summer vacation retention of reading vocabulary and comprehension skills of second graders

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A STUDY OF SUMMER VACATION RETENTION OF
READING VOCABULARY AND COMPREHENSION
SKILLS OF SECOND GRADERS

by
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This research paper has been
approved for the Graduate Committee
of the Cardinal Stritch College by

Sister Marie Glette
Adviser

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGMENTS</td>
<td>iii</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>vi</td>
</tr>
<tr>
<td>Chapter</td>
<td></td>
</tr>
<tr>
<td>I. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>Statement of the Problem</td>
<td></td>
</tr>
<tr>
<td>Scope and Limitations</td>
<td></td>
</tr>
<tr>
<td>Significance</td>
<td></td>
</tr>
<tr>
<td>II. REVIEW OF SELECTED LITERATURE</td>
<td>5</td>
</tr>
<tr>
<td>The Concept of Retention</td>
<td></td>
</tr>
<tr>
<td>Research on Retention of Reading Skills</td>
<td></td>
</tr>
<tr>
<td>Over Summer Vacation</td>
<td></td>
</tr>
<tr>
<td>The Effect of Differences in Ability to Learn Upon Retention of Learning</td>
<td></td>
</tr>
<tr>
<td>Summary of Selected Literature</td>
<td></td>
</tr>
<tr>
<td>III. THE PROCEDURE</td>
<td>26</td>
</tr>
<tr>
<td>Population of the Study</td>
<td></td>
</tr>
<tr>
<td>Description of the Test</td>
<td></td>
</tr>
<tr>
<td>Description of the Testing Program</td>
<td></td>
</tr>
<tr>
<td>Recording and Analysis of Data</td>
<td></td>
</tr>
<tr>
<td>Summary of Procedure</td>
<td></td>
</tr>
<tr>
<td>IV. INTERPRETATION OF RESULTS</td>
<td>34</td>
</tr>
<tr>
<td>Population and Test Used in the Study</td>
<td></td>
</tr>
<tr>
<td>Results of Vocabulary Tests</td>
<td></td>
</tr>
<tr>
<td>Results of Comprehension Tests</td>
<td></td>
</tr>
<tr>
<td>Interpretation of Vocabulary and Comprehension Test Results</td>
<td></td>
</tr>
<tr>
<td>Description of Retentive Abilities</td>
<td></td>
</tr>
<tr>
<td>V. SUMMARY AND CONCLUSIONS</td>
<td>40</td>
</tr>
<tr>
<td>Summary</td>
<td></td>
</tr>
<tr>
<td>Research Results and Conclusions</td>
<td></td>
</tr>
<tr>
<td>Implications and Suggestions for Further Research</td>
<td></td>
</tr>
</tbody>
</table>
BIBLIOGRAPHY .................................................. 47
APPENDIX ..................................................... 51
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Summer Retention of Reading Skills for Second Graders with Practice</td>
<td>13</td>
</tr>
<tr>
<td>2. Vocabulary and Comprehension Test Results</td>
<td>37</td>
</tr>
<tr>
<td>3. Description of Loss, Gain, or Maintenance of Skills</td>
<td>39</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

Summer vacation involves an absence of formalized reading instruction for most primary school children. Some educators feel that the forgetting curve would be quite steep for skills so recently acquired and exercised over only a short period of time. Thus many teachers assume a loss in reading skills over summer vacation, and review rigorously the first few weeks of September. This review might well be inappropriate, however, without an insight into the nature and extent of loss, and the possibility of maintenance or even gain in some skills.

Reading ability might be maintained during the summer because it is particularly related to life out of school, some educational psychologists believe. Many books and magazines are available in the home, and libraries are easily accessible. Television, movies, museum visits, and trips all add to the vocabulary and experiential background.


of children. Furthermore, maturation during the summer may counter any tendency to loss of reading ability.¹
Sorenson felt that even though some educators regard summer vacation as detrimental, any loss is temporary, and children resume their work more matured and refreshed.²

Whether reading skills were lost or gained or maintained during the summer months depends a great deal on the background of the children involved. The general experiential background of the children, their reading ability and achievement, and their exposure to incidental reading during the summer would influence retention of reading skills. Each community or school area differs. Consequently, the experiences of teachers and the results of research in various areas would differ also.

Statement of the Problem

The purpose of this paper was to determine the effect of summer vacation on the retention of reading vocabulary and comprehension skills of second graders. There was specific emphasis upon determining whether skills in vocabulary or comprehension were most affected by absence of formalized reading instruction. A secondary aim was to determine any significant pattern of retention among the high or low achievers on the June tests.

¹Ibid.

Scope and Limitations

The three second grades of a suburban Milwaukee school were tested for this study. The school was located in a middle to upper middle socio-economic area. The children were tested the first week of June using the group Gates-MacGinitie Reading Test, Vocabulary and Comprehension sections, Primary B, Form 1. All classes were tested separately by the writer for uniform test administration. The same children were retested using Form 2 of the Gates-MacGinitie Reading Test the first week of September. Only the children who were present for both testing sessions were included in the population. Formalized reading instruction; i.e. summer school reading courses or tutoring, was noted through a parental questionnaire and those children were dropped from the test population. All test administration and scoring was done by the writer.

The comparison between test scores on the first and second test was on the basis of standard scores. Group scores in vocabulary and comprehension became the basis for finding the significance of amount of retention of these skills. A descriptive analysis of scores was made to determine if there was any pattern in retention among the high and low achievers on the June tests.

The reading instruction of grade two was considered to be of sufficient uniformity not to adversely influence

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test results. The reason for this assumption was the three-basal approach which guided the primary grades in reading skills, and the frequent sharing sessions of the grade two teachers whose classes were involved in the testing program. This study was limited to one June test and one September test. There was no retest given to determine the amount of time needed to regain any losses in reading skills. No attempt was made to stimulate retention nor provide special summer training in reading skills.

Significance

To be worthwhile, what is learned must be retained for further use. The present study was conducted to test summer retention of reading skills with only informal reading practice involved. It was of interest to the writer to discover if the children did indeed retain the reading skills learned in grade two.

The study had its own unique and specific results. These results may be useful to community educators in directing their teaching toward increasing retention of reading skills in the primary grades and in organizing appropriate review in September.
CHAPTER II

REVIEW OF SELECTED LITERATURE

Learning is known by its outcome and cannot be observed without the occurrence of remembering. There are many conditions which affect the amount remembered or retained. The following review of literature will attempt to analyze these general conditions, and then present their specific effect on the retention of reading skills in the early grades according to research findings. The first major heading will be the concept of retention. The second, a review of some research on retention of reading skills over summer vacation. The present study was limited to research in the first four grades. Much of this research was conducted in the 1920's and early 30's. The writer felt, however, that these studies were outdated due to improved research techniques, new approaches to the teaching of reading, increased accessibility of reading materials for summer use, television and other additives to children's experiential background. Consequently, selected research referred to dates only from 1940 to 1970. A specific objective of this paper was the determination of

the amount of retention in children with different reading achievement. Literature pertinent to individual differences in retention was included in the third major heading of this review. The chapter will conclude with a summary of the selected references.

The Concept of Retention
Retention defined

"Retention is the persistence of those modifications of behavior which have been learned." Forgetting is a different aspect of the same process, since forgetting denotes the failure of this persistence. Zero per cent retention implies 100 per cent forgetting and vice versa.\(^1\) Forgetting begins as soon as practice ceases and continues at varying rates.

Relation of learning and retention

Learning and retention of what was learned are a continuous process. Learning can only be judged by the amount retained and used. Thus, the more perfect the memory of the learned activity, the greater the degree of retention.\(^2\) Retention can be measured through recognition, reconstruction, recall, or relearning of the material.\(^3\)

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Since learning takes place over an interval of time, it may be analyzed and described in terms of the components of this time sequence. According to Gagné, there are four phases of the learning sequence.

\[
\begin{align*}
\text{Stimulus} & \quad \text{Situation} \\
\text{Approaching Phase} & \quad \text{Acquisition Phase} \\
\text{Storage Phase} & \quad \text{Retrieval Phase}
\end{align*}
\]

Learning

\[
\begin{align*}
\text{(attending, perceiving, coding)} \\
\text{(acquiring)} \\
\text{(retention, memory, storage)} \\
\text{(recognized, recall, reinstatement, transfer)}
\end{align*}
\]

Of particular concern in the present study was the Retrieval Phase when an individual is called upon to display what he has learned, or put it to use.¹

**Causes of forgetting**

Since optimum conditions for remembering are rarely present, retention is highly subject to reduction by factors.² Various educational psychologists refer to similar factors affecting retention, but they express and emphasize these factors differently.

Gilliland's list of factors was probably the most complete. Although the reference was older than most, the list remained a good summary of the factors involved in retention: time, meaningfulness and the amount of materials, method of learning, motivation and interest, age, overlearning and underlearning, method of reproduction or testing.

¹Gagné, The Conditions of Learning, pp.70-71.
²Ibid., p. 75.
retroactive inhibition, individual differences. The factors most pertinent to the present research were time - the summer vacation interval, retroactive inhibition - the influences on retention during this time, and individual differences - the differences in retention among high and low achievers according to the June tests. McGeoch and Irion stated that the rate of forgetting depended on several conditions surrounding the learning situation: the meaningfulness of material, the degree of original learning, the distribution of practice, the affective tone of the material learned, and the interference of previously learned material or proactive inhibition. However, McGeoch especially, emphasized that the conditions which operated during the retention interval, i.e. between learning and recall, were most directly responsible for the occurrence of forgetting. He described retroactive inhibition as a 'decrement in retention resulting from activity, usually a learning activity, interpolated between an original learning and a later measure of retention.'

McGeoch's experimentation with retroactive inhibition indicated that maximal identity of the original and the interpolated material yielded the maximal recall. He also found that susceptibility to interference from interpolated activity diminished as the degree of original learning


increased. Retroactive inhibition was found to be quite transitory if retention was measured after some relearning took place. Its effects tended to dissipate during the first few relearning trials.\textsuperscript{1}

Flessey described the effects of quantitative or time changes, and qualitative changes. The latter he explained as a tendency of new learnings to be modified as they became related to old learnings. In addition to this, emotional and ego-involved factors contributed to the distortion, modification, or improvement of learnings. "Thus, retention will be conditioned, retarded, or advanced by what a child does before, during, and after the actual period of formal learning."\textsuperscript{2}

Gagné included three causal factors: the number of learning events occurring in the time interval, the distractions following learning, and the passage of time.\textsuperscript{3}

Craig believed that "...by far the most important factor in retention is the adequacy of original learning."\textsuperscript{4}

\textbf{Research on Retention of Reading Skills Over Summer Vacation}

Retention of reading skills

Potentially all the conditions which can affect

\textsuperscript{1}Ibid., pp. 426-27.
\textsuperscript{2}Flessey, Horrocks, and Robinson, \textit{Psychology in Education}, p. 287.
\textsuperscript{3}Gagné, \textit{The Conditions of Learning}, p. 75.
retention were present in the case of retention of reading skills over summer vacation. The educational psychologists just cited found that some of these conditions were present in the child before learning, some affected the child while he was learning, and some conditions were effective in the interval between learning and testing. Both the research summaries of educational psychologists and the reports of classroom research will be reviewed.

Neither Sorensen nor Pressey found summer vacation detrimental to the retention of reading skills in their synthesis of research. Sorensen felt that formal, factually orientated abilities, such as history, geography, and arithmetic computation, may decline over the summer and require two to fifteen weeks to be regained. Reading ability and reasoning power, however, were maintained due to summer reading practice and general activity. Sorensen strongly believed that summer vacation supplied a time for maturation and new experiences.¹ His textual comments included only two references to research and the entire data were not supplied. Applicability may therefore be limited.

Pressey referred to the reading studies of Bruens, Bruechner, Irmina, Patterson, and Elder, who conducted research on various school levels. He said these and other studies show "... either no loss or only a slight one during summer vacation; where there are losses, they disappear

¹Sorensen, Psychology in Education, 284-285.
rapidly with the opening of school.¹ Researchers have found that there appeared to be a differential retention in various subjects over summer vacation. For example, Sister M. Irma, studying grades four to eight over a twelve week vacation, reported a small loss in history, a gain in reading, a fair loss in arithmetic, and much loss in zoology. This might have been due to " incidental learning which interferes with the rate of forgetting in some subjects more than others, ...and the effect of use of practice in some subjects but not in others."²

Research on retention of reading skills for lower grades

Review of the reports on classroom research indicated that few investigations of summer vacation reading retention were recent, and few were done with primary children. These two discoveries were substantiated in an unpublished thesis by Resnieck. Her investigations of research led her to believe that few early investigations of upper and intermediate grades reported significant loss, while there were generally losses among primary children. The extent of these differences largely corresponded to the age and number of the subjects employed in the studies, she thought.³ The

¹Pressey, Harrocks, and Robinson, Psychology in Education, p. 268.
²Ibid.
writer felt that other retention variables might also have
effected the difference in conclusions.

Included in this review were three classroom studies
which were thought to contain sound research relevant to
the topic.

The earliest study included was that of Cook. Cook
found that primary children at the Laboratory School at
Mankato State Teachers College lost three to four months'
reading ability over summer vacation. The children were
tested over a period of four years. Cook noted that this
was a small group of predominantly slow-learning children.
They probably lost reading skills due to lack of practice.
She theorized that children with an IQ below 90 usually
did little summer reading; those with an average IQ but
some reading difficulties read little also; and those with
a high IQ and those who enjoyed reading read quite a bit
when material was available.

The research project she devised was intended to
increase summer retention among 25 first graders and 27
second graders through practice. In both May and September,
the Gates Primary Reading Test was given to Grade One, and
the Gates Test and the Primary Reading Test of the Metro-
politan Achievement Test were given to Grade Two. Work
envelopes were provided for all the children for practice
15 to 20 minutes a day, five days a week. The work enve-
lopes included reading, plus manuscript writing, and
arithmetic. The reading contents for grade two envelopes,
which would be of particular interest in this report, included: books of the children's reading levels with directions for assignments, a list of Stone and Dolch words which had been especially difficult for the children, answers for all the work, and progress charts. The instructions and amount of work were provided according to ability as found in the Spring test. No new material was included.

In September, the classes were divided according to the number of weeks they followed the work envelope instructions. Generally, those who had made lower scores on the first test or lacked interest discontinued practice earlier.

Only the Gates and Metropolitan test results for Grade Two were reported here, since these results were most pertinent to the paper.

**TABLE 1**

**SUMMER RETENTION OF READING SKILLS FOR SECOND GRADERS WITH PRACTICE**

<table>
<thead>
<tr>
<th>Tests</th>
<th>0-3 wk. practice</th>
<th>4-7 wk. practice</th>
<th>8-11 wk. practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gates results</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>word recognition</td>
<td>-.18</td>
<td>-.13</td>
<td>.08</td>
</tr>
<tr>
<td>Sentence reading</td>
<td>-.36</td>
<td>-.07</td>
<td>-.01</td>
</tr>
<tr>
<td>Paragraph reading</td>
<td>-.39</td>
<td>.17</td>
<td>.15</td>
</tr>
<tr>
<td>Metropolitan result</td>
<td>-0.26</td>
<td>-0.22</td>
<td>-0.09</td>
</tr>
</tbody>
</table>

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1Cook, "Vacation Retention of Fundamentals By Primary Grade Pupils," 218.
Table 1 indicates that, on the whole, the less the amount of practice, the greater the loss of ability. The pupils who practiced all summer retained their reading skills or made some gain. Individual gains in all areas in the eight to eleven week practice group were generally higher, and losses were generally less. Similar results were reported for the first grade group.\(^1\)

Another more recent study was conducted to show the positive effect of practice on retention of reading skills. Aasen reported a study among 96 Fourth Grade children in the Minneapolis Public Schools. The purpose of the study was to encourage reading during summer, so skills would not suffer from disuse. Aasen wrote, "The story of rusting skills is told in reading-achievement scores that show a big drop each year in fall."\(^2\) She believed that vigorous growth was possible with a well-planned and well-guided free reading program.

The experimental group included 31 children in Classroom A and 33 in Classroom B. Their reading stimulants included: lists of topical book preferences, extra training in use of the library, summer use of the traveling bookmobile, parental encouragement, motivational discussions of the reading plan, and records for progress. The Control

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\(^1\) Ibid, 218-219

Group included 32 children. They received no reading stimulants. All three classrooms had similar average Iq's and similar middle class backgrounds.

All the children were tested on the Stanford Reading Achievement Test in June and again in September. The Average Grade Equivalent for the Experimental Group was 5.4 in June and 6.1 in September, showing a seven month gain over the summer. The Control Group showed a 5.2 Average Grade Equivalent in June and the same in September, showing no gain or loss. Results also indicated that a higher percentage of those in the Experimental Group showed gains, and these gains were greater than those of the Control Group. Of the Experimental Group, 68 per cent showed average gains of one year seven months, while 28.1 per cent showed losses. Of the Control Group, 37.5 per cent showed average gains of seven months, while 56 per cent showed losses.¹

While Aasen's study did indicate the positive effects of practice upon reading retention, two points need to be noted. McGeogh regarded the term disguise of learning as an unacceptable reason for forgetting.² Secondly, there was no loss reported for the Control Group as a whole, indicating that, as a group, their skills were maintained without reading stimulants.

The third classroom study included in this paper was Resnick's study on the effect of summer vacation on children

¹Ibid., 70-74.
entering grade two. She also compared degree of retention to ability groups. The population included 23% children who had completed grade one in five different parochial schools in a Chicago suburb. Eight classes were used. The children ranged from low middle to upper middle class background. The mean IQ as determined by the Otis Quick Scoring Mental Ability Test exceeded the national average.

The children were tested before and after summer vacation using the Developmental Reading Test, Form L-A by Bond, Clymer and Hoyt. Reznicek found that the "group as a whole suffered significant losses in all areas of reading achievement measured by the test." The Basic Vocabulary loss was less serious than the loss for General and Specific Comprehension. The mean grade equivalent for May in General Comprehension was 3.08, while in September it was 2.79. The difference of .29 indicated a three month loss over summer vacation, which is significant at the .001 level of confidence. Specific Comprehension showed a loss of two months, and Basic Vocabulary showed a loss of one-half month.

In the comparison of ability groups, the scores for the upper 27 per cent of the children indicated insignificant gains in Basic Vocabulary, significant losses in General Comprehension, and insignificant losses in Specific Comprehension. Significant losses were found for the middle ability group in all areas except Basic Vocabulary. Signifi-

cant losses were found for the low ability group in all
areas.¹

A parallel in the results of the research of Resnicok
and Cook may be noticed. In both these studies, word recog-
nition or basic vocabulary showed the least general loss.
Comprehension in the two studies was measured differently,
so the results could not be compared.

Summary of research on reten-
tion of reading skills for
lower grades

From an assessment of the results of research in the
classroom, no definite conclusion about retention of reading
over summer vacation can be made. More significant losses
than gains were evident. It is probable that individual
losses and gains tended to equalize each other when data for
the whole group were analyzed.

Two points were considered noteworthy:

1. Practice in reading increased retention of
skills

2. Children with greater ability generally
retained more skill in reading

The Effect of Differences in Ability to
Learn Upon Retention of Learning

Individual differences in learning ability was con-
sidered one of the factors affecting retention. No studies
were found on the comparison of reading achievement to re-
tention of reading skills in the primary grades. In the

¹Ibid., pp. 41-52).
absence of such specific studies, research on the degree of retention between fast and slow learners of any age level was considered relevant.

There were two approaches to the relationship between learning abilities and retentive abilities; the traditional approach and the more recent approach. The recent research in this area was found to be concentrated mainly on laboratory studies of college students, although one very recent use of fifth grade subjects was located. The writer felt, however, that the concepts contained in this research were pertinent to the primary grades as well as to college.

**Traditional approach**

McGeoch and Irion propagated the more traditional generalization that fast learners retain more than slow learners. "By and large, individual differences in learning are reflected in individual differences in retention," since, "learning and retention are the same continuous process." The conditions and variables which determined the original learning, in part, determine retention, they felt.1 In measuring individual retention according to this approach, complications arose in distinguishing degree of original learning, since fast and slow learners were allowed equal time and practice. Thus, if measured by recall, the slow learner would have learned less and would have less to retain. If measured by the relearning method, the slow

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learner could learn more because he had missed parts of the original learning. Retentive ability was often compared to IQ scores, which were considered the measure of ability.

Using this approach and the recall method of measurement, Resnicok found that first grade children of low ability retained less reading skill than those of high ability. Kolberg correlated IQ and retention in a study of seventh and eighth graders. He found a small positive correlation between intelligence quotient and score change over summer vacation, using the Van Wagenen American History Scales, which give the difficulty of tasks which pupils can do with 50 per cent correctness. He further concluded that retention on easy material was similar for all subjects, but superiority in retention of difficult material was found for those with IQ's above 120.

More recent approach

The more recent approach to the relationship between learning abilities and retentive abilities was that expressed by Russel and Keppel: "Although there are rather large differences in the learning ability of individuals ... it does not necessarily follow that similar differences

1 James B. Stroud and Lowell Schau, "Individual Differences in Memory," Journal of Educational Psychology, L (December, 1959), 265.


are present in memory. Shuell and Keppel felt that the recent studies indicated that fast and slow learners forget at the same rate.\textsuperscript{1} In this approach, subjects attained common performance criterion and the difference in the rate at which this was done was used to define differences in learning ability. After material was equally mastered by all, studies could be conducted to determine individual differences in retention.\textsuperscript{2}

Stroud and Carter conducted laboratory research on individual differences in retention at the University of Iowa using psychology students as subjects. To achieve the common performance criteria, slow learners required more trials and item presentations than fast learners. The fast and slow learning groups were defined by the differences in the rate at which they learned two word lists of different lengths. Stroud and Carter "...accepted the assumption that retroactive inhibition is our principle explanation of loss in ability to recall learned material."

Results indicated that ability differences in recall were not generally significant. However, the long list was designed to test retroactive inhibition. The experiment suggested that slow learners may be more susceptible to

\textsuperscript{1}Thomas J. Shuell and Geoffrey Keppel, "Learning Ability and Retention," \textit{Journal of Educational Psychology}, LXI (February, 1970), 59.

\textsuperscript{2}Stroud and Schau, "Individual Differences in Memory," 285.
various kinds of interfering effects.\(^1\)

The preceding study of individual differences in retention had all the inherent flaws of laboratory testing, use of nonsense words, and lack of random sampling. However, the degree of original learning and the effect of retroactive inhibition were controlled in the experiment. Results may, therefore, be useful in a limited way in furthering understanding of the effects of these variables upon ability groups.

Schuell and Keppel controlled the variable of degree of original learning in their study of 72 Fifth Graders of average learning ability from one school. Now word lists were presented by an automatic slide projector for the pretest. Subjects were ranked on the basis of the number of words correctly recalled after five minutes. The upper 36 students were considered the fast learners and the lower 36 students were considered the slow learners. The students were then equated in degree of original learning, so that the results would not merely reflect differences in original learning.

After a 24 hour retention interval, both fast and slow learners had forgotten 45-50 per cent of the original learning. There was little difference in amount retained after a 48-hour interval. Results indicated that \(\ldots\) the rate of forgetting between fast and slow learners is very

\(^1\)James B. Stroud and L.J. Carter, "Inhibition Phenomena in Fast and Slow Learners." *Journal of Educational Psychology*, LII (February, 1961), 30-34.
small when degree of original learning is taken into
account.1

At the time of this writing, the more recent approach
to experimentation with individual differences in learning
ability had not yet progressed from the laboratory situation
to the classroom. Thus, the newer theories about two reten-
tion variables have not yet been demonstrated in a classroom
situation. Laboratory experimentation yielded the following
results:

1. Control of the variable of amount of original
learning tended to equalize retention of all
learning groups.

2. Control of the variable of retroactive
inhibition, or interference from inter-
polated activity, tended to affect slow learners
more than fast learners.

Summary of Selected Literature

This chapter has progressed under the following
headings:

The Concept of Retention
Research on Retention of Reading Skills
Over Summer Vacation
The Effect of Differences in Ability to
Learn Upon Retention of Learning

Educational psychologists referred to similar factors
affecting retention. Generally, the factors summarized by
Gilliland were considered most responsible for the degree
of retention: time, meaningfulness and amount of materials,
method of learning, motivation and interest, age, over-

1Shuell and Keppel, "Learning Ability and Retention,"
63-64.
learning and underlearning, method of testing, retroactive inhibition, and individual differences. To this list, Gagné and Pressey added proactive inhibition.

Of these variables affecting retention, time, retroactive inhibition, and individual differences in learning ability were most relevant to the research conducted for this paper. Summer vacation was the time interval during which there was no formal reading instruction. Retroactive inhibition referred to the possible interference from interpolated activity during the time interval between the learning of reading skills and the final test of recall.

McGeoch regarded retroactive inhibition as the primary factor affecting retention, as did Stroud and Carter. McGeoch's experimentation with retroactive inhibition indicated the following points: greater recall resulted from increased learning of original material and from increased identity of original and interpolated material, and the effects of retroactive inhibition were quite transitory if measured after some relearning took place. When retroactive inhibition was controlled in the laboratory research of Stroud and Carter, it was found that slow learners were more susceptible to interferences than fast learners.

Besides time and retroactive inhibition, individual differences in learning ability was considered a pertinent factor in the present research. Research on summer retention of reading skills indicated that slow learners tended to forget more than fast learners when both were given
equal practice. This research expressed the traditional approach: individual differences in learning were reflected in individual differences in retention. However, recent literature questioned this generalization, and offered some laboratory evidence that individual differences in retention appeared to be minimal when the degree of original learning was taken into account. Experimentation of Stroud and Carter and Shuell and Keppel indicated that after a common performance level was reached by fast and slow learners, ability differences in recall were not significant. It must be noted, however, that this recent experimental approach had only been conducted in a laboratory situation.

Research on summer retention of reading skills was dependent on the effects of various factors affecting retention and there was little agreement in results. Educational psychologists who summarized many research projects tended to find that summer vacation was not detrimental to reading skills. They indicated that reading ability was generally maintained due to general activity and practice, and any losses could quickly be regained. The classroom studies generally indicated that summer vacation was detrimental to reading skills. In research with children of average learning ability in fourth grade or below, both Cook and Semnack reported a general loss of reading skills when no planned practice was involved. Cook and Aasen found that practice of reading skills in summer increased
retention. Cook discovered that the less the amount of practice, the greater the loss of reading skills.

Chapter III will describe the research procedure for the present paper.
CHAPTER III

THE PROCEDURE

The purpose of this experimental study was to determine the retention of reading vocabulary and comprehension skills among second graders over summer vacation.

Population of the Study

The three second grade classes of a suburban Milwaukee school were chosen for the study. The school was located in a middle to upper-middle socio-economic area. The majority of the children had had the benefit of a wide experience background coupled with the opportunities offered by an interested community.

The three classes involved were taught according to a tri-basal approach to reading. The teachers of the classes frequently shared progress and procedures.

Description of the Test

The test used in the study was part of the 1965 series of the Gates-MacGinitie Reading Tests which cover Kindergarten through Grade 12. The series replaced the Gates Primary and Advanced Primary Reading Tests and the Gates Reading Survey. Primary B, Forms 1 and 2, were particularly designed and constructed for use with
Grade Two.¹

Norms were based on recent nationwide standardization. Alternate forms were constructed to provide "item-by-item balance in difficulty and roughly similar distribution of content."² Reading test scores were adjusted to the scores of the *Lorge-Thorndike Intelligence Tests*, 1964 edition.

In formulating norms, Gates and MacGinitie took into account the uneven growth rate of reading skills during the year.

In the primary grades, scores may be higher at the end of one grade than at the beginning of the next. That is, there is typically slower gain, or even loss, in reading skill during the summer. It was thought best to try to preserve in the norms the rapid rise in reading skill that actually occurs during the school year rather than to smooth out all irregularities in the growth curve.

Reliability, i.e., the accuracy of scores obtained on a test, was computed through a reliability coefficient and an alternate form reliability coefficient, which took into account variations in pupil performance. For Primary B, the alternate form, reliability was .87 for vocabulary


³Ibid.
and .81 for comprehension. By the split-half method, reliability was .93 for both vocabulary and comprehension.¹

Test directions were easy to understand for both administrator and subjects. Each test form consisted of two parts. The 15 minute Vocabulary Test sampled ability to recognize or analyze isolated words. In each of 48 exercises, the children were directed to circle one of four words that best corresponded to the picture. The 25 minute Comprehension Test sampled ability to read and understand the total thought of a paragraph. In each of 36 passages, the children were directed to mark the picture that best illustrated the meaning of the passage or that answered the question in the passage.²

Description of the Testing Program

The Gates-MacGinitie Reading Test, Primary B, Form 1, was administered to the three second grades by the writer from June 1 to June 4, 1970. All testing was done at the beginning of the school day. The schedule for administration was as follows: The Vocabulary Test was given separately to two classes June 1, and the Comprehension Test given separately to these same classes June 3. The writer's class took the Vocabulary Test June 2 and the Comprehension Test June 4. Although reading instruction

¹Ibid.

continued through this week, there was no formal reading
instruction in any of the classes after the first week of
June.

The alternate form 2 of the Gates-MacGinitie Reading
Test was administered in the morning of September 3 to the
same children. The children had been randomly assigned to
three third grade rooms, and each room was tested separ-
ately. It was impossible to administer the tests in the
same order and pattern as was followed in June because the
writer had been transferred to another school. In the
September testing, the Vocabulary Test and the Comprehension
Test were administered in succession with a short break in
between. The test was given two days after the opening of
school in order to eliminate the possibility of any relearn-
ing of reading skills, which would influence test results.
The time interval between the two tests was thirteen weeks,
or approximately three months.

The second grade classes chosen for the study had en-
rrollments of 21 or 22 children each, a total of 65 children.
Of these, 55 children were present for total June testing.
Of these children, 49 were present for the September test.

Since the purpose of this study was to determine the
retention of reading skills in the absence of formalized
teaching, a parental questionnaire was needed to further
identify the population. The questionnaire¹ was sent to
the parents of the 49 children who had been present for

¹Appendix, p. 51.
both the June and September tests. The parents were asked to identify and explain any summer school course or tutoring which could be considered formal reading instruction. Forty-two parents replied. One child had been involved in a summer school program that required reading. Another child had been tutored in reading during the summer. Questioning of the seven children whose parents did not reply did not disclose any further summer reading instruction. It was assumed, therefore, that these two children were the only ones to be dropped from the population due to formal reading instruction during the summer vacation. The final population for the study was 47 children.

Recording and Analysis of Data

All scoring was done by the writer. The raw score for the Vocabulary and Comprehension Tests was the number of correct answers on each. Tables transformed the raw scores into equivalent percentile norms, grade scores, and standard scores. Only standard scores were used to find the significance of difference between June and September scores. Grade scores and percentile scores were unacceptable because they were not equal-interval scores and so could not be added or subtracted. The standard score scale was acceptable because it was an equal-interval scale, and scores could, therefore, be added, subtracted, averaged, and compared. Standard scores were expressed in terms of number of standard deviations from the mean of normal distribution. Standard deviation was set at 10 and the
The standard score norms were given for three points during the school year: October, February, and May. The May norms, or 2.8 grade level, were used for converting both June and September raw scores to standard scores, since the May grade placement was closest to both testing times. Vocabulary and comprehension standard scores were treated separately, rather than give a misleading impression of a child's ability by averaging the two scores.

For the June tests, standard scores for the vocabulary and comprehension tests were the basis for computing the mean, standard deviation, and standard error of the mean. The same order and pattern of statistical procedures was employed for the September vocabulary and comprehension tests. Comparisons between the vocabulary scores in June and September and the comprehension scores in June and September were made by computing the standard error of the difference of the mean. The t-test was employed to determine the reliability of the significance of differences in retention.

A comparison of each individual's standard score for vocabulary and comprehension was made to determine if there was any significant pattern in retentive abilities. Each child's standard scores for June in vocabulary and comprehension was compared to his September score. Losses, gains, and maintenance of skills were noted.
Summary of Procedure

The following procedures were employed in determining the retention of vocabulary and comprehension skills among second graders over summer vacation:

1. The three second grade classes of one suburban school were chosen for the study.

2. The vocabulary and comprehension sections of the *Gates-MacGinitie Reading Test*, Primary B, Form 1, were administered to 55 children from June 1 to June 4, 1970.

3. The tests were scored and the standard scores for the vocabulary and comprehension tests were recorded separately.

4. The vocabulary and comprehension sections of the *Gates-MacGinitie Reading Test*, Form 2, were administered to 49 of the same children on September 3 after an interval of three months.

5. The tests were scored and the standard scores for the vocabulary and comprehension tests were recorded separately.

6. A parental questionnaire identified two children who had received formal reading instruction during the summer vacation. After these children were dropped, the final population was 47 children.

7. The vocabulary and comprehension scores for the June and September tests were statistically compared to find the significance of difference in retention.
8. A comparison of each individual's standard score for vocabulary and comprehension was made to determine if there was any significant pattern in retentive abilities.
CHAPTER IV

INTERPRETATION OF RESULTS

Population and Test Used in the Study

In order to determine the retention of vocabulary and comprehension skills among second graders over summer vacation, alternate forms of the Gates-MacGinitie Reading Test, Primary B, were administered in June and September. There was a time interval of three months between tests. The original population of the study included 65 children from three second grade classes. Of these children, 55 were present for the June testing. Due to absences and moving, 49 of these children received the September test. Two children were found to have received formal reading instruction during the summer and were dropped from the population. The final population was 47 children.

Results of Vocabulary Tests

The June and September raw scores for vocabulary for the 47 children in the population were converted to standard scores. The highest standard score possible was 71 and the lowest possible score was 30. The scores of the group tested ranged from 68 to 40 in June, and from 69 to 36 in September. The mean for the June vocabulary test was 56.12.
The group as a whole was more than one-half standard deviation above the normalized standard mean of 50. The standard deviation, which would indicate the deviation of scores from the mean, was 7.71. The mean for September was 54.76, with a standard deviation of 7.47. Both the standard deviation for June and September were smaller than the normalized standard deviation of 10, indicating that the group tested was more homogeneous in reading skills than the average group.

The difference between the vocabulary means for June and September was 1.36. This value indicated that there was a slight loss in retention of vocabulary skills over the summer vacation.

Results of Comprehension Tests

The June and September raw scores for the 47 children in the population were converted to standard scores. The highest possible standard score was 70 and the lowest possible score was 30. The scores of the group tested ranged from 70 to 39 in June, and from 70 to 30 in September. The mean for the June comprehension test was 54.59, and the standard deviation was 8.80. The group mean of 54.59 was one-half standard deviation above the normalized standard mean of 50. The mean for the September comprehension test was 50.78, and the standard deviation was 8.56. The September comprehension mean of 50.78 was very similar to the normalized standard mean of 50. Thus, after summer vacation the reading skills of the group tested could be
considered average; i.e. at the center of a normal distribution.

The standard deviation for both the June and September comprehension tests was larger than for the vocabulary tests. This would indicate a greater deviation of scores from the mean; i.e. a greater range of scores. One September comprehension score was considered by the authors of the test to be too extreme a raw score to be assigned a truly reliable norm. The nearest raw score of 8 was used in conversion of this extreme score to standard score.

The difference between the June and September means for comprehension was 3.81, a larger difference than the difference between the means for vocabulary. This would indicate that the loss of comprehension skills over the summer vacation was greater than the loss of vocabulary skills.

**Interpretation of Vocabulary and Comprehension Test Results**

In this study, the t-test was used to determine the significance of the difference between means. This test was employed to determine whether the loss of vocabulary skills between June and September would be considered significant or if this difference could be due to chance.

Table 2 lists the results for both the June and September vocabulary and comprehension tests, and the statistical comparison of these results.
### TABLE 2

**VOCABULARY AND COMPREHENSION TEST RESULTS**

<table>
<thead>
<tr>
<th>Test</th>
<th>Date</th>
<th>Mean</th>
<th>S.D.</th>
<th>S.E.M.</th>
<th>M.D.</th>
<th>S.E.M.</th>
<th>t</th>
<th>Conf. Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vocab.</td>
<td>June</td>
<td>56.12</td>
<td>7.71</td>
<td>1.13</td>
<td>1.36</td>
<td>.78</td>
<td>1.76</td>
<td>Insg. Diff.</td>
</tr>
<tr>
<td></td>
<td>Sept.</td>
<td>54.76</td>
<td>7.47</td>
<td>1.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comp.</td>
<td>June</td>
<td>54.59</td>
<td>8.80</td>
<td>1.29</td>
<td>3.81</td>
<td>1.05</td>
<td>3.62</td>
<td>1% Level of Conf.</td>
</tr>
<tr>
<td></td>
<td>Sept.</td>
<td>50.78</td>
<td>8.56</td>
<td>1.26</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Standard Error of the Difference between Means.

The t-ratio for the vocabulary results was 1.76. This value did not indicate a significant difference between means since 1.76 was below 1.96, or the 5% level of confidence. There would be a reasonable probability that the loss of vocabulary skills over summer vacation might be due to chance, and that another group of second graders could have gained or maintained their vocabulary skills under the same conditions. A difference of near 1.76 would be expected to occur in about 10% of the cases.¹

A t-ratio of 3.62 was found for the comprehension tests. This difference was considered significant at the 1% level of confidence. In other words, a difference between the means as large as 3.62 could occur by chance.

less than once out of 100 times. Therefore, factors other than chance were probably involved in the loss of comprehension skills over the summer.\(^1\) Whatever conditions affected the loss of retention of comprehension skills could quite possibly produce the same results in another population. In a normal distribution curve, 99.96% of the cases used would be included at 3.62 sigma units from the mean.\(^2\)

Results indicated that there was a loss in both vocabulary and comprehension skills for the group as a whole over summer vacation. The loss in vocabulary was not considered a significant loss, but the loss in comprehension skills was considered significant at the 1% level of confidence.

**Description of Retentive Abilities**

An original intention of this study was to analyze individual differences in retentive abilities. The population was to be divided into three subgroups according to the June achievement, and these groups compared to their corresponding scores in September. This analysis was not possible, however, since dividing the group into thirds would have placed children with identical standard scores in two subgroups.

Although a statistical analysis of retentive abilities was not possible, a descriptive analysis was conducted. Table 3 shows the analysis results.

\(^1\)Ibid. pp. 102-105

TABLE 3
DESCRIPTION OF LOSS, GAIN, OR MAINTENANCE OF SKILLS

<table>
<thead>
<tr>
<th>Test</th>
<th>No. of Pupils with Lower Sept. Scores</th>
<th>No. of Pupils with Higher Sept. Scores</th>
<th>No. of Pupils with Same Sept. Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vocabulary</td>
<td>25</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td>Comprehension</td>
<td>29</td>
<td>14</td>
<td>4</td>
</tr>
</tbody>
</table>

The September vocabulary and comprehension of each child was compared to his June scores. No definite pattern or trend in retentive abilities was noted. Gains, losses, and maintenance of skills were seemingly well distributed among the whole population. There was no evidence of more gains or maintenance of skills by higher achievers on the June tests, nor loss of skills among the lower achievers on the June tests. There was a tendency toward a regression effect among the top achievers in both vocabulary and comprehension, however. That is, there was a tendency for pupils with the highest June scores to regress toward the mean in the September test results.

Generally, the majority of the children were affected by a loss of retention of vocabulary and comprehension skills over summer vacation. There was a slightly larger number of children who experienced a loss in comprehension skills than in vocabulary skills.
CHAPTER V
SUMMARY AND CONCLUSIONS

Summary
This study was planned in order to determine the effect of summer vacation on the retention of reading vocabulary and comprehension skills among second graders. There was specific emphasis upon determining whether skills in vocabulary or comprehension were most affected by absence of formalized reading instruction. A secondary aim of the research was to determine any significant pattern of retention among the high or low achievers on the June tests.

A survey of related literature revealed that there was little agreement on summer vacation retention between writers of educational texts and those teachers who had conducted classroom research. Educational psychologists who summarized many research projects tended to find that summer vacation was not detrimental to reading skills. They indicated that reading ability was generally maintained due to general activity and practice and that any losses could be quickly recovered. On the other hand, classroom studies involving fourth grade and below generally reported more significant losses than gains, and the teachers felt that the vacation was detrimental to reading skills. The class-
room studies were in agreement on two additional points:

1) Practice in reading during the summer increased summer vacation retention.

2) Children with greater ability generally retained more skill in reading.

Retention of material was considered by all sources to be an integral part of the learning process. Learning can only be judged by the amount retained and used. However, retention is highly subject to reduction by a number of factors: time, meaningfulness and amount of materials, method of learning, motivation and interest, age, over-learning and under-learning, method of reproduction or testing, retroactive inhibition, proactive inhibition, individual differences. Of these factors, those regarded most pertinent to the present research were time, retroactive inhibition, and individual differences in retentive abilities. Several authors felt that retroactive inhibition; i.e. in this case, summer activities, were most directly responsible for the loss in ability to recall learned material. Generally, individual differences in learning were felt to be reflected in individual differences in retention. More recent authors felt that fast and slow learners forget at the same rate when amount of original learning was equalized. However, their research results suggested that slow learners were more susceptible to retroactive inhibition than fast learners.

The present study involved three second grade classes from one suburban Milwaukee school. The 47 children
included in the population were tested using the Gates-MacGinitie Reading Test, Primary B, in June. After a summer vacation interval of three months, these same children were tested using an alternate test form. A parental questionnaire eliminated two children from the original population who had received formal reading instruction during the summer.

Standard scores were used for statistical analysis. Data obtained from the June administration of the vocabulary and comprehension tests were compared to data obtained from September testing in order to measure the possible gain, loss, or maintenance of reading skills. All tests were administered and scored by the writer.

Research Results and Conclusions

Results

Test results indicated that there was a loss in both vocabulary and comprehension skills for the group as a whole. The difference between the vocabulary means for June and September was 1.36. This value was not considered an indication of significant loss of retention in vocabulary skills. The difference between the comprehension means for June and September was 3.61. A t-ratio of 3.62 was obtained which was significant at the 1% level of confidence. Given the same conditions, this loss could occur 99 times out of 100.

Although no statistical analysis of individual differences in retentive abilities was conducted in the
present research, a descriptive analysis was made. When September scores were compared to June scores, there seemed to be no pattern of losses, gains, or maintenance of skills among high or low June achievers. Gains, losses, and maintenance of skills were seemingly well distributed across the entire population.

Conclusions

Analysis of the data gathered in this study lead to several conclusions. The majority of the children involved in the study suffered a loss in vocabulary and comprehension skills. The loss in vocabulary skills was not considered a significant loss. The loss in comprehension skills was considered a significant loss which could not be due to chance. This finding suggested that comprehension skills were more subject to a retention loss after an interval of time than were vocabulary skills.

This loss could have been due to one or more conditions known to affect retention. For example, time away from formal reading instruction may have more effect on comprehension skills than on vocabulary skills. Perhaps the lack of strength of original learning could have affected the comprehension skills, since these skills were emphasized later in the school year than were vocabulary skills. The type of test may have been different from the type of work the children had been accustomed to. Little testing of comprehension skills had been conducted at the school previous to this test, although phonics tests had
been given. Possible comprehension skills were more subject to interference from summer activities, since the everyday activities of looking at television or magazines may have provided some maintenance of vocabulary skills.

Generally, it appeared that incidental exposure to reading through magazines, television, and travel was insufficient to afford maintenance or gain of reading skills during the summer. Neither did natural maturation provide the children with increased insights or abilities to perform the reading required of them in the test.

There was no predominance of gains, losses, or maintenance of skills among any reading achievement group in this study. Perhaps the lack of a pattern in retentive abilities, i.e. low achievers displaying more skill losses or high achievers displaying more skill gains, was due to the basis of comparison used. The amount of retention was compared to the amount actually learned, as demonstrated through achievement on the June test.

Limitations

Several limitations narrowed the applicability of the present study. The study lacked a retest to determine the time necessary for regaining reading skills. Furthermore, since other subject matter areas were not tested, it was not possible to determine whether reading skills would be regained more quickly than the skills in other subject areas. There was no method for determining the type or amount of
incidental reading practice engaged in by individual children. There was no special summer program in reading skills for a control group, which could have provided a means of comparing retention with and without practice. Due to the type of scoring involved in the test, it was also impossible to carry out an original intention of the research: a statistical analysis of individual difference in retentive ability using the June achievement scores as a basis.

Implications and Suggestions for Further Research

The present study on summer vacation retention offered the following implications for teachers:

1. The effect of summer vacation on newly acquired skills, especially comprehension skills, indicated that these skills need to be taught more thoroughly and in proper sequence.

2. Teachers should plan, teach, and review to encourage reading retention throughout the school year.

3. Primary grade teachers might find it beneficial to enlist parental cooperation and plan summer reading programs for their students.

4. Losses by top achievers in reading should indicate that teachers cannot assume that certain students will retain material learned.

5. Teaching for long-term retention should be considered more professional than teaching for short-term results.

Several questions were raised in the course of the present research which would justify further planned research:

1. Would statistical analysis of individual differences in retention based on June achievement scores yield the same results as the descriptive analysis relied on in this study?
2. How long would it be before the children regained lost reading skills, and would these skills be regained at the same rate?

3. Would a well-planned summer reading program be followed by students, be encouraged by parents, be beneficial to both vocabulary and comprehension skills, and be worth the time and effort devoted to it by the teacher?

4. Could one or more conditions known to affect retention be controlled in order to determine the factor which most influenced loss of retention of reading skills?

5. If writing, arithmetic concepts and computation, and social studies or science had been included in the research, would retention in reading have been greater than retention in the other subject areas?
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Additional Material


Unpublished Material

APPENDIX

PARENTAL QUESTIONNAIRE
Parental Questionnaire

September 3, 1970

Dear Parents,

The children who were in Grade Two last June received a standardized reading test to determine their achievement in reading. They are again being tested this September to determine if their reading skills were retained during the summer. The information from this testing procedure will be used as part of a research paper in connection with Cardinal Stritch College.

In order to insure accuracy in the results of the research, it is necessary that I find out which children, if any, received formal reading instruction during the summer. If your child did receive reading instruction during the summer, put a check next to the appropriate item. Please sign your name and your child's name and return the questionnaire to school. If your child received no reading instruction as listed here, just sign your name and your child's name and return the questionnaire to school.

Thank you for your cooperation. I would appreciate your returning this questionnaire by September 8.

Sincerely,
Mrs. Howard

___ summer school course in reading
___ summer school course in a subject that required some reading
___ tutoring during the summer

If you checked one of the above, please explain the kind of instruction received.

Parent's signature________________________

Child's name______________________________