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ABSTRACT

There is mixed evidence regarding the ability of students to retain reading ability over long, non-instructional periods such as the summer recess. In some instances there are significant losses in reading ability, while in other cases the losses fail to reach significance. However, in some cases, such as with basic visual discrimination tasks, gains may actually be made over the summer. The degree to which reading ability is retained may be directly related to the skill being assessed. General reading ability such as vocabulary and comprehension skills may be more apt to change over the summer than would be specific reading skills such as the ability to learn beginning consonants, short vowels, or compound words. Conflicting data make the role of intelligence in retention of reading ability unclear. Tn some instances it seems to be a significant factor while in other cases it seems to have a non-significant relationship. The sex of the student appears to have no significant relationship to the retention of reading ability over the summer. We must be careful to articulate what is meant when talking about reading ability, using the most appropriate statistical techniques to answer the questions of skill retention. (WR)

READING SKILL RETENTION

Robert L. Rude

Why is it that everyone, or nearly everyone, has an opinion about what happens to a student's reading ability over the summer recess? And, why is it that the question of reading skill retention can precipitate an argument in any teacher's lounge or college classroom? And, why is it that while we hold such strong opinions about this issue we are hard pressed to present objective data to support our contentions? The answer to these questions is relatively straight-forward! We have not expended the time or the resources necessary to arrive at adequate answers. This probably appears to be a simplistic answer to a complex issue. Further investigation into this issue, however, will support this position. The purposes of this paper, then, is to begin to look at what happens to a child's reading ability over extended periods of non-schooling, specifically, the summer recess.

To begin with, the term reading will be defined in two ways in this paper. First, there is what is sometimes called overall reading ability. Overall reading ability is what you measure when you assess a child's reading performance with a test like the California Achievement Test (20), the Iowa Tests of Basic Skills (9), or the Gates-MacGinitie Reading Tests (6); standardized reading tests in other words. Specific reading ability is what you get when you measure reading ability with tests such as the Prescriptive Reading Inventory (14), the Croft Inservice Reading Program (4), or the Wisconsin Tests of Reading Skill Development (22). These latter tests are commonly referred to as criterion-referenced or objective-based reading tests.

By now we are probably all aware of the strengths, as well as the limitations, of these instruments. And, since the focus of this paper is not on the issue of "do reading tests actually measure reading ability?" but on the issue of reading skill retention, let us purposely fake to the left and run to the right to avoid any psychometric questions which might develop concerning these instruments.

As all scholary investigators know, before undertaking any type of reading research we should thoroughly examine the previous efforts that have sought to shed light on the question under investigation. Several educators have attempted to re-

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solve the issue of retention of reading ability over extended periods of time.

Irmina (7) was one of the first to measure retention of reading ability. Measuring general reading ability, she concluded that word recognition ability of first and second graders was not seriously affected by the summer vacation period. Brueckner and Distad (1) examined the general reading retention ability of students in twelve first-grade classrooms and found that scores on one reading test were lower in September than in June while on another test there was no difference in scores. Morrison (10), after measuring the retention ability of reading skills of first, second and third graders, concluded that there was practically no change in their reading ability over the summer recess.

Elder (5) looked at older subjects; intermediate-grade students. One of his important findings was that the range of scores on the reading tests he used was greater in September than in May. Keyes and Lawson (8), again looking at older subjects, found that while reading scores did not decrease during the summer recess the gain was not as great as if the subjects would have received instruction during this time. While there are numerous other studies which could be cited here such as the ones by Parsley and Powell (13), Cook (2) (3), Orr (12), and Vergason (21), several overriding trends are evident in studies of summer retention of reading ability. First, only general reading ability has been measured using standardized tests. And, secondly, the relationship between intelligence and retention of reading ability is still unclear.

We should applaud the work of these earlier researchers since their investigations have provided us with initial insights into the area of retention of reading ability. Unfortunately, we are now living in the age of the criterion-referenced reading test, the age of reading diagnosis and prescription, and the age of self-pacing, individually-guided reading programs. What answers can these earlier studies provide? The answer is short and simple: they give us some preliminary insights into retention of general reading ability but they do not tell us much about retention of specific reading ability.

What then are we to do? Allow me to briefly describe some of the work that the writer and others have been involved in in an attempt to clarify this issue. While these data are

not conclusive and the samples used have been small, we may be on the right track. You will notice from the outset that the four studies to be mentioned all made use of criterion-referenced tests, while only two of the four made use of norm-referenced tests. This is a dramatic as well as a significant departure from past investigations exploring this topic. It is dramatic in the sense that this aspect of evaluation has heretofore been conducted only with standardized reading tests. It is significant in the sense that as a profession, we are finally able to measure reading achievement not only in broad, global terms but we can now analyze and reliably measure reading ability in terms of component skills (e.g., phonic and structural analysis skills as well as specified map and graph reading skills). This development is a result of the recent construction of criterion-referenced reading tests which attempt to break reading down into a series of more or less definable subskills.

With this limited background information, some of the findings of these investigations will be offered. Then, a description of some future efforts that are being undertaken in this area will be discussed, and finally, a few warning flags will be raised and some yet unresolved questions will be pointed out.

To begin with, two investigations conducted at the kindergarten level will be described. They were not elaborate, large-scale studies but they provided the germination for the studies which were to follow.

The first study attempted to determine what happens to reading readiness ability over the summer recess. It was conducted in a small midwestern resort community (16). Three kindergarten classrooms were administered six criterion-referenced reading tests, the Wisconsin Tests of Reading Skill Development: Word Attack (WTRSD: WA), Level A (22) just before school dismissed in the spring and again immediately upon resumption of school in the fall. The tests measured the following reading skills; rhyming words, rhyming phrases, shapes, letters and numbers, words and phrases, and initial consonants. All tests were administered by the student's regular classroom teachers.

TABLE 1

CHANGE RAW SCORES FOR KINDERGARTEN SUBJECTS

ON SIX WTRSD WORD ATTACK SUBTESTS

	Males (N=19)	Females (N=23)
Rhyming Words	.63	- 1.30
Rhyming Phrases	- .11	.04
Shapes	1.05	.22
Letters and Numbers	.05	- .26
Words and Phrases	1.58	.61
Initial Consonants	- .42	- .43

Briefly, when the spring and fall scores were compared, the findings could be summarized quite succinctly; no significant difference between the mean scores from the two testing sessions when the analysis of variance statistical treatment was applied. Sex of subject was also found not to be a significant factor when the retention ability between males and females was compared.

The second kindergarten retention study was more ambitious. In this investigation Rude, Niquette, and Foxgrover (18) examined the reading skill retention of 119 subjects from a northeastern Wisconsin school district. Ten kindergarten sections in three elementary grade schools were included. Three WTRSD:WA (22) and the Capital Letters subtest of the Murphy-Durrell Reading Readiness Analysis (11) were administered in February, May and September. Since the focus of this paper is on summer retention ability, only the May to September change scores will be reported here.

TABLE 2

CHANGE RAW SCORES FOR KINDERGARTEN SUBJECTS ON FOUR READING READINESS MEASURES (N=119)

WTRSD:WA - Shapes	1.32***
WTRSD:WA - Letters & Numbers	.41**
WTRSD:WA - Initial Consonants	- .50
MURPHY-DURRELL: Capital Letters	.56*

* p .05

** p .01

*** p .0001

With the exception of the Initial Consonant subtest, significant gains were achieved on all measures. On the Initial Consonant test there was a slight loss but it was not significant when the analysis of variance treatment was applied. Again, as in the first study reported, there was no significant difference in the retention of reading skills between males and females. Since intelligence quotient scores were available for all subjects, a univariate analysis of variance statistical treatment was performed; intelligence of subjects was found to be related to retention ability. The chronological age of subjects was not significantly related to retention ability, however.

The next investigation examined the reading skill retention of older, primary-grade students. In this study Rude and Niquette (17) tried to determine the degree to which both specific reading skills (as measured by criterion-referenced tests) and general vocabulary and comprehension ability (as measured by a norm-referenced, standardized reading test) were retained over the summer vacation. Similar testing procedures as those

TABLE 3

MEAN MALE, FEMALE, AND AVERAGE CHANGE SCORES
FOR FIRST, SECOND, AND THIRD GRADE STUDENTS

	MALES	FEMALES	AVERAGE
Grade 1			
Vocabulary	-1.71	.68	- .52
Comprehension	2.93	1.86	2.39*
Beginning consonants	-1.29	- .45	- .87
Consonant blends	- .14	- .68	- .41
Short vowels	- .14	- .59	- .37
Consonant digraphs	-1.14	.36	- .39
Compound words	-3.21	.36	-1.43
Base words	- .93	- .41	- .67
Grade 2			
Vocabulary	-1.00	- .22	- .61
Comprehension	-2.23	-1.22	-1.73
Consonant blends	- .85	- .67	- .76
Vowel + r, a + l, a + w	-1.62	- .33	- .98
Long and short oo	.77	- .33	.22
Base words	-1.00	-2.33	-1.67
Homonyms	- .31	- .11	- .21
Grade 3			
Vocabulary	-3.00	- .71	-1.86
Comprehension	-8.61	-5.86	-7.24
Sight vocabulary	.15	.14	.15
Consonant blends	.23	- .71	- .24
Silent letters	.08	- .57	- .25
Syllabication	- .31	- .29	- .30
Accent	-1.54	- .43	- .99

*p<.01

employed in the earlier studies were utilized. That is, all subjects were tested shortly before the summer recess began in the spring and within two weeks after school resumed in the fall. As previously mentioned, tests administered at the three grade levels included standardized as well as criterion-referenced reading tests. Alternate forms of the former instrument were used; the same form of the latter instrument was used since it was all that was available at the time of testing.

On sixty-six separate variables, only one significantly different change score was evident when the analysis of variance

TABLE 4

SUMMARY OF ANALYSIS OF VARIANCE OF CHANGE SCORES

Variable	df	Mean Squares	Univariate F	P
Gates-MacGinitie-Voc.	1	569.91	12.98	<.001
Gates-MacGinitie-Comp.	1	182.14	7.59	<.01
WTRSD-Sight Voc.	1	335.46	54.00	<.0001
WTRSD-Beginning Cons.	1	118.53	23.57	<.0001
WTRSD-Ending Cons.	1	274.16	31.27	<.0001
WTRSD-Cons. Blends	1	373.90	35.32	<.0001
WTRSD-Rhyming Elem.	1	1180.82	53.85	<.0001
WTRSD-Short Vowels	1	126.06	20.77	<.0001
WTRSD-Cons. Digraphs	1	842.91	119.84	<.0001
WTRSD-Compound Words	1	117.30	11.80	<.001
WTRSD-Contractions	1	449.76	41.42	<.0001
WTRSD-Base Words	1	11.96	1.23	NS
WTRSD-Plurals	1	.46	.09	NS
WTRSD-Possessives	1	8.84	.90	NS

treatment was applied; there was a significant gain on the combined male and female first-grade comprehension score ($p. < .01$). While there was a slight loss on most of the other measured variables, none of them reached statistical significance. Again, sex of subject was not found to be a significant variable affecting retention of reading ability.

On a much larger scale study, Rude (15) examined the effects of sex, intelligence, and school reading curriculum on the summer retention of overall reading ability and specific reading skills of first-grade subjects. Three hundred and eleven students from nine midwestern elementary schools constituted the sample. Approximately half of the subjects had been enrolled in an objective-based reading program while in first-grade; the other half had been instructed primarily with basal reader reading programs.

All subjects were administered the Gates-MacGinitie Reading Test (6) Primary A and the WTRSD:WA, Level B, (22) two weeks prior to and two weeks after the summer vacation period. In addition, the California Short-Form Test of Mental Maturity (CSFTMM) (19) was administered to all subjects during the spring testing session. Subjects with IQ scores which fell within the third and seventh stanines on the CSFTMM were not included in the data analysis.

When the multiple analysis of variance statistical treatment was used to analyze the data it was discovered that statistically significant differences were found between the mean spring and fall test scores on eleven of the fourteen measures. Sex of subject and type of school reading curriculum, however, were not significantly related to ability to retain either overall or specific reading ability.

TABLE 5

DIFFERENCE IN MEAN SPRING AND FALL TEST SCORES BY SEX, IQ, AND SCHOOL READING CURRICULUM CATEGORIES[1]

Variable	Sex		Intelligence			Curriculum	
	Males (N=153)	Females (N=158)	Below-Ave. (N=[illegible])	Ave. (N=[illegible])	Above-Ave. (N=163)	Basal Reader (N=51)	Objective-Based (N=260)
Gates-MacGinitie-Voc.	-1.84	- .69	- .40	-1.09	-1.13	- .84	-1.45
Gates-MacGinitie-Comp.	-1.57	.01	- .70	- .88	- .67	- .02	- .91
WTRSD-Sight Voc.	-1.41	- .68	-1.30	-1.28	- .82	- .45	-1.15
WTRSD-Beginning Cons.	- .54	- .70	.20	- .70	- .60	- .14	- .71
WTRSD-Ending Cons.	-1.09	- .80	-2.30	- .[illegible]	- .52	-1.18	- .89
WTRSD-Cons. Blends	-1.30	- .90	-3.0	-1.17	- .92	- .43	-1.23
WTRSD-Rhyming Elem.	-2.25	-1.65	-1.90	-3.01**	-1.05[a]	-1.57	-2.02
WTRSD-Short Vowels	- .73	- .54	.70	- .57	- .77	- .90	- .58
WTRSD-Cons. Digraphs	-1.80	-1.5	.[illegible][b]	-2.02[b]	-1.42	-1.49	-1.68
WTRSD-Compound Words	- .73	- .51	-1.20	- .99	- .26	- .31	- .67
WTRSD-Contractions	-1.43	- .98	- .30	-1.46	-1.04	-1.27	-1.19
WTRSD-Base Words	- .21	.59	2.03	- .19	.33	.66	.06
WTRSD-Plurals	- .10	.02	-1.00	[illegible]	- .01	.22	- .03
WTRSD-Possessives	.29	.04	-1.10	.09	.[illegible]1	1.37	- .07

*p<.05
**p<.01

[a] Post hoc Scheffe procedure to determine significance between Average and Above-Average groups
[b] Post hoc Scheffe procedure to determine significance between Below-Average and Average groups
[1] ANOVA Tables can be found in the

By now these data are probably bewildering and confusing. To add a further dimension to this confusion, another factor should be pointed out. Up to this point, all of the reported studies using criterion-referenced measures have used sampling statistics as the major method of analysis. To illustrate that a different light can be shed on the last reported study, let us examine the findings using descriptive statistics rather than sampling statistics. Instead of examining the data in terms of the significance of mean change scores, let me examine how the number of students considered to be masters of a skill (using an arbitrary eighty percent or higher score on a test as a criterion) in the fall compares to the number of students considered to be masters in the fall. Rather than examining all twelve of the criterion-referenced change scores which were analyzed in this last study, let us confine our survey to three representative tests; the WTRSD:WA Beginning Consonants tests, the Short Vowel test, and the Compound Words test.

First, let us examine the changes in the scores of subjects who were enrolled in a criterion-referenced reading program during the first grade. The percentage of males of average intelligence who were masters of these skills in the spring was about fifteen percent higher than in the fall. The above-average male group exhibited less of a trend. Between four and seventeen percent of the females of average and above-average intelligence needed to be recategorized as nonmasters of these same skills in the fall of the year.

TABLE 6

PERCENTAGE OF STUDENTS NEEDING TO BE RECATORGORIZED BETWEEN SPRING AND FALL TESTING SESSIONS IN THE OBJECTIVE-BASED READING CURRICULUM

Tests	Average Intelligence		Above-Average Intelligent	
	Males	Females	Males	Females
WTRSD:WA - Beginning Consonant	-16	-4	-5	-6
WTRSD:WA - Short Vowels	-12	-14	-12	-17
WTRSD:WA - Compound Words	-16	-13	+5	-9

In the basal reading curricula group the percentage of
ales of average intelligence considered to be masters of
ne skills in the fall compared to the spring actually in-
reased between eight and twenty-four percent. There was
ittle change in the male above-average intelligence group.
he percentage of females of average intelligence did not

TABLE 7

PERCENTAGE OF STUDENTS NEEDING TO BE RECATORGORIZED
BETWEEN SPRING AND FALL TESTING SESSIONS
IN THE BASAL READER CURRICULA

	Average Intelligence		Above-Average Intelligence	
	Males	Females	Males	Females
TRSD:WA - Beginning Consonants	+24	-17	No Change	-9
TRSD:WA - Short Vowels	+8	+16	-8	-10
TRSD:WA - Compound Words	+8	-16	No Change	-4

ndicate a specific trend. The percentage of subjects needing to
e recategorized either increased or decreased about sixteen
ercent between the spring and the fall. The percentage of
bove-average intelligence females in the basal reader curricula
roup needing to be recategorized as nonmasters in the fall was
etween four and ten percent.

It could be concluded then, that even though statistically
ignificant lossess occurred between spring and fall test scores
he most meaningful measure of change, in a pedagogical sense
t least, was the relatively small difference between the per-
entage of subjects considered masters of the skills in the
pring versus those in the fall. After all, this is what

teachers need to be concerned with. When the change in the percentage of masters was considered between the two testing sessions, approximately fifteen percent of the subjects changed from being considered masters to nonmasters or vise versa. This means that in a typical first-grade classroom of twenty-five students, only four would have to be retested on a specific skill test in the fall of the year. This represents a modest number of students and would pose no major alterations in a teacher's existing testing program.

Summary

What does this all mean? I think five conclusions are warranted from what we presently know about beginning readers' ability to retain reading skills over the summer recess.

First, there is mixed evidence regarding the ability of subjects to retain reading ability over long non-instructional periods. In some instances, there are significant losses in reading ability while in other cases, the losses fail to reach significance. And, in some cases, such as with basic visual discrimination tasks, there may actually be gains made over the summer.

Secondly, the degree to which reading ability is retained may be directly related to skill we are assessing. General reading ability such as vocabulary and comprehension skills may be more apt to change over the summer than would be specific reading skills such as the ability to learn beginning consonants, short vowels, or compound words.

Thirdly, conflicting data make the role of intelligence in retention of reading ability unclear. In some instances it seems to be a significant factor while in other cases it seems to have a non-significant relationship.

Fourth, sex of the subject appears to have no significant relationship to the retention of reading ability over the summer.

Fifth, and finally, we must be careful to articulare what we mean when we talk about reading ability and then use the most appropriate statistical techniques to answer the question of skill retention. As was illustrated in the final study reported, the statistical technique can bear directly upon the outcomes, conclusions, and pedogogical implications of the investigation.

In conclusion, let me briefly mention a further investigation that is being undertaken in an attempt to gain deeper insights into the area of reading skill retention. Otto, Klumb, and Rude are presently analyzing the data collected from a large sampling of students located across the United States. They are attempting to pinpoint the skill growth and retention patterns of approximately 1,200 primary grade students in Connecticut, Illinois, Minnesota and Wisconsin. Hopefully, these data will shed more light on the important questions of reading skill retention. Until these data are reported, however, skill retention will continue to be an issue in early reading instruction.

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