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ABSTRACT
        The purpose of this study was to determine if
differences existed between second- and fifth-grade students' word
recognition errors, and if differences existed between the word
attack strategies utilized by them. Using the Informal Reading
Inventory, a random sample of twenty-five second graders and
twenty-five fifth graders was taken from three middle-class
metropolitan schools. The types of word recognition errors were
classified according to criteria the researcher had established and
then converted into proportions. Differences between the second- and
fifth-grade subjects' errors were tested at the .01 level using the z
test. The results indicated that second and fifth graders made
similar types of word recognition errors during oral reading, with
the following exceptions: (1) second graders had more words given by
the examiner, (2) fifth graders confused the initial consonant more
frequently, and (3) fifth graders made more meaningless guesses. Both
groups tended to use initial clues combined with syntax and semantics
as a primary aid to word recognition. (Author/LL)

TITLE — TYPES OF WORD RECOGNITION ERRORS
MADE BY SECOND AND FIFTH GRADE STUDENTS

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TYPES OF WORD RECOGNITION ERRORS
MADE BY SECOND AND FIFTH GRADE STUDENTS

ABSTRACT

Although some research has dealt with the types of word recognition
errors made by children, it has been largely confined to first grade youngsters.

The purpose of this study was to determine if differences existed
between second and fifth grade students' word recognition errors, and if
differences existed between the work attack strategies utilized by them.

The testing instrument used was an Informal Reading Inventory
developed by the researcher and containing levels of readability from primer
through the ninth grade. Comprehension questions were of three types --
literal, inferential, and critical evaluation. A pilot study was conducted
to establish a coefficient of stability for word recognition and validity
for the comprehension questions.

A random sample of twenty-five second and twenty-five fifth
graders was taken from three middle-class metropolitan schools to whom the
Informal Reading Inventory was administered by the researcher and two
trained examiners.

The types of word recognition errors were classified according to
criteria the researcher had established and then converted into proportions.
Differences between the second and fifth grade subjects' errors were tested
at the .01 level using the z test.

Generally speaking, second and fifth graders made similar types
of word recognition errors during oral reading. However, there were ex-
ceptions such as (1) second graders had more words given by the examiner,
(2) fifth graders confused the initial consonant more frequently, and (3)
fifth graders made more meaningless errors. Further findings regarding
strategies of word attack and use of syntax and semantics are discussed.

Both groups tended to use initial clues combined with syntax and semantics as a primary aid to word recognition.

Implications and teaching strategies for the classroom teacher are discussed and suggestions for further research given.

TYPES OF WORD RECOGNITION ERRORS
MADE BY SECOND AND FIFTH GRADE STUDENTS

The Problem

Word recognition skills and particularly phonics has been a
debatable issue since the early 1900's. One could almost trace the
history of the teaching of reading in this country by following the role
that phonics and other word recognition skills have played in the
teaching of reading. The problem has reached the point where it is
almost a journalistic issue. Authorities, depending upon their biases,
cite research to support their position which may vary from advocating
a very strong synthetic phonics approach to advocating an analytic
phonics approach. At this time there does not appear to be any authority
who advocates the elimination of phonics instruction.

Thus far, the research dealing with phonics could be
summarized by stating that the findings of experimental studies suggest
that programs emphasizing synthetic phonics tend to produce students who
can pronounce words better but may not comprehend as well as students
subjected to a reading program that does not stress synthetic phonics.
However, these findings should not be viewed as being detrimental to
synthetic phonics, but rather they may suggest that teachers who stress
phonics tend to ignore the teaching of comprehension skills, and as a
result, the students are not as skillful in deriving meaning from what
they read. Such a situation could possibly be overcome if teachers
would place equal stress upon both phonics and comprehension.

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Although phonics is an important word recognition skill, it is only one of five basic word analysis skills -- the others being visual clues (configuration), context clues, tructural analysis, and dictionary usage. These skills all have a place in a good reading program, but their significance should be kept in proper perspective. They are a means to an end, and the end is that the child will be able to analyze a word frequently enough so that the word eventually becomes a sight word.

Just which of the word analysis skills is the most important or is a combination of the skills more useful is still a debatable issue. What word attack strategies do children use in reading and how these strategies change as the child acquires reading ability are still unanswered by the present research.

One method of investigating word attack strategies is to study the types of word recognition errors children make in oral reading. This type of research has become of more interest to reading authorities since the late 1950s . The majority of the research in this area has been conducted at the first grade level, and the researchers have attempted to identify the progressive change in word recognition strategies that were developed by children as they learned to read. Dr. Jeanne Chall stated in a review of these studies, "The implications of these kind of error data for understanding the beginning reading process and for the diagnosis and teaching based on individual needs are enormous"[3, pp. 565-566]

It was with that thought in mind that the present study was pursued. Findings regarding the most common types of word recognition errors committed by second and fifth grade students during oral reading

might provide the classroom teacher with information with which to plan a more successful developmental reading program. It would possibly provide some insight into word recognition strategy utilized by second and fifth grade students; and if there is a difference between the two, it would provide educators with additional insight into how children learn to read.

Review of the Literature

A comparatively recent study conducted by Weber was reported in Chall's article[7, pp. 563-564]. She summarized past research on oral reading errors and reported that in all of the research that she (Weber) investigated the interest was in words as visual displays rather than written words considered as linguistic units represented graphically. In the discussion of word recognition errors, very little consideration was given to the reader's knowledge of the grammatical structure of his language during reading.

Weber's own study of the errors made by twenty-one first graders who were taught with a regular basal reading program (Scott-Foresman) considered several linguistic levels:

1. The words match with the stimulus as a graphic display.

2. Its morphological structure relative to that of the stimulus.

3. Its syntatic function in a phrase as indicated by its part of speech.

4. Its syntatic acceptability in the sentence.

5. Its semantic appropriateness to the meaning of the entire passage.

Full stops (non-recognitions), hesitations and repetitions were not
counted as errors.

Weber discovered that substitution of one word for another
comprised eighty percent of the total reading errors made by her sample
of first graders. Omissions and insertions constituted ten percent,
and reversals and scrambles of words made up less than three percent.

When substitution errors were classified on an index of graphic
similarity such as identical letters, position of identical letters,
and length, she found that the more capable readers had a higher index
of graphic similarity than the less capable readers. In a comparison
of errors over a period of time, both the high and low groups showed an
increase in the degree to which their word recognition substitutions
were similar to the stimulus words.

In a comparison between the grammatical correctness of the
substitution, ninety-one percent of the substitutions were judged to be
grammatically correct with the preceeding context, and sixty-four
percent were judged to be grammatically correct in terms of the entire
sentence.

For sentences that remained grammatically correct with the
substitution, ninety-three percent were found semantically appropriate
up to the point of the error, and sixty-eight percent semantically
appropriate in terms of the entire selection.

Weber also discovered an interaction between the use of
graphic clues and contextual clues (syntactical and semantic). The
higher the graphic similarity of the error, the lower its contextual
appropriateness. Also, grammatical acceptability and semantic

appropriateness tended to decrease with time, suggesting the increasing

ability of the children to respond to the words in terms of sound-letter

correspondence.

Weber concluded the following concerning strategies used by

first graders:

> This analysis of errors of the syntactic and semantic
> analysis of errors on the semantic levels suggest that
> even early readers can successfully make use of preceeding
> verbal context; it is clear that they do not depend solely
> on graphic representation to make a response. Reading
> instruction might well incorporate guidance on the
> optimal balance in use of correspondences between sounds
> and letters and the expectations transferred from verbal-
> experience. However, this description leaves us far
> from discerning what the optimal balance might be[7, p. 64].

Another study reported by Chall and conducted by Biemiller

was similar to Weber's in that it was a study of oral reading errors

made by first graders who also learned to read in a basal reader

program. However, he counted non-recognitions as errors[2, pp. 564-565].

Biemiller's study indicated that his first graders tended to

make a progression in the types of errors made at the beginning and

the end of first grade. He divided these into three major phases. The

first phase was characterized by a preponderance of substitution

errors that suggest a heavy reliance upon context. The second phase was

characterized by the majority of the errors being non-responses. The

third phase was characterized by greater flexibility in strategies used

to identify words.

His findings indicated that some children remained at the first

phase all year long and these children were the poorest readers at the

end of the year. The better readers reached the second phase earlier

and continued on to the third phase at a much more rapid pace.

Although both Weber's and Biemiller's studies are helpful in our understanding of how children read, further research is needed.

The present study was initiated in order to discover the answers to the following questions:

1. What are the types of word recognition errors most commonly made by second grade students while reading materials at different levels of readability?

2. What are the types of word recognition errors most commonly made by fifth grade students while reading materials at different levels of readability?

3. Is there a difference in the type of word recognition errors made by second and fifth grade students?

4. What strategies of word attack do second and fifth graders use and is there a difference between them?

Procedures of the Study

The Population

The population used for the study contained all of the second and fifth grade students in three middle class elementary schools. Those grades were chosen to permit a comparison between primary and intermediate grade children.

For the most part the pupils came from average middle-class homes. The greatest percentage was Anglo (89%); however, there was a comparatively large percentage of Mexican-Americans (8%) and a very small percentage of Negroes (1%), Chinese (<1%) and Papago Indians (1%).

As a part of the school district-wide testing program, all students in the elementary schools were given the Stanford Achievement test during the month of March. The S.R.A. Primary Mental Abilities Test was also administered to first, third, and fifth graders. Table I gives the mean scores achieved by the population on each of these tests. The I.Q. mean score for the second grade was computed from test scores taken during the first year in school.

Table I Description of Population: Sex, Mean C.A.,
Mean I.Q., Range and Mean Scores for
Stanford Achievement Test

Grade	No.	Sex B	Sex G	$\overline{X}$ C.A.	$\overline{X}$ I.Q.	Wd Mean. Mean	Wd Mean. Range	Par Mean. Mean	Par Mean. Range	Wd St Skills Mean	Wd St Skills Range
2	253	127	126	7-10	106	2.6	1.2- 6.9	2.5	1.2- 6.9	3.0	1.1- 7.5
5	302	151	151	11-0	106	5.4	1.7- 9.5	5.4	1.5 11.2	-	-

These findings suggested that the population of second and fifth grade students was comparatively evenly divided between boys and girls, and they did for the most part fall into the average range of intelligence.

When comparing the population of second graders to others of their own age, their mean score for word meaning was 2.6 which was exactly as it should have been for the time of year the test was taken. The mean score for paragraph meaning was one month below and the mean score for word study skills was four months above the grade norm.

These findings suggested that the second grade populations reading ability was basically average.

When comparing the population of fifth graders to others their own age, the mean score of 5.4 for word meaning and paragraph meaning was somewhat below the expected grade norm of 5.6. However, the difference was not great enough to sug est that they were experiencing extreme difficulty in reading.

Types of Reading Programs

Although the population for the study drew from three different schools, including nine second grade teachers and ten fifth grade teachers, the reading programs were somewhat similar. The basic program was centered around a Basal Reader approach which was combined with a Language Experience approach at the first grade level. The latter approach was only continued at the second grade level with students who had difficulty in making normal progress. Fifth grade students had been subjected to several basal reader series none of which had been used continuously over a period of years. Teachers had followed the program as outlined in the teacher's manual only when they had felt it necessary. Second grade students had been subjected primarily to one basal series, but others had been used as supplementary material. There was seemingly more continuity and coordination in the second graders' reading program.

Samples

The samples for the study were composed of twenty-five second
and twenty-five fifth grade students randomly chosen from the entire
second and fifth grade populations of the three schools. The students
used in the pilot study were not included in the sampling.

The Testing Instrument

An Informal Reading Inventory (I.R.I.) was developed by the
investigator containing an oral and silent reading selection for the
readability levels of primer through ninth grade. These selections were
carefully selected for the familiarity the students would have with the
concepts and for level of readability. The Spache[6] and Dale-Chall[4]
formulas were used to establish readability of the passages.
Comprehension questions of literal recall, inference, and evaluation
were composed for each selection. Barrett's taxonomy was used to
define the different types of questions[1, pp. 19-23]. The I.R.I.
was then evaluated by two judges both of whom had extensive background
in the field of reading. The evaluation was designed to examine the
suitability of the selections (interest and familiar concepts) and
the comprehension questions. All suggested revisions were made, and
the I.R.I. was administered to five second and five fifth grade students
chosen at random from the population. The purpose of the pilot study
was to establish a coefficient of reliability and to determine if the
selections and questions were appropriate. After three weeks, the
I.R.I. was again administered to the same subjects. The coefficient
of reliability for the two testings were .943 for word recognition

and .990 for comprehension. It was also concluded that the selections were generally of interest and the concepts were familiar to the majority of the subjects. Any question not answered correctly by at least one subject was considered unsuitable. There were several questions that did not meet this criterion and some seemed ambiguous in their wording. Each of the doubtful questions was examined by the judges and the researcher and all necessary changes were made.

Administration and Scoring of the I.R.I.

In order to shorten the time needed to gather the research data and to eliminate researcher bias, two other examiners with extensive background in reading were trained and utilized in the administration of the Informal Reading Inventory. The subjects were randomly assigned to the examiners, and the administration of the I.R.I. was made as uniformly as possible. All subjects began with a practice selection at the primer level to make certain they knew what was expected of them. Actual, testing began at the primer level of readability and continued until the subject had two consecutive levels where either his word recognition was eighty-five percent or less, or his comprehension was fifty percent or less. This provided a healthy psychological situation for the subjects and still provided the necessary information sought by the researcher.

The word recognition percentage was computed from the oral selection. Mispronounced words, omitted words, inserted words, words that were reversed such as be to for to be, and words provided by the examiner after a ten second delay were considered word recognition errors.

However, any of these five types of errors that were corrected by the subject and mispronounced words that were considered to be a result of the subject's dialect were not scored s errors.

The comprehension score was computed from the silent reading selection and all questions were assigned equal weight. Partial answers were scored according to the amount of correctness. For example, if the question required an answer containing two parts and the subject only gave one, the question was scored as being half correct.

In order to make certain the scoring was uniform, all tests were scored by all three examiners and questionable scoring was resolved.

The Hypotheses for the Study

The following research hypotheses were tested:

1. The types of word recognition errors made by second graders will differ from those made by fifth graders.

2. Fifth graders' word recognition substitutions will tend to fit the syntax and/or semantics of the sentence more often than those substitutions made by second graders.

Data Analysis and Findings

Analysis Procedures

In order to analyze the types of word recognition errors made by the second and fifth grade subjects, it was necessary to develop the following criteria for word recognition errors:

1. <u>Words Given by the Examiner</u> are words which the subject hesitated over for a period of ten seconds and was given

to the subject by the examiner or words asked for by
the subject.

2. Insertions are words rea.. into the selection that were
not a part of it.

3. Omissions are words that were omitted by the subject as
he read orally.

4. Reversed Word Sequence is the reversal of word sequence
such as be to for to be.

5. Reversed Letters are the reversals of letters such as
b and d that result in a mispronounced word.

6. Reversed Words are reversals of words such as was for saw
that results in a mispronounced word.

7. Overdependence on Configuration is the substitution of one
word for another, and the substituted word resembles
the correct word in configuration such as bad for lot.

8. Overdependence on Initial Clues is the substitution of one
word for another, and the substituted word has the same
initial letter as the correct word but differs in other
ways such as same for Susan.

9. Overdependence on Final Clues is the substitution of one
word for another, and the substituted word has the same
final consonant letter as the correct word but differs
in other ways such as sit for get.

10. Confusion of Initial Consonants is the substitution of one
word for another, and the substituted word is the same as

the correct word except for the initial consonant letter
such as <u>bent</u> for <u>went</u> or <u>dried</u> for <u>tied</u>.

11. <u>Confusion of Final Consonants</u> is the substitution of one
word for another, and the substituted word is the same as
the correct word except for the final consonant letter such
as <u>bad</u> for <u>bat</u>.

12. <u>Confusion of Inflectional Endings</u> is the substitution of
one word for another, and the substituted word is the same
as the correct word except for the inflectional ending
such as <u>calls</u> for <u>called</u> or <u>call</u> for <u>calls</u>.

13. <u>Confusion of Consonant Clusters (Blends)</u> is the substitution
of one word for another, and the substituted word is similar
to the correct word except for the initial or medial cluster
such as <u>cluck</u> for <u>truck</u> or <u>his</u> for <u>this</u>.

14. <u>Confusion of Hard or Soft c</u> is the substitution of one
word for another, and the substituted word is pronounced
in a way that indicates a confusion of the hard and soft
sound of <u>c</u> such as <u>cent</u> for <u>cat</u>.

15. <u>Confusion of Hard and Soft g</u> is the substitution of one
word for another, and the substituted word is pronounced
in a way that indicates a confusion of the hard and soft
sound of <u>g</u> such as <u>get</u> for <u>jet</u>.

16. <u>Confusion of Short Vowels</u> is the substitution of one word
for another, and the substituted word is the same as the
correct word except for the short vowel such as <u>want</u> for <u>went</u>.

17. <u>Nonrecognition of Final e</u> is the substitution of one word for another, and the substituted word is mispronounced with a short medial vowel rather than a long vowel that is the result of the final <u>e</u> such as <u>kit</u> for <u>kite</u>.

18. <u>Nonrecognition of Diphthongs</u> is the substitution of one word for another, and the substituted word is mispronounced because of the use of the incorrect diphthong or vowel such as <u>bit</u> for <u>boil</u>.

19. <u>Nonrecognition of Vowel Diagraphs</u> is the substitution of one word for another, and the substituted word is mispronounced because of the use of an incorrect diagraph such as <u>got</u> for <u>goat</u>.

20. <u>Nonrecognition or Confusion of r Controlled Vowels or Vocalic rs</u> is the substitution of one word for another, and the substituted word is pronounced in a manner that suggests either a confusion of or nonrecognition of <u>r</u> controlled vowels or the vocalic <u>r</u> such as <u>car</u> for <u>care</u> or <u>bid</u> for <u>bird</u>.

21. <u>Meaningful Guesses</u> is a word substituted for the correct word that seems to be a guess by the subject but fits the syntactical and semantic pattern of the sentence such as <u>went</u> for <u>gone</u>.

22. <u>Meaningless Guesses</u> is a word substituted for the correct word that seems to be a guess by the subject and does not fit the syntactic and semantic pattern of the sentence such as <u>store</u> for <u>meadow</u>.

The results of the scores for word recognition and compre-
hension for both second graders and fifth graders are contained in
Table II and Table III.

Table II   Range, Median, and Mean Scores of Word Recognition
and Comprehension for Second Grade Subjects Based
on Results From an I.R.I.

Level	N	W.R.Rng.	Comp.Rng.	W.R.M.	Comp.M.	W.R.$\overline{X}$	Comp.$\overline{X}$
P	25	88-100	30-100	98.5	61.4	97.7	75.2
1	25	64-100	10-80	93.3	31.4	92.3	44.4
2	25	34-100	0-80	93.8	31.3	83.5	38.6
3	14	82-100	15-70	96.5	40.5	95.9	39.3
4	8	93-100	0-65	95.5	31.5	96.9	46.9
5	6	88-98	20-60	89.5	40.5	94.5	39.2
6	4	92-98	20-55	96.5	30.5	95.6	35.0

Table III   Range, Median, and Mean Scores of Word Recognition
and Comprehension for Fifth Grade Subjects Based
on Results from an I.R.I.

Level	N	W.R.Rng.	Comp.Rng.	W.R.M.	Comp.M.	W.R.$\overline{X}$	Comp.$\overline{X}$
P	25	94-100	30-100	96.9	71.3	99.1	78.4
1	24	78-100	10-90	99.6	31.4	98.1	48.8
2	24	68-100	30-100	98.2	60.5	97.6	60.4
3	21	94-100	30-100	98.6	60.9	98.0	61.7
4	20	95-100	20-100	99.2	60.8	98.9	65.0
5	25	25-100	0-90	96.2	45.7	92.3	46.4
6	15	84-100	25-95	96.3	65.7	95.2	64.3
7	13	94-100	25-100	97.7	51.0	97.6	57.7
8	12	93-100	25-65	97.5	45.0	97.3	46.7
9	10	86-99	10-59	93.5	26.5	93.3	31.5

The findings contained in Tables II and III indicate that
generally speaking both the second and fifth grade subjects maintained
good word recognition scores but had difficulty in comprehending what
they read. This was particularly noticeable when all twenty-five
second grade subjects and all twenty-five fifth grade subjects read
their respective grade level material.

Each of the word recognition errors made by the subjects during
oral reading was analyzed and classified according to the criteria
previously described. In order to check the validity of the researcher's
classifications, ten second and ten fifth grade subjects were randomly
chosen from the fifty subjects. The word recognition errors made by

those subjects were analyzed and classified by one of the judges used

previously in the study. The researcher's and judge's classifications

showed a 99.2 percent agreement.

The frequencies of the various types of errors were then

converted into percentages. Differences between the second and fifth

grade subjects' proportions were tested for significancy by utilizing

the Z test[5, pp. 148-149]. Those results are contained in Table IV.

Probability levels of .10, .05, and .01 were reported. However, only

the .01 probability was considered significant and those findings

discussed.

Table IV Comparison Between the Second and Fifth Grade
Subject's Word Recognition Errors

Word Recognition Errors	2nd Grade		5th Grade		% Diff	P
	Errors	%	Errors	%		
1. Word given by examiner	190	32.2	90	15.4	17.8	<.01
2. Insertions	21	3.6	36	6.1	-2.5	<.05
3. Omissions	65	11.0	72	12.3	-1.3	>.10
4. Reverses word sequence	3	0.5	1	0.2	0.3	>.10
5. Reverses letters	0	0.0	1	0.2	-0.2	>.10
6. Reverses words	5	0.8	1	0.2	0.6	>.10
7. Overdependence on configuration	0	0.0	3	0.5	-0.5	>.10
8. Overdependence on initial clues	123	20.8	133	22.7	-1.9	>.10
9. Overdependence on final clues	6	1.0	5	0.9	0.1	>.10
10. Confusion of initial consonants	7	1.2	24	4.1	-2.9	<.01
11. Confusion of final consonants	2	0.3	7	1.2	-0.9	>.10
12. Confusion of inflectional engings	23	3.9	42	7.1	-3.2	<.05
13. Confusion of consonant clusters	23	3.9	18	3.1	-0.8	>.10
14. Confusion of hard and soft c	0	0.0	0	0.0	0.0	>.10
15. Confusion of hard and soft g	0	0.0	0	0.0	0.0	>.10
16. Confusion of short vowels	29	4.9	21	3.6	1.3	>.10
17. Nonrecognition of final e	0	0.0	4	0.7	-0.7	>.10
18. Nonrecognition of diphthongs	6	1.0	11	1.9	-0.9	>.10
19. Nonrecognition of vowel diagraphs	5	0.8	2	0.3	0.5	>.10
20. Nonrecognition or confusion of r controlled vowels or vocalic rs	2	0.3	0	0.0	0.3	>.10
21. Meaningful guesses	39	6.6	38	6.5	0.1	>.10
22. Meaningless guesses	41	6.9	77	13.1	-6.2	<.01

An inspection of Table IV revealed that the second graders
seemed to have little difficulty with the various phonic skills tested
during oral reading. Although they did seem to have some difficulty
with short vowels, consonant clusters, and inflectional endings, the
percentages were not great enough to be considered as an indication
of severe difficulty. However, if they had not achieved such a high
percentage of error by waiting for the examiner to tell them words,
their errors might have revealed weaknesses in many phonic skills.

When the second graders did attempt a word, they seemed to
rely primarily upon the initial consonant or to guess. They made almost
as many meaningless guesses as they did meaningful guesses. The
comparatively high percentage of omissions suggested that they may
have made a conscious effort to avoid a word they could not pronounce.
However, further examination of those errors suggested that they were
predominantly the result of carelessness.

Further inspection of the findings revealed that the fifth
grade subjects also seemed to have little difficulty with the various
phonic skills tested during oral reading. There was some indication that
they experienced difficulty with initial consonants, consonant clusters,
and short vowels. However, even though the percentages of error were
greater for those skills they were not great enough to be considered
indications of extreme difficulty.

The fifth graders seemed to rely primarily upon the initial
consonant or guessing as a means of coping with an unknown word and,
it was surprising to note that they made a greater number of meaning-
less guesses than meaningful ones. The overdependence upon the initial

consonant may have also contributed to their difficulty with inflec-
tional endings. Although they too omitted many words, further examina-
tion of errors suggested that they were primarily due to carelessness.

In comparing the types of errors made by second grade subjects
with those made by fifth grade subjects, most of the differences in
percentages were not statistically significant at the .01 level.
The greatest difference was with the number of words given by the
examiner. The lower percentage for the fifth graders may have been
the result of less reluctance to attack unknown words. It is doubt-
ful that it represents improved skill in the use of phonics because
the percentage of errors for initial consonants was significantly
greater. Further evidence that suggested that the fifth grader's
skill in attacking words may not have been vastly improved lay in the
area of meaningful and meaningless guesses. The combined percentage
for those two areas nearly equaled the percentage of overdependence
upon initial clues. Furthermore, there was a statistical difference
at the .01 level when the meaningful guesses for fifth graders were
compared to their meaningless guesses. A difference also existed
when the meaningless guesses for second grade subjects were compared
to those of the fifth grade subjects thus suggesting that the tendency
to guess at unknown words increased with maturity particularly when it
seemed that other functional phonic skills were not in the student's
repertoire of word recognition skills.

In order to answer the second research hypothesis and to gain
further insight into the subject's use of syntax and semantics, word
recognition errors that are actual substitutions of one word for

another were analyzed using the following criteria:

1. Did the substitution fit the syntax but not the semantics of the sentence?

2. Did the substitution fit the semantics but not the syntax of the sentence?

3. Did the substitution fit both the syntax and the semantics of the sentence?

4. Did the substitution fit neither the syntax nor the semantics of the sentence?

The frequencies of the previously described substitutions were converted into percentages and differences were tested for significance using the Z test[5, pp. 148-149]. The results are contained in Table V.

Table V Comparison Between the Second and Fifth Grade Subjects' Word Recognition Substitutions

Criteria	2nd Grade		5th Grade		% Diff.	P
	Sub.	%	Sub.	%		
1. Substitution fit syntax alone	212	67.1	289	74.1	7.0	<.01
2. Substitution fit semantics alone	29	9.2	6	1.5	7.7	<.01
3. Substitution fit both syntax and semantics	146	46.2	151	38.7	7.5	<.10
4. Substitution fit neither syntax nor semantics	75	23.7	95	24.4	0.7	>.10

The data in Table V indicated that fifth graders tended to make more use of syntax than second graders in substituting one word for another in oral reading. When semantics were considered alone, the second grade subjects tended to make more substitutions that agreed with the semantics of the sentence. However, when the substitutions were analyzed with respect to their agreeing with both the syntax and the semantics there was no statistical difference. Twenty-four percent of the substitutions made by either the second grade or fifth grade subjects did neither agree with the syntax nor semantics of the sentence.

On the basis of the previously discussed evidence, the first research hypothesis that second grader's word recognition errors were different from fifth graders would be accepted. However, the second research hypothesis that fifth grader's word recognition substitutions tend to fit the syntax and/or semantics of the sentence more often than those of second graders would be rejected.

Summary, Conclusions, and Implications

Within the limitations of the study the following results, conclusions, and educational implications were derived.

Results

Generally speaking, second and fifth graders made similar types of word recognition errors during oral reading. However, there were three exceptions -- (a) second graders had more words given by the

examiner, (b) fifth graders confused the initial consonant more frequently, and (c) fifth graders made more meaningless guesses.

Second graders tended to rely primarily upon three means of attacking a word. These were in order of the frequency of occurrence, (a) waiting for the word to be given by the examiner, (b) using the initial clues, and (c) guessing. The guesses were almost evenly divided between meaningful and meaningless.

Fifth graders tended to rely primarily upon three means of attacking a word. These were in the order of the frequency of occurence, (a) using the initial clues, (b) guessing, and (c) waiting for the word to be given by the examiner. They made significantly more meaningless guesses than meaningful ones.

The results related to the use of syntax and semantics indicated that the word substitutions made by second graders during oral reading tended to fit the syntax of the sentence less frequently than did those of the fifth graders. However, when semantics was considered alone, the second graders' word substitutions tended to fit the meaning of the sentence more frequently than did those of the fifth graders. The number of word substitutions that fit both the syntax and semantics of the sentence were approximately the same for second and fifth graders, and about an equal number of word substitutions made by second and fifth graders did not fit either the syntax or the semantics of the sentence. However, when the use of syntax was compared to the use of semantics, both groups tended to make more use of syntax than semantics.

Conclusions

1. Both groups tended to use the syntax and semantics of their language as a model in attempting to recognize words while reading, thereby suggesting that the language of the child serves to set expectancies that assist in word recognition.

2. Both groups tended to utilize the syntax of their language more than the semantics which possibly contributed to the consistently low scores in comprehension.

3. Both groups tended to rely primarily upon initial clues plus syntax and semantics as an aid to word recognition, and this seemed to be a successful strategy since they maintained comparatively high scores in word recognition.

4. Both groups tended to guess a great percentage of the time when attacking unknown words rather than applying word attack skills, suggesting that they had few functional phonics and structural analysis skills, or they resorted to an easier method of attack.

5. Second graders tended to be less willing to attack unknown words thereby suggesting that they possibly did not have functional phonics and structural analysis skills, or they had been conditioned to having unknown words supplied to them.

6. Fifth graders tended to make less use of semantics and made more meaningless guesses than second graders which may have reflected the more difficult level of material or less concern about reading for meaning.

Educational Implications

The following suggestions are made for classroom teachers regarding reading instruction.

1. Although the word attack strategy of utilizing the initial clues plus context (semantics and syntax) proved to be effective for both second and fifth graders, other visual clues and sound-symbol relationships should be taught to assist the student in delimiting the number of words from which he has to choose when confronted with an unknown word. Emphasis upon these skills may tend to discourage the habits of waiting for a word to be supplied or guessing.

2. Instruction in word recognition should emphasize the use of a combination of skills (cues) or a strategy rather than using one skill and disregarding all of the others. The use of context clues (semantics and syntax) should be taught in conjunction with phonics and structural analysis as an aid to and a check upon word recognition. Students should be encouraged to not only use the context clues that precede the unknown word, but also those that follow in order to set word recognition expectancies. This can be best accomplished by having them read the remainder of the sentence before applying phonic and/or structural analysis skills. Finally, they should read the word into the sentence to see if it fits the semantics. This latter step should bring about an improvement in reading for meaning.

3. The use of syntax, semantics, and the initial visual and sound clue seemed to be a natural method developed by the subjects as a word attack strategy and should not only be encouraged, but the students

should be taught to use it more effectively. Furthermore, less stress should be placed upon some phonic and structural analysis skills which are infrequently used by children in word identification while reading.

4. The use of syntax and semantics by both second and fifth graders strongly suggested that they use their language as a model with which they set expectancies while reading. Therefore, every effort should be made to extend children's language before they read to include new words and concepts that will be met in the reading material. Generally speaking, one of the major goals of instruction should be to enlarge and improve children's speaking and reading vocabularies and language structure.

5. The tendency demonstrated by both groups of subjects to guess at a word or to wait until the word was told to them suggested that more stress should be placed upon functional phonic and structural analysis skills in an actual reading situation thereby overcoming the problem of transfer from drill in isolation to functional usage.

Implications for Further Research

1. The findings from this study strongly suggested that second and fifth grade students tended to utilize the initial consonant combined with syntax and/or semantics as their major means of word attack while reading. A study using the modified cloze procedure to ascertain what percentage of unknown words students could correctly identify using those skills would be helpful in planning instruction in the word recognition skills.

2. These findings suggested that students at the second and fifth grade level tended not to use many of the phonic and structural analysis skills that they have knowledge of. A study to compare known knowledge of phonic and structural analysis skills and what is used in reading may assist in planning which phonic and structural analysis skills should be stressed in reading instructions.

3. A study designed to ascertain if students tend to alter their word attack strategy when going from easy to difficult reading material would also give some guidelines in what word recognition skills or strategies to include in the reading instructional program.

4. A study designed to ascertain the word attack strategies developed by two different groups of children -- one being subjected to a program which places a heavy stress upon phonics, and the other subjected to a program that did not place as much stress upon phonics would tend to provide insight into how functional phonics skills really are and what kind of word attack strategy children develop as a result of such training, and whether it differs from the strategy developed by children who did not receive intensive phonic training.

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TABLE 3

COMPARISON BETWEEN MEAN TEST SCORES OBTAINED IN SAMUELS' (1967) STUDY

WITH MEAN TEST SCORES OBTAINED IN PRESENT REPLICATION STUDY

Treatment	Mean test scores		Accuracy of replication
	Samuels (1967)	Present study	
No-picture	19.2	38.6	+201%
Simple-picture	11.3	36.9	+327%
Complex-picture	11.6	35.9	+309%

TABLE 4

AMOUNT OF VERBAL FEEDBACK GIVEN TO NO-PICTURE, SIMPLE-PICTURE, AND

COMPLEX-PICTURE GROUPS DURING ACQUISITION TRIALS

Treatment	Number of verbal feedbacks	Percent of total feedback
No-picture	142	88
Simple-picture	1	1
Complex-picture	19	11
Total	162	100%

-TABLE 5

FREQUENCY OF BOY-BED CONFUSIONS MADE BY NO-PICTURE, SIMPLE-PICTURE,

AND COMPLEX-PICTURE GROUPS DURING ACQUISITION TRIALS

Treatment	Number of boy-bed confusions	Number of non-confusions
No-picture	24	376
Simple-picture	0	400
Complex-picture	0	400