Reading Horizons: A Journal of Literacy and Language Arts

Volume 15
Issue 4 *July 1975*

Article 3

7-3-1975

Disruptive Effect: A Phenomenon in Oral Reading

John W. Miller
Wichita State University

DISRUPTIVE EFFECT: A PHENOMENON IN ORAL READING

John W. Miller
WICHITA STATE UNIVERSITY

PURPOSE

The major purpose of the present study is to examine the effect that an unknown word has on the oral reading of second grade children. Specifically, the study is concerned with the possible increased probability of error on words that are in close proximity to an unknown word. Additionally, the study examines the degree of disruptiveness created by unknown words in different grammatical positions, and the degree of disruptiveness of various types of unknown words.

SIGNIFICANCE

Observation of oral reading reveals that many children tend to produce errors in clusters. It seems possible that one unknown word may produce an environment in which errors occur on surrounding known words. In effect, one error may produce a triggering of other errors that would not have occurred had the original unknown word not been present. The ramifications of this suggested phenomenon may result in artificially depressed scores on such oral reading measures as informal reading inventories, standardized oral reading tests, and portions of diagnostic reading instruments. In effect measures of oral reading that rely on surviving oral reading errors to produce a "score" may be developing a distorted view of a reader's actual ability.

In addition to significance at the applied level, the present study also may have heuristic significance to researchers examining the processing of written language. Support for the existence of disruptive effect may lead to new directions using degree of disruption as a dependent variable in examining such factors as the relationship of syntactic structures to readability or the relationship of semantic categorization to children's reading ability.

SPECIFIC QUESTIONS

Four questions are examined in the present study. The first two are addressed to the establishment of disruptive effect as an existent or non-existent phenomenon. Questions three and four are concerned

with the ramifications of disruptive effect, and need be examined only if significant findings can be reported with regard to the first two questions. The four questions are stated as follows:

1. Is there a difference in the number of errors on the four words before and after an unknown word and the number of errors on all other words (not surrounding an unknown word) in a story read orally by second grade children?
2. Is there a difference in the number of errors on the four words before and after an unknown word and the number of errors on the same words when the unknown word is not present in a story read orally by second grade children?
3. Is there a difference in the number of errors four words before and after unknown nouns, verbs, or modifiers?
4. Is there a difference in the number of errors four words before and four words after different types of unknown words?

RELATED LITERATURE

Three specific areas in the literature are of importance to the development of this study: 1. Methods of examination in oral reading, 2. Use of nonsense items as "words" in oral language and reading research, 3. Relationships of cloze technique research and the present study.

Traditionally, examination of oral reading skills has centered on the sum of a student's errors as a product for quantitative inspection. The familiar Gray Oral Reading Test (1963), the Gilmore Oral Reading Test (1951), the oral reading sections of such diagnostic instruments as Durrell Analysis of Reading Difficulty (1955), the Gates-McKillop Reading Diagnostic Test (1962), and the traditional informal reading inventories all derive their basic word accuracy scores by summing insertions, substitutions, omissions, etc. Unfortunately, quantitative analysis lends little insight to the ongoing psychological and linguistic processes of the readers.

Robinson (1973) has called for a new era in test construction. One that will measure oral reading as a qualitative function of processes rather than a quantitative sum of errors. *The Reading Miscue Inventory* (Goodman and Burke, 1972) may be the first instrument to emerge from the psycholinguistic research into oral reading behaviors. With a trend developing towards the examination of oral reading as a qualitative process, definitive knowledge about the nature of the process is required. If the questions surrounding oral reading analysis are

to undergo a change in nature from "How many"? to "Why"?, extensive input from reading specialists, linguists, and learning psychologists is mandatory.

Researchers in the areas of language development and language pathology have frequently made use of nonsense items to isolate specific linguistic variables for analysis. Arnold, Bower, and Bobrow (1972) used nonsense disyllables in semantically compatible and incompatible sentence frameworks to support the hypotheses that comprehensibility affects association formation. Marwit, Marwit, and Boswell (1971) examined the ability of black and white children to derive present, plural, possessive, and time extension forms of nonsense syllables. Krossner (1971) used CVC pattern nonsense syllables in analysis of associative value in class membership statements. The use of nonsense items in examining syntax is listed as one of the six most used methods by Slobin (1967).

Researchers in reading have generally utilized nonsense items in a different manner. Combining letters to form familiar spelling patterns without meaning has been done to examine word attack skills (Gates-McKillop Reading Diagnostic Test, 1962). While this utilization of nonsense items is justified, there are numerous untouched applications for the use of nonsense words to examine oral reading abilities in reading meaningful context.

The use of Cloze procedure indicates that there are linguistic constraints operating both within and between sentences in oral and written language that enable a reader to supply a missing word by use of surrounding contextual clues (MacGinitie, 1961, Ramanskus, 1972). However, there is no definitive information indicating what effect a missing word or an unknown word in written language will have on the known words in the surrounding context.

Obviously, if an unknown word has a detrimental effect on the recognition of surrounding known words, re-examination of traditional quantitative oral reading analysis is necessary.

PROCEDURES

Sample

Forty second grade children were drawn from two classrooms in two lower-middle class, semi-rural schools. The total population of these two classrooms was forty-six; however, six students who were essentially nonreaders were dropped from the sample. The remaining forty children were randomly assigned to the standardization group

(SG) or the experimental group (EG). The EG and SG were both comprised of twenty students.

Materials

Two versions of the story "Plant Doctor" (Early et. al., 1970) were reproduced with permission from Harcourt, Brace and World. "Plant Doctor" was selected as stimulus materials because of its middle second grade difficulty level as ascertained by the Fry Readability Graph (1968) and the Spache readability formula (1953), and because of the appeal it appeared to hold for rural and semi-rural children. Version one, the unmodified version (UV), was retyped with a primary typewriter exactly as it appeared in the basal reader. Version two, the modified version (MV), contained largely the same text, but with approximately five percent of the words changed. (On the average, about one word in twenty was altered.) These modifications became the unknown "words." Beginning with the fourth sentence, and in every other sentence from that point on, selected words in the UV were replaced with specifically designed unknown "words." This version of the story became the MV.

Each version had the same number of words. Every word was assigned a numerical position, except the modified words in the modified version of the story and those words in the unmodified version that were later replaced in the modified version. The word modifications were made on two bases: 1. type of modification, and 2. grammatical position of the modification. The replaced words were modified by type in four ways. The passage contained six of each of the following types of modified words:

1. Real words of a difficulty level considered more than second grade (e.g., companions)
2. Nonsense words that are phonologically possible in English but which do not occur, and are without meaning marker (e.g., proy)
3. Nonsense roots that are phonologically possible in English but which do not occur and have a meaning marker (e.g., spacks)
4. Nonsense words which are not phonologically possible in English (e.g., ndalq).

These modified words were then assigned to one of three grammatical positions in the MV: nouns, verbs, or modifiers. There were eight words holding each of these positions in the MV.

Administration and Scoring

The story was individually administered to every subject (S) in a

quiet testing area. The story was read orally and was tape recorded for later verification of scoring procedures. A total of three judges scored each protocol. Discrepancies were resolved by consensus.

The SG read only the UV of the story. The data for this group were used to establish a criterion for oral reading performance on the story. Therefore, the SG was tested on only one occasion.

The EG was divided into two groups of 10. EG_1 read the original version of the text and then after a one week delay, read the modified version. EG_2 read the two texts in inverted order. This procedure was done to counterbalance the effect of learning.

Errors in oral reading were classified into the following four categories:

1. Omissions: Only whole word omissions were scored and assigned positions.
2. Additions: Whole word additions were scored and assigned the numerical position of the immediately preceding word.
3. Substitutions: Any pronunciation error was scored as a whole word substitution and assigned the numerical position of the actual word in the text.
4. Repetitions: Repetitions were considered an error regardless of the number of words repeated. Repetitions involving spontaneous self corrections were not considered errors. A repetition was assigned the numerical position of the first word repeated.

Errors such as hesitations or punctuation were not considered in this study.

Errors from each protocol were entered onto data cards by numerical position for analysis purposes. A composite tally of errors by word position for each group (SG, EG_1 and EG_2) was calculated. The composite print-outs for each group served as the data for analysis.

Research Hypotheses

The first hypothesis tested was: Is there a significant difference ($a = .01$) between the number of errors surrounding a specific unknown word and the number of errors in those positions throughout the story which are not surrounding unknown words? For this purpose the EG's reading of the modified version of the story was compared to the SG's reading of the unmodified version. A two by two Chi square analysis was used to test the hypothesis.

The second hypothesis was: Within the EG is there a significant difference ($a = .01$) between the number of errors made in the posi-

tions surrounding the unknown words in the modified version of the story and the equivalent positions in the unmodified version of the story? A two by eight Chi square analysis was used.

The third hypothesis was: Is there a significant difference (a = .01) in the number of errors surrounding unknown nouns, verbs, or modifiers in the reading of the modified version by the EG? A one way analysis of variance was used with grammatical position as the independent variable and number of surrounding errors as the dependent variable.

The fourth hypothesis was: Is there a significant difference (a = .01) in the number of errors surrounding difficult words, phonologically possible nonsense words, phonologically possible nonsense roots with meaningful markers, and phonologically impossible words? A one way analysis of variance was used to test the hypothesis with type of modification as the independent variable and number of surrounding errors as the dependent variables.

FINDINGS

Hypothesis one, the crucial hypothesis of the study because of the dependency of the remaining hypotheses, concerns the locations of errors throughout the passage. As can be seen in Table 1 the errors made by the EG on surrounding positions accounted for over 50% (260/501) of the total errors, while for the SG the errors in the surrounding positions accounted for less than 33% (267/806) of the total errors. The

TABLE 1

DISTRIBUTION OF ERRORS BETWEEN SURROUNDING AND NON-SURROUNDING POSITIONS

OBTAINED

	Surrounding	Not Surrounding	
errors	260	241	501
non-errors	3580	7059	10639
	3840	7300	N = 11140

Data from EG's reading of modified version

EXPECTED

	Surrounding	Not Surrounding	
errors	267	539	806
non-errors	3573	6761	10334
	3840	7300	N = 11140

Data from SG's reading

$\chi^2 = 178.08892$

sig. $>$ .01

difference was significant at the .01 level. A significantly greater proportion of errors were made by the experimental group than the SG in the positions surrounding unknown words.

Hypothesis two is connected with the reading by the experimental group of both versions of the story. As can be seen in Table 2 more errors were made on the modified text than the unmodified text. The difference was significant at the .01 level. Not only was the total number of errors greater, but the errors for each surrounding position

TABLE 2

ERRORS SURROUNDING MODIFIED WORDS AND UNMODIFIED WORDS

OBTAINED

Surrounding Word Positions

	-4	-3	-2	-1	+1	+2	+3	+4	
errors	31	20	27	57	45	12	23	45	
non-errors	449	460	453	423	435	468	457	435	
									N = 3840

Data from EG's reading of modified text

EXPECTED

Surrounding Word Positions

	-4	-3	-2	-1	+1	+2	+3	+4	
errors	17	18	20	21	24	9	22	43	
non-errors	463	462	460	459	456	478	458	437	
									N = 3840

Data from EG's reading of unmodified text

$\chi^2 = 98.55368$

sig. $>$ .01

were greater for the modified text. The greatest number of errors were in the + 1 positions.

In relation to hypothesis three significant differences in the number of errors surrounding unknown nouns, verbs, and modifiers were *not*

TABLE 3

RELATIONSHIP OF GRAMMATICAL POSITION AND DISRUPTIVE EFFECT

Source	SS	df	MS	F
Between	18.0334	2	9.0167	
Within	823.2500	21	39.20238	F = .23
Total	841.2834	23		

*F .95 (2.21) = 3.47

**F .99 (2.21) = 5.78

observed. The observed F value (.23) indicated that there were essentially no differences in the effects of various levels of grammatical positions on the number of surrounding errors.

TABLE 4

RELATIONSHIP OF TYPE OF MODIFICATION AND DISRUPTIVE EFFECT

Source	SS	df	MS	F
Between	42.8429	3	14.2809	
Within	609.8750	28	21.78125	F = .65560
Total	652.7179	31		

*F .95 (3.28) = 2.95

**F .99 (3.28) = 4.57

In relation to hypothesis four, no significant differences in the number of errors surrounding unknown words of the various types were observed. The observed F Value (.6556) indicated that there was very little difference in the effects of various levels or type of modification on the number of surrounding errors.

CONCLUSIONS

The data from this study support the notion that a higher incidence of oral reading errors is associated with close proximity to unknown words. This would suggest the need for qualitative analysis of oral reading errors, particularly if they are made in clusters. The child who errs on "easy" words such as *and, said,* etc. may not have produced this error because he did not know the word, but because of

its close proximity to an unknown word. He may have had his attention diverted from the "easy" word to the more difficult one. Unknown words can be disruptive in terms of oral reading. Those assessing oral reading behavior should be aware of this phenomenon.

This conclusion is further strengthened by the rejection of hypothesis two. The same children, reading the same words on two different occasions, erred more frequently when the words were in close proximity to unknown words in the modified version; they made fewer errors on the identical words when the unknown word was not present.

The disruptive effect in oral reading is most apparent in the word immediately preceding and the word immediately following the +1 position surrounding an unknown word than on the same word position without the presence of the unknown word. While the disruptive effect was observed in all eight surrounding positions, it was most evident in the immediately adjacent positions.

While hypotheses three and four of this study were accepted, the data indicated trends that might be borne out in further study with samples across grade levels. It was hypothesized that unknown words in verb positions would be more disruptive than unknown words in modifier positions and that they, in turn, would be more disruptive than unknown words in noun positions. Though not statistically significant, the rankings obtained were as hypothesized. Similarly, it was hypothesized that phonologically impossible modified words would create the most disruptive effect and that nonsense roots with meaningful markers would be least disruptive. Once again the rankings were as hypothesized, although not statistically significant.

The technique used in the study to assess disruptive effect in oral reading appears to be promising. The rejection of hypotheses one and two suggests a degree of validity in the research technique. The trends observed in hypotheses three and four suggest potential for further investigation.

REFERENCES

Arnold, P., Bower, G., & Bebrow, S. Mediated semantic compatibility in associative learning. *Journal of Verbal Learning and Verbal Behavior,* 1972, 11, 293-42.

Durrell, D. *Durrell analysis of reading difficulty.* New York: Harcourt, Brace, & World, 1955.

Early, M., Cooper, E., Santeusanio, A., & Adell, M. (Eds.) *The Bookmark Reading Program.* New York: Harcourt, Brace, & Jovanovich, 1970.

Fry, E. A readability formula that saves time. *Journal of Reading,* 1968, 11, 513-16.

Gates, A., & McKillop, A. *Gates-McKillop reading diagnostic tests.* New York: Teachers College Press, 1962.

Gilmore, J. *Gilmore oral reading test.* New York: Harcourt, Brace, & World, 1951.

Goodman, Y., & Burke, C. *The reading miscue inventory.* London: The Macmillan Co., 1972.

Gray, W. *Gray oral reading test.* Indianapolis: Bobbs-Merrill, 1963.

Krossner, W. Further evidence for linguistic operations in the analysis of class membership statements. *Psychonomic Science,* 1971, 22, 127-8.

MacGinitie, W. Contextual constraint in English prose paragraphs. *Journal of Psychology,* 1961, 51, 121-130.

Marwit, S. J., Marwit, K. L., & Boswell, J. S. Negro children's use of nonstandard grammar. United States Office of Education BR-O-F-049. 1971.

Ramanaskus, S. The responsiveness of cloze readability measures to linguistic variables operating over segments of text longer than a sentence. *Reading Research Quarterly,* 1972, 8, 72-90.

Robinson, H. A. Testing reading: Product versus process, *The Reading Teacher,* 1972, 26, 303-4.

Slobin, D. (Ed.) A field manual for cross-cultural study of the acquisition of communicative competence, (Second draft, July, 1967).

Spache, G. A new readability formula for primary grade reading materials. *Elementary School Journal,* 1953, 53, 410-13.