

COMPREHENSION AND LANGUAGE CUES

O. PAUL WIELAN

St. John's University

According to the principle proponents of the psycholinguistic philosophy (K. Goodman, 1970; Y. Goodman, 1975; Burke, 1975; Mavrogenes, 1975; Allen, 1976), reading requires not so much skills as strategies that make it possible to select the most productive cues present in language. Reading strategies are the myriad ways readers process information when dealing with written language; they are the methods employed to reconstruct a message as readers perceive the author produced it. The most basic and important strategy (Smith, 1971; Cooper and Petrosky, 1976) is the utilization of redundancies — orthographic, syntactic, and semantic — to reduce uncertainty about meaning. Communication theorists use the word "redundancy in a special sense to describe a tendency of language to restrict the sequences in which language symbols can occur, to furnish several cues to the same bit of information, and, thus, to be less than 100 percent efficient in the amount of information transmitted per unit of language (Smith, Goodman, and Meredith, 1976). This inefficiency or redundancy has two germane effects on reading: firstly, it provides repetitious cues within words and in the flow of language, and, secondly, it provides a narrowing of elements in language that can occupy certain slots. The process by which the reader immediately or eventually recognizes a word is a kind of tentative "zeroing in" (Smith, Goodman, and Meredith, 1976). Successive sets of redundant cues narrow the number of possible words in the language that can fit. As he responds to these redundant cues, the reader is guessing, but he is an enlightened guesser. He is using his knowledge of language, his past experience, and his developed concepts. If he makes a mistake, there are almost always abundant additional cues to tell him that he is wrong and to tell him what is right.

The more redundancy there is, the less visual information the skilled reader demands (K. Goodman, 1966, 1967). In passages of continuous text, assuming that the language is familiar and the content is not too difficult, every other letter can be eliminated from most words, or about one word in five omitted altogether without making the passage incomprehensible (Smith, 1978). Since its development, the cloze procedure (Taylor, 1953) has been used as a major tool in the investigations of a number of the above-mentioned theoretical positions. Cloze is based on the assumption that the interaction of all semantic, grammatical, and stylistic characteristics of a message will affect the degree of redundancy, that is, the predictability of a message. A highly redundant article should be easy to read because it contains many frequently used words arranged in commonly used language patterns so that the reader is, in large degree, aware of what is coming next at any point in the text. A cloze test may, therefore, be considered a sample of message redundancy because it samples the reader's ability to predict what comes next at chosen points in the article (Rankin, 1959). From the point of view of linguistics, cloze tests are particularly attractive as a means of testing the comprehension of text since they call on the per-

son taking the test to employ the constraints of language in order to perform the testing task (Griffin, 1978). A reader who succeeds in completing correctly a relatively large number of missing words might be regarded as one who is able to make greater use of redundancy in the passage and who consequently, comprehends it more (Smith, 1978).

Psycholinguistics appears to offer a viable conceptual foundation on which to base the exploration of some of the underlying processes involved in reading — the exploration of reading as an active, learning process rather than a final product. Since even a cursory examination of a cloze exercise would reveal that producing correct responses involves sensitivity to both distributional and sequential redundancy, the use of such a technique would seem to be a promising approach for investigating language and reading competency. This study was an attempt to examine whether, in fact, comprehenders at the secondary school levels possess the ability to utilize the constraints of syntactic and semantic redundancy as reading strategies. One way in which this analysis may be useful is to provide the theoretician with evidence as to what a model of comprehension might encompass. If certain aspects of the process appear more difficult than others, researchers may gain insight into the hierarchical nature of the components of the skill. In addition, contrasting comprehenders at various stages of the acquisition process should provide pedagogical implications. To design reading comprehension instruction for the reader requiring remediation, it may be pragmatic to determine at what points in the process good, average, and poor comprehenders do and do not diverge.

Purpose and Procedures

The present study was an investigation of how language cues used during silent reading are affected by level of comprehension and grade level placement. Specifically, the purpose of the study was to examine the abilities of good, average, and poor comprehenders at the eighth, tenth, and twelfth-grade levels to utilize syntactic and semantic redundancy as reading strategies. Additionally, the relationship of syntactic to semantic scores for good, average, and poor comprehenders, and the relationship of syntactic to semantic scores for eighth, tenth, and twelfth-grade students were explored. The particular questions addressed were as follows:

1. How do good, average, and poor comprehenders at the eighth, tenth, and twelfth-grade levels differ in their abilities to employ syntactic redundancy strategies during silent reading?
2. How do good, average, and poor comprehenders at the eighth, tenth, and twelfth-grade levels differ in their abilities to employ semantic redundancy strategies during silent reading?
3. Are syntactic and semantic redundancy abilities differentially related in regard to level of comprehension?
4. Are syntactic and semantic redundancy abilities differentially related in regard to grade level placement?

The subjects for this study were 180 eighth, tenth, and twelfth-grade students selected from Jefferson High School, Jefferson, Georgia. At each grade level, 60 students were assigned to one of three comprehension level groups. The basis

for determining the reading levels of these students was a standardized reading test at the secondary level, *The Nelson-Denny Reading Test*, Form C (J. Brown, 1976). Percentile ranks and grade equivalents were employed to stratify subjects into good, average, and poor comprehension level groups.

The instruments used for data analysis were six modified cloze tests, a set of two designed for each grade level. Initially, two selections of approximately 300 words in length and a readability level in the 7.0 to 8.0 grade equivalent range were chosen for the tenth-grade sample. These passages were rewritten downwards to a readability level in the 5.0 to 6.0 grade equivalent range for the eighth-grade sample and upwards to a readability level in the 9.0 to 10.0 grade equivalent range for the twelfth-grade sample. Rewriting was executed by manipulating syllabication, word length, and sophistication of vocabulary. Syntax was held constant. Final readability was substantiated by both the Fry Readability Graph and the Raygor Readability Estimate. Three passages were then examined to identify the syntactic/structural elements and three passages were examined to identify the semantic/lexical elements. The criteria utilized for differentiating the grammatical elements were Fries' (1952) function and content word classifications. According to Rankin (1959), structural meaning is signaled by individual function words which include such words as verb auxiliaries, articles, prepositions, conjunctions, and possessive and relative pronouns. Lexical meaning, conversely, is conveyed by nouns, verbs, adjectives, and adverbs. To construct the cloze tests, an every fifth word deletion pattern was employed on the targeted structural elements and on the designated lexical elements. The 180 subjects were requested to complete two modified cloze tests, a syntactic and a semantic, randomly distributed from the appropriate grade level cloze passages. In the scoring of responses, only exact word replacement was accepted as correct.

Two two-way factorial analysis of variance designs were used to test the hypotheses related to questions one and two. Eta coefficients were calculated to establish the magnitude of effect size of significant *F*-values. Bonferroni *t*-statistics were performed to compare group means when analyses resulted in significant *F*-values. The hypotheses written from questions three and four were tested utilizing two tests for the significance of differences between independent correlations. The .05 level of confidence was used to determine statistical significance.

DISCUSSION

The results of the present study indicate that grade level placement had a fairly moderate and statistically significant effect on secondary students' abilities to utilize syntactic and semantic redundancy. Approximately 12 percent of the variance in performance on both syntactic and semantic cloze tests can be accounted for by knowing a subject's grade level placement. Specifically, a comparison of group means revealed that two stable mean differences existed. Students in the twelfth-grade group achieved appreciably higher scores on the two measures than did their eighth and tenth-grade counterparts. These findings appear to add little in explaining the contradictions emerging from previous research. The data from some well-designed experiments suggested that there was no relation between level of grade placement and sensitivity to

language structure and passage meaning. For example, Siler (1973-74), Rode (1974), and Ryan and Willows (1979) found that older, more skilled readers made no greater use of these sources of information than did younger, less skilled readers. In contrast, Pearson and Studt (1975), Streib (1976-77), and Deck (1977) have reported results that appear to be in direct conflict with those just presented. These latter researchers have compared groups across grade levels, and have concluded that children utilize syntactic and semantic information more and more effectively than one grade to the next. Methodological variations may contribute to these diverse findings since research with the cloze procedure has not been consistent in deletion patterns, type of text, age of subjects, and tests used as the criteria.

The results of the present investigation also indicate that comprehension level had a moderate and statistically significant impact on secondary students' abilities to employ syntactic and semantic redundancy strategies. Approximately 23 percent of the variance in performance on a syntactic cloze test and 40 percent of the variance in performance on a semantic cloze test can be explained by knowing to which reading level a subject was assigned. Good comprehenders scored considerably higher on both tasks than did average and poor comprehenders. These findings support all similar studies in the related literature. Cromer and Wiener (1966), Rousch (1972), Watson and Clay (1975), Clearly (1976) Neville and Pugh (1976-77), and Ryan and Willows (1979) have shown that regardless of grade levels used good readers demonstrated the ability to use grammatical and contextual constraints more proficiently than poor readers. The difficulty of the test materials may have been confounded with level of reading ability, such that any differences in performance between good and poor readers might be attributable to the relatively greater difficulty of the task for the poor readers. Because of the amount of variance explainable by grade level placement and level of comprehension, it appears that the completion of a cloze test requires a complex set of factors. As Rankin (1974) and Streib (1976-77) have stated, such factors as background information, general language ability, and attention span should be considered. Another reason may be that the intellectual challenge of engaging in the "psycholinguistic guessing game" of predicting, sampling, selecting, confirming, or rejecting is insufficiently appealing to motivate some children to exert the necessary effort.

In the present study it was also found that syntactic and semantic cloze scores were not more positively related between grade level placement groups or between comprehension level groups. Comparisons of correlation coefficients between eighth and tenth-grade subjects, tenth and twelfth-grade subjects, and eighth-and-twelfth-grade subjects demonstrated no significant differences. Likewise, there were no statistically significant differences between the correlation coefficients of good and average comprehenders, average and poor comprehenders, and good and poor comprehenders. All initial correlations were stable and fell within the moderate range (.312 to .589). These findings are somewhat lower than those reported by Vaughan, Tierney, and Alpert (1977) whose results (.49 to .70) indicated moderately high positive correlations across grade levels. However, this previous study analyzed the data in terms of syntactically acceptable and semantically ac-

ceptable cloze scores, and not in terms of exact word replacement. In accord with the latter research, results of the present study suggest that syntactic and semantic elements of language are neither independent of one another nor totally dependent. Instead, these elements are related aspects of language and should both be considered when attempting to explicate language and its relationship to students' reading achievement. In view of assessing observed responses in reading comprehension via cloze tests, a meaningful relationship exists between syntactic and semantic elements.

Finally, the results of this study show variable functioning of language deletion systems with a secondary school sample. Semantic cloze tests with deleted content/lexical words were more difficult to complete than syntactic cloze tests with a function/structural word deletion pattern. These findings are in agreement with those of Taylor (1957), Rankin (1957), Louthan (1965), Weaver (1965), Weaver and Bickley (1967), and Hittleman (1971), who utilized similar deletion systems. For the total sample in the present research, successful syntactic cloze responses were 2.2 times greater than successful semantic cloze responses. These ratios for good, average, and poor comprehenders were 1.9, 2.3, and 2.9, respectively. Across grade level placements, the ratios for eighth, tenth, and twelfth-grade students were 2.4, 2.3, and 2.1, respectively. It would appear that good readers at the eighth-grade level as well as poor readers at the twelfth-grade level have problems identifying nouns, verbs, adjectives, and adverbs from context. One explanation for this phenomena may be that syntactic redundancy is rooted in linguistic predictability, whereas repetition tends to figure more importantly in semantic redundancy. Consequently, the conceptual information needed to reduce uncertainty about content test items would be more widely scattered throughout a passage and less easily retrievable from a "language storebank." That readers at the secondary level where, supposedly, experiential background is at a more advanced level and decoding skills have been mastered can infer context accurately through reading appears open to conjecture. Instead, it seems that readers at all levels require direct instruction in the employment of redundancy and context clues as efficient and fruitful strategies. The use of cloze materials for training purposes in the reading classroom would appear to be a promising approach for developing these sensitivities.

REFERENCES

- Allen, P.D. Implications for reading instruction. In P.D. Allen and D.J. Watson (Eds.), *Findings of research in miscue analysis: Classroom implications*. Urbana, Illinois: National Council of Teachers of English, 1976, 107-112.
- Brown, J. *The Nelson-Denny Reading Test*. Boston: Houghton Mifflin Company, 1976.
- Burke, C. Oral reading analysis: A view of the reading process. In W.D. Page (Ed.), *Help for the reading teacher: New directions in research*. Urbana, Illinois: National Council of Teachers of English, 1975, 32-33.
- Clearly, D. Reading without vowels: Some implications. *Journal of Reading*, 1976, 20, 52-56.

- Cooper, C.R., and Petrosky, A.R. A psycholinguistic view of the fluent reading process. *Journal of Reading*, 1976, 20, 184-207.
- Cromer, W., and Wiener, M. Idiosyncratic response patterns among good and poor readers. *Journal of Consulting Psychology*, 1966, 30, 1-10.
- Deck, D. Validity of word deletion items as a measure of reading comprehension. Paper presented at the annual meeting of the American Educational Research Association (61st, New York, New York, April 1977), ED 138624.
- Fries, C.C. *The structure of English*. New York: Harcourt, Brace, 1952.
- Goodman, K.S. A psycholinguistic view of reading comprehension. In G.B. Schick and M.M. May (Eds.), *Fifteenth yearbook of the national reading conference*. Milwaukee, Wisconsin: The National Reading Conference, Inc., 1966, 188-196.
- Goodman, K.S. Reading: A psycholinguistic guessing game. *Journal of the Reading Specialist*, 1967, 6, 126-135.
- Goodman, K.S. Psycholinguistic universals in the reading process. *Journal of Typographic Research*, 1970, 4, 103-110.
- Goodman, Y.M. Reading strategy lessons: Expanding reading effectiveness. In W.D. Page (Ed.), *Help for the reading teacher: New directions in research*. Urbana, Illinois: National Council of Teachers of English, 1975, 34-41.
- Griffin, P. *Assessing comprehension in a school setting*. Arlington, Virginia: Center for Applied Linguistics, 1978.
- Hittleman, D.R. The readability of subject matter material rewritten on the basis of students' oral reading miscues. Unpublished doctoral dissertation, Hofstra University, 1971.
- Louthan, V. Some systematic grammatical deletions and their effects on reading comprehension. *English Journal*, 1965, 54, 295-299.
- Mavrogenes, N.A. Using psycholinguistic knowledge to improve secondary reading. *Journal of Reading*, 1975, 18, 280-286.
- Neville, M.H., and Pugh, A.K. Context in reading and listening: Variations in approach to cloze tasks. *Reading Research Quarterly*, 1976-77, 12, 13-31.
- Pearson, P.D., and Studt, A. Effects of word frequency and contextual richness on children's word identification abilities. *Journal of Educational Psychology*, 1975, 67, 89-95.
- Rankin, E.F. An evaluation of the cloze procedure as a technique for measuring reading comprehension. Unpublished doctoral dissertation, University of Michigan, 1957.
- Rankin, E.F. The cloze procedure—its validity and utility. In O.S. Causey and W. Eller (Eds.), *Eighth yearbook of the national reading conference*. Fort Worth, Texas: The Texas Christian University Press, 1959, 131-144.
- Rankin, E.F. The cloze procedure revisited. In P.L. Nacker (Ed.), *Twenty-third yearbook of the national reading conference*. Clemson, South Carolina: The National Reading Conference, Inc., 1974, 1-8.
- Rode, S.S. Development of phrase and clause boundary reading in children. *Reading Research Quarterly*, 1974, 10, 124-142.
- Rousch, P.D. A psycholinguistic investigation into the relationship between prior conceptual knowledge, oral reading, miscues, silent reading, and post-reading performance. Unpublished doctoral dissertation, Wayne State University, 1972.
- Ryan, E.B., and Willows, D.M. Differential utilization of syntactic and semantic information by skilled and less skilled readers in the intermediate grades. Paper presented at the annual meeting of the American Educational Research Association (63rd, San Francisco, California, April 1979).
- Siler, E.R. The effects of syntactic and semantic constraints on the oral reading performance of second and fourth graders. *Reading Research Quarterly*, 1973-74, 9, 583-602.
- Smith, E., Goodman, K., and Meredith, R. *Language and thinking in school*. New York: Holt, Rinehart and Winston, 1976.
- Smith, F. *Understanding reading*. New York: Holt, Rinehart and Winston, 1971.
- Smith, F. *Understanding reading* (2nd ed.). New York: Holt, Rinehart and Winston, 1978.
- Streib, R. Context utilization in reading by educable mentally retarded children. *Reading Research Quarterly*, 1976-77, 12, 32-54.
- Taylor, W.L. Cloze procedure: A new tool for measuring readability. *Journalism Quarterly*, 1953, 30, 415-433.
- Taylor, W.L. Cloze readability scores as indices of individual differences in comprehension and aptitude. *Journal of Applied Psychology*, 1957, 41, 19-26.
- Vaughan, J., Tierney, R., and Alpert, M. A psycholinguistic analysis of cloze responses. In P.D. Pearson and J. Hansen (Eds.), *Twenty-sixth yearbook of the national reading conference*. Clemson, South Carolina: The National Reading Conference, Inc., 1977, 200-202.
- Watson, S., and Clay, M. Oral reading strategies of third-form students. *New Zealand Journal of Educational Studies*, 1975, 10, 43-51.
- Weaver, W.W. Theoretical aspects of the cloze procedure. In E.L. Thurston and L.E. Hafner (Eds.), *Fourteenth yearbook of the national reading conference*. Milwaukee, Wisconsin: The National Reading Conference, Inc., 1965, 115-132.
- Weaver, W.W., and Bickley, A.C. Sources of information for responses to reading test items. Proceedings of the APA 75th annual convention, 1967, 293-294.