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ABSTRACT

A study investigated whether syntactic differences between oral and written discourse interfere with the comprehension of beginning readers. Subjects were 28 second grade and 28 fifth grade students who read, orally, versions of stories identical in nature except for the structure of their syntactic patterns. One version contained structures more frequently found in written discourse (subordinate and relative clauses, appositive and participial phrases, and passive verbs), while the other used syntactic patterns more typical of oral discourse (coordinated clauses and active verbs). Reading comprehension was assessed with a standardized retelling task, and a measure of student familiarity with the syntactic patterns of written discourse was obtained with an oral storytelling task. Data analysis indicated that versions of stories with written discourse structures were marginally more difficult for students to comprehend than versions with oral structures, with the interference effect caused by written discourse structures being greater among second grade than among fifth grade students. Additional findings indicated that (1) the interference effect was significantly related to familiarity with these structures at the second but not the fifth grade level, and (2) students' word recognition errors reflected high expectations for syntactic patterns more typically found in oral discourse, especially among second grade students. (Two versions of a story used in the study are appended.) (FL)

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The Effects of Syntactic Differences Between Oral
and Written Discourse on the Reading Comprehension
of 2nd and 5th Grade Students

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While individuals investigating reading comprehension differ on the details of their theoretical constructs, there are three characteristics that most models of the reading process share. First, there is increasing agreement that the prediction of upcoming text is central to proficient reading comprehension (Goodman & Goodman, 1977; Neisser, 1967; Smith, 1971; Stevens & Rumelhart, 1975; Wildman & Kling, 1978-79). Second, this prediction is accomplished by bringing to bear one's knowledge of how language is typically organized on the graphic and contextual information available in the text (Goodman, 1976; Morton, 1970; Rumelhart, 1976; Smith, 1971). Finally, comprehension models generally depict the reading process of the mature reader (Goodman, 1976; Gough & Cosky, 1977; Morton, 1970; Rumelhart, 1976; Samuels & Eisenberg, 1981).

There is a large amount of consistent evidence supporting the first two aspects of reading comprehension models. Anticipation, based on one's familiarity with linguistic organization appears to be an important characteristic of the reading process (Clay, 1968; K. Goodman & Burke, 1973; Klein, Klein & Bertino, 1974; Pearson & Studt, 1975; Tulving & Gold, 1963; Whaley, 1981). Defining reading comprehension from the perspective of a mature reader, however, has created an important problem: it has biased our perception of the anticipatory process utilized by beginning readers. This has resulted in an incomplete understanding of the task faced by a child who is learning to read; a fact which has important consequences for both theory and practice.

The problem arises from the assumption of most models that a reader's previous oral language experiences provide a familiarity with linguistic organization sufficient for the efficient anticipation of written language (Rubin, 1978). Goodman (1973, p.9) reflects a fairly typical view when he

suggests that efficient reading takes place when the reader, "...makes predictions of the grammatical structure he learned when he learned oral language."

This assumption may not be justified. There is increasing evidence to suggest that the syntactic organization of oral discourse differs in important aspects from the syntactic organization of written discourse. Written discourse has been characterized as more "complex" (Syder & Pawley, 1976), "integrated" (Chafe, in press), or "explicit" (Hildyard & Olson, 1978). Investigators typically attribute high levels of complexity, integration, or explicitness in written discourse to the greater frequencies of subordinate clauses, relative clauses, participial phrases, appositive phrases, and passive verb constructions that exist in this mode (Chafe, in press; Hildyard & Olson, 1978; Kroll, 1977; Loban, 1976; O'Donnell, Griffin & Norris, 1967; Syder & Pawley, 1976). Oral discourse, on the other hand, has been characterized as more coordinated (Chafe, in press; Syder & Pawley, 1976), more "involved" (Chafe, in press), or "implicit" (Hildyard & Olson, 1978; Kay, 1977). Investigators usually attribute high levels of coordination, involvement or implicitness to the greater frequencies of coordinated conjunctions and active verb constructions that exist in this mode (Chafe, in press; Kroll, 1977; Loban, 1976; O'Donnell, Griffin & Norris, 1967; Syder & Pawley, 1976).

Consider, as an example, the data in Figure 1. Here a written sample from a third grade reader (Scott, Foresman, 1976) and a child's oral retelling of the same story portion are compared. The syntactic features more frequently found in written discourse have been underlined. Immediately apparent is the fragmented quality of the oral discourse where coordinated conjunctions typically link together relatively independent ideas. In contrast, the written selection explicitly states the relationships between ideas with the use of subordinate clause markers (until, when) and relative clause markers (where,

that, what). In addition, the written selection contains one passive verb construction while this child's oral protocol contains none. Clearly, the written language that this third grade student encounters in the classroom is more syntactically integrated than the oral language he produces.

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INSERT FIGURE 1 ABOUT HERE

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The clear differences between oral and written discourse at the level of sentence syntax raises the possibility that familiarity with the syntactic organization of written discourse may be an important step in the acquisition of beginning reading skills. Beginning readers whose familiarity with linguistic organization was acquired through oral language experiences may, at least initially, formulate hypotheses based on an inappropriate set of syntactic probabilities. The conflict between oral discourse expectations and written discourse structures may thus interfere with the comprehension of beginning readers.

In contrast to a relatively extensive literature establishing differences between the structural organization of speech and writing, no previous work has attempted to directly relate the importance of these differences to reading acquisition. There is, however, indirect evidence that the differences may be critically important in three, specific ways.

There is evidence, first, that a relationship exists between the frequency of the oral language structures produced by children and their reading comprehension of materials containing these structures (Ruddell, 1965; Tatham, 1970). The reading comprehension of young children is facilitated when materials contain high-frequency syntactic patterns from their oral language. When materials contain low-frequency syntactic patterns from their oral language, the reading

Figure 1. An Example of the Oral Language From a Third Grade Student and the Written Language Found in a Third Grade Reader

ORAL LANGUAGE

... And then .. night of the race,
.. un ... he wanted the antlers
.. but .. but ... and so he made a little path,
... but the owl,
.. but he didn't know the owl saw,
.. and ... he um ... told the other animals,
and he woke them up .. and told em,
... that ... what he did.

WRITTEN LANGUAGE

On the night before the race,
he sneaked to the place where the race would be run.
He chewed through the tall grass and bushes
until he had cleared a path.
But the rabbit didn't know that the owl was
watching him.
When the rabbit left, the owl flew
back to wake the other animals.
He told them what the rabbit had done.

comprehension of young children is impeded. Since structures more typical of written language appear relatively infrequently in the oral language of children who are still receiving reading instruction (Harrell, 1957, Loban, 1976, Leu, 1980; O'Donnell, Griffin & Norris, 1967) it is possible that these structures may also tend to impede their reading comprehension. In particular, it is expected that if two versions of the same story are constructed, one containing mainly written language patterns and the other containing mainly oral language patterns, the former will be more difficult for young children to comprehend. This possibility will be referred to as the written language hypothesis.

There is some evidence that low frequency oral language structures may be especially difficult for beginning readers to comprehend during reading. Tatham (1970) found that low frequency oral patterns interfered more with the reading comprehension of beginning readers (2nd graders) than the reading comprehension of more proficient readers (4th graders). It is, therefore, quite possible that structures typical of written language (which occur infrequently in the oral language of young children) may have a particularly strong interference effect on the reading comprehension of beginning readers. The difference in reading comprehension between stories without written language structures and similar stories that contain these structures should be greater for less proficient readers than more proficient readers. This will be referred to as the written language x proficiency interaction hypothesis.

Finally, some individuals produce a much higher frequency of written language structures in their oral language than others (Leu, 1980; Loban, 1976). One would also expect, on the basis of work by Ruddell (1965) and Tatham (1970), that the interference effect caused by written language structures should be less for these children than for children who produce a low frequency of written language structures in their oral language. That is, as children

increasingly produce written language structures in their speech the difference in reading comprehension between stories without written language structures and similar stories with written language structures should decrease. This will be referred to as the written language x oral language interaction hypothesis.

PURPOSE

The purpose of this study was to investigate the possibility that familiarity with linguistic organization, developed through oral discourse experiences, is inadequate preparation for the efficient processing of written text. Since the knowledge of linguistic organization that children bring with them to the reading task is largely based on oral language experiences, it is possible that structural differences between oral and written language may create particular difficulties for reading comprehension. Beginning readers may formulate hypotheses based on their knowledge of the syntactic probabilities of one mode (oral language) while they try to comprehend in a second mode (written language) containing very different syntactic probabilities. The conflict between oral discourse expectations and written discourse structures may produce inaccurate and inefficient processing which may, in turn, result in a loss of reading comprehension. Four experimental hypotheses were proposed:

1. Mean reading comprehension scores will be significantly lower when young children read stories with written language structures than when they read similar stories without these structures.
2. The interference effect produced by written language structures will be greater among younger, less proficient readers.
3. The interference effect will be negatively related to familiarity with written language structures among younger, less proficient readers.
4. The interference effect will be negatively related to familiarity with written language structures among older, more proficient readers.

PROCEDURES

The 28 second grade students and 28 fifth grade students who participated in

this study were randomly selected from a single school district. Students were distinguished by three between-subject factors: 1) familiarity with written language structures, 2) grade level, and 3) treatment condition. One within-subject factor (trial) was also included in the design.

Familiarity with written language structures was determined in a story-telling task. Students were asked to tell a story contained in a set of pictures (Mayer, 1975) to a naive peer. Performances were recorded and transcribed. The number of written language structures (subordinate clauses, relative clauses, appositive phrases, participial phrases, and passive verbs) used by each subject was calculated. The number of written language structures per hundred words was used as a measure of familiarity with written language structures. This was referred to as a written feature production score.

The inter-rater reliability of this procedure was assessed by having a second scorer calculate a written feature production score for each student. The Pearson product moment correlation between first and second scoring was significant ($r=0.95$, $df=54$, $p < .05$).

Two versions (with and without written language structures) of two stories ("Helping a Friend" and "Don't Forget") were combined in a 2 x 2 block design (language order x story order) such that 4 treatment conditions were possible at each grade level:

- Condition 1: "Helping a Friend" - with written language structures
 "Don't Forget" - without written language structures
- Condition 2: "Helping a Friend" - without written language structures
 "Don't Forget" - with written language structures
- Condition 3: "Don't Forget" - with written language structures
 "Helping a Friend" - without written language structures

Condition 4: "Don't Forget" - without written language structures
"Helping a Friend" - with written language structures

Within each treatment condition children read both stories and both language versions but did not read the same story twice. Assignment to condition was randomized.

Language versions with written language structures contained four instances each of five syntactic patterns found more frequently in written discourse (subordinate clauses, relative clauses, participial phrases, appositive phrases, passive verb constructions). Language versions without written language structures did not contain these syntactic patterns; instead, a coordinated style more typical of oral discourse was used. An example of two language versions from one story at the second grade level appears in Appendix A. Within each grade level, story versions were distinguished mainly by their syntactic patterns. Propositional content, schematic organization, the number of words, vocabulary level, and readability level were all identical.

Between grade levels, version pairs were distinguished mainly by the vocabulary level outside of written language structures and average sentence length. Propositional content, schematic organization, syntactic patterns, words used within written language structures, and the total number of words were all either identical or nearly identical. Vocabulary and average sentence length had to be altered in order that students at each grade level received materials appropriately difficult for their ability as measured by four different readability formulae (Harris-Jacobson, in Harris & Sipay, 1975; Fry, 1968; Spache, 1953; Dale-Chall, 1948).

The within-subject factor (trial) had two levels. Trial 1 consisted of the first reading task in each student's treatment condition. Trial 2 consisted of the second reading task.

A measure of reading comprehension was used as a dependent variable to test the first two hypotheses. Reading comprehension was determined by a student's score on a standardized retelling task (Y. Goodman & C. Burke, 1972) following the oral reading of each story. There were four components to the total comprehension score: Character Analysis (30 points), Setting and Events (45 points), Plot (15 points), and Theme (10 points). A reading comprehension difference score was used as a dependent variable to test the third and fourth hypotheses. Reading comprehension difference scores were calculated by subtracting a student's retelling score on the passage with written language structures from their retelling score on the passage without written language structures. To assess the inter-rater reliability of the scoring procedure used for retellings, 28 retellings, from 14 randomly selected subjects (7 second graders and 7 fifth graders) were independently rescored. The Pearson product moment correlation between first and second scorers was significant ($r=0.96$, $df=26$, $p < .05$).

Following the retelling task, students were asked a set of 20 specific recall probes. Each probe was designed to assess comprehension of the propositional information at one of the written language structure locations. For example, recall of the participial phrase information in the sentence Jim, walking home, thought, "Today, May 10th, is my birthday." was elicited with the probe What was Jim doing when he thought to himself, "Today, May 10th, is my birthday."? Recall performance at these locations was used in conjunction with a post-hoc, oral reading error analysis relating recall ability to the appearance of oral reading errors at written language structure locations. The reliability of scoring decisions made on responses to recall probes was assessed by independently rescored 28 retellings from 14 randomly selected subjects (7 second graders and 7 fifth graders). The Pearson product moment correlation between first and second score was significant ($r=0.97$, $df=26$, $p < .05$).



RESULTS

Story-Telling Task

The average frequency of written language structures per hundred words for fifth graders ($\bar{X} = 2.89$) was higher than for second graders ($\bar{X} = 1.55$). This difference between grade levels was statistically significant ($t = 4.53$, $df = 54$, $p < .05$). Fifth grade students more frequently used written language structures in their oral language. Moreover, the effect of grade level was particularly strong, accounting for about 27% of the total variation in scores. Average deviations about each group's mean were not significantly different according to an F test of sample variances ($F = 1.88$, $p > .05$).

The length of oral language samples as measured by total number of words was almost identical between grade levels. The difference in the mean number of words used by second graders ($\bar{X} = 295.29$) and fifth graders ($\bar{X} = 293.82$) was not statistically significant ($t = .06$, $df = 54$, $p > .05$).

A student's written feature production score was not related to the length of their oral language sample. The Pearson product-moment correlation, calculated for all students, between the number of written structures per hundred words and the number of words in their oral language sample was not significant ($r = .09$, $df = 54$, $p > .05$). This relationship was also not significant for children within each grade level (2nd: $r = .01$, $df = 26$, $p > .05$; 5th: $r = .26$, $df = 26$, $p > .05$).

Retelling Task

The written language hypothesis was tested by evaluating the effect of language structure on comprehension. This was a planned, orthogonal contrast comparing the mean retelling score for all versions with written language structures to the mean retelling score for all versions without written language structures. Across both grade levels and across both stories the mean

retelling score for versions with written language structures was, as predicted, lower than the mean retelling score for versions without written language structures (\bar{X} with = 52.50, \bar{X} without = 55.32). The difference between the two means, however, only approached significance ($t = 1.71$, $df = 55$; $p < .10$). The proportion of total variance accounted for by this factor was small ($\hat{\eta}^2 = .01$).

A stronger effect was produced by the stories themselves. The mean retelling score for "Don't Forget" (60.83) was greater than the mean retelling score for "Helping a Friend" (46.98). This effect for story was significant ($F = 71.25$, $df = 1,48$, $p < .001$) and accounted for a substantial proportion of variance in the sample ($\hat{\eta}^2 = .22$). The interaction between language version and story was not significant ($F = 1.90$, $df = 1,48$, $p > .05$).

The effect due to Language Order was not significant ($F = 0.001$, $df = 1,48$, $p > .05$) as were the effects for Story Order ($F = 0.26$, $df = 1,48$, $p > .05$), and Condition ($F = 0.72$, $df = 3,48$, $p > .05$). It is possible, though, that a slight learning effect may have occurred between trials. Children, across grade levels, stories, and language versions, had lower mean retelling scores on Trial 1 ($\bar{X} = 52.27$) and higher mean retelling scores on Trial 2 ($\bar{X} = 55.54$). The effect due to Trial just reached significance ($F = 3.98$, $df = 1,48$, $p = .05$). The difference in the means between Trial 1 and Trial 2 may be due to strategy shifts as children gained an understanding of the particular demands required for successful performance on the comprehension task. Students may have either read the second story in a slightly different manner (i.e. attempted to remember more for the retelling) or retold the second story in a slightly different manner (i.e. their retellings on the second story were more exhaustive).

It is possible that the effect of written language structures across story and grade levels was not very pronounced because of the anticipated interaction

between language version and proficiency. The written language x proficiency interaction hypothesis predicted that the interference effect produced by written language structures would be greater among second graders than among fifth graders. By calculating the effect of language structures across both grades, the performance of fifth grade students may have reduced the overall negative influence of written language structures on comprehension. This, in fact, seems to be the case as shown in Figure 2. Among fifth grade students, mean retelling scores actually increased slightly for story versions with written language structures (\bar{X} without = 57.89; \bar{X} with = 58.54). Among second grade students mean comprehension scores decreased substantially (\bar{X} without = 52.73; \bar{X} with = 46.36).

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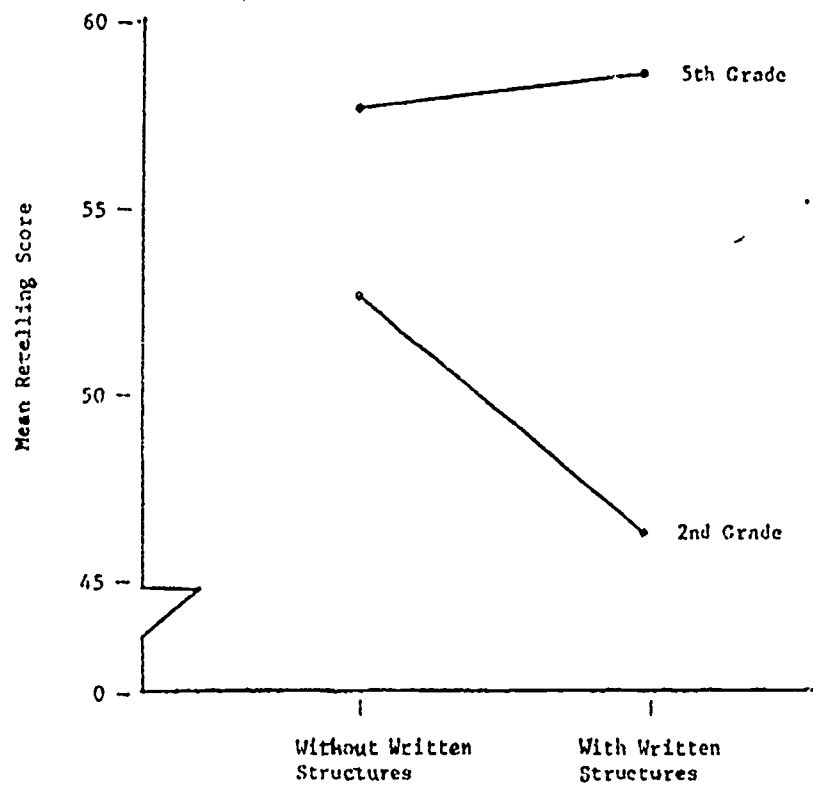
INSERT FIGURE 2 HERE

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The significance of the apparent written language x proficiency interaction was tested by comparing the difference in mean retelling scores for the two language versions among second graders to the difference in mean comprehension scores for the two language versions among fifth graders. The interference effect on reading comprehension produced by written language structures was determined to be significantly greater at the second grade level than at the fifth grade level ($t = 2.17$, $df = 55$, $p < .05$), thus confirming the written language x proficiency interaction hypothesis. The existence of written language structures in written discourse did interfere more with the reading comprehension of the younger, less proficient readers in this population.

From Figure 2 it is also apparent that fifth grade students had a higher mean retelling score ($\bar{X} = 58.27$) than second grade students ($\bar{X} = 49.54$). The difference between these means was significant ($F = 9.25$, $df = 1, 48$, $p < .004$). The proportion of the total variance in retelling score explained by grade level

FIGURE 2. THE EFFECT OF LANGUAGE VERSION ON RETELLING SCORES AT 2nd AND 5th GRADE



was moderate ($\eta^2 = .09$). Fifth graders appear to have comprehended their story versions better than second graders, at least as measured by this retelling task.

Except for the interaction between grade level and language version none of the other grade level interactions on unadjusted mean scores were significant. There were no significant interactions between Grade x Language Order ($F = 3.48$, $df = 1,48$, $p > .05$), Grade x Story Order ($F = 0.00$, $df = 1,48$, $p > .05$), Grade x Story x Language ($F = 0.23$, $df = 1,48$, $p > .05$), Trial x Grade ($F = 1.24$, $df = 1,48$, $p > .05$), Story x Grade ($F = 1.15$, $df = 1,48$, $p > .05$) or Trial x Grade x Language Order x Story Order ($F = 0.03$, $df = 1,48$, $p > .05$).

The existence of written language structures in written discourse did differentially effect the reading comprehension of second and fifth grade students. Among second graders, written language structures produced a drop in comprehension when compared to their comprehension on similarly constructed stories without these structures. Among fifth graders, written language structures produced a slight increase in comprehension. In addition, fifth graders generally understood the stories better than second graders.

The third and fourth hypotheses were tested by evaluating the strength of the coefficient of correlation between students' written feature production scores and their reading comprehension difference scores within each grade level. It was expected that increasing familiarity with written language structures would be associated with a decrease in the interference effect on reading comprehension, i.e. as written feature production scores increased, reading comprehension difference scores should decrease.

At the second grade level, results supported the written language x oral language interaction hypothesis. There was a significant, negative correlation between written feature production scores and reading comprehension difference scores ($r = -.73$, $df = 26$, $p < .05$). As these second graders reflected increasing

familiarity with the syntactic characteristics of written discourse, the interference effect on reading comprehension produced by these structures diminished.

Separate regression analyses were performed between retelling scores and written feature production scores for the two language versions. A significant, positive association ($r = .67$, $df = 26$, $p < .05$) appeared between retelling scores and written feature production scores for stories with written language structures. A non-significant association ($r = -.22$, $df = 26$, $p > .05$) appeared for stories without written language structures. These results are presented in Figure 3 which also indicates that when written feature production scores reach 2.0 students' predicted retelling scores became greater for versions with written language structures. Thus, for second graders with high written feature production scores the existence of written language structures in written text actually had a facilitative effect.

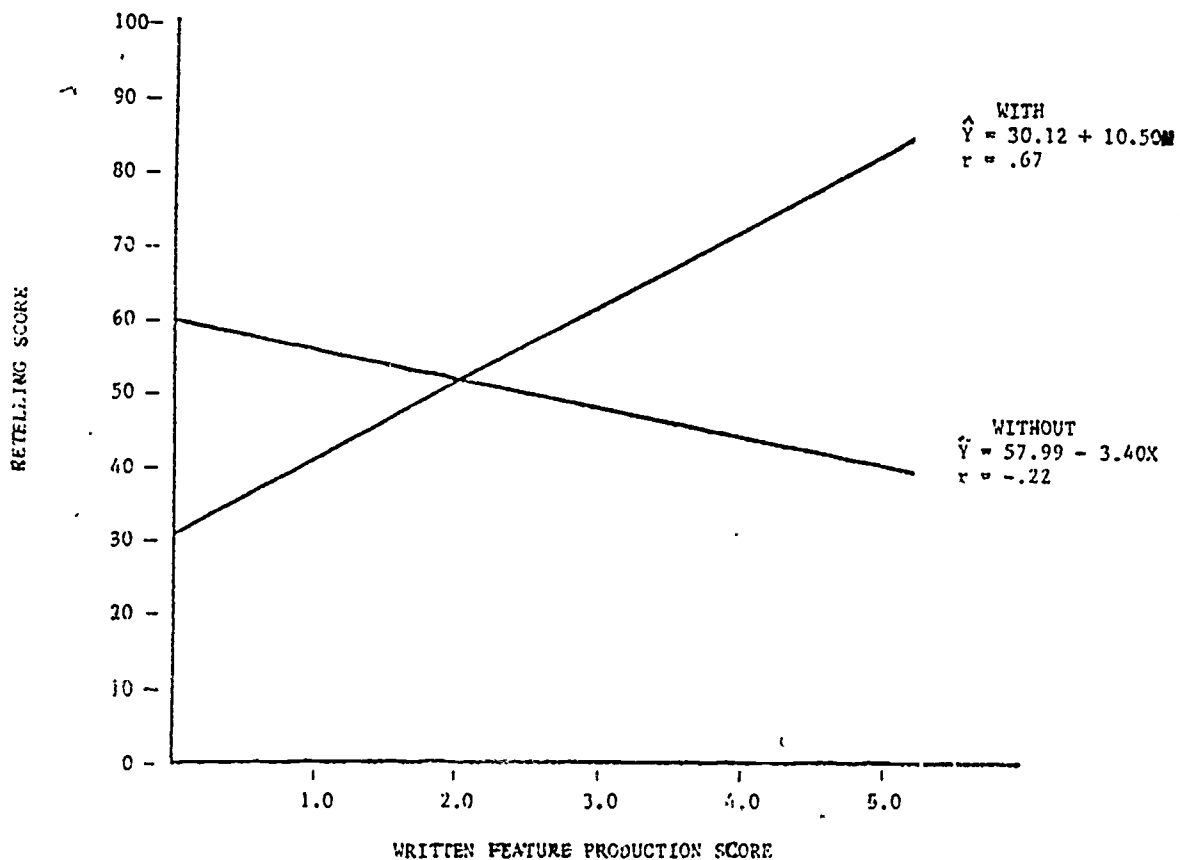
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INSERT FIGURE 3 HERE

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At the fifth grade level, results did not support the written language x oral language interaction hypothesis. There was a non-significant correlation between written feature production scores and reading comprehension difference scores ($r = .21$, $df = 26$, $p > .05$). Contrary to results found among second graders, predicted reading comprehension difference scores did not change as written feature production scores increased. Separate regression analyses were again performed between retelling scores and written feature production scores for the two language versions at the fifth grade level. Non-significant associations appeared between retelling scores and written feature production scores for stories with written language structures ($r = .26$, $df = 26$, $p > .05$) and for stories without written language structures ($r = .12$, $df = 26$, $p > .05$). These appear in Figure 4.

Figure 3. Slopes of Retelling Score Regressed on Written Feature Production Score for Stories With and Without Written Language Structures (2nd Grade Students).



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INSERT FIGURE 4 HERE

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Oral Reading Task

In order to determine how inappropriate syntactic expectations contributed to comprehension differences, oral reading errors at written language structure locations were analyzed. Taped oral reading protocols were transcribed following the procedures of Simons and Chambers (1979). The reliability of this method is reasonably high. Percentage of agreement between different transcribers ranges from 72% to 93% depending on the category of the error.

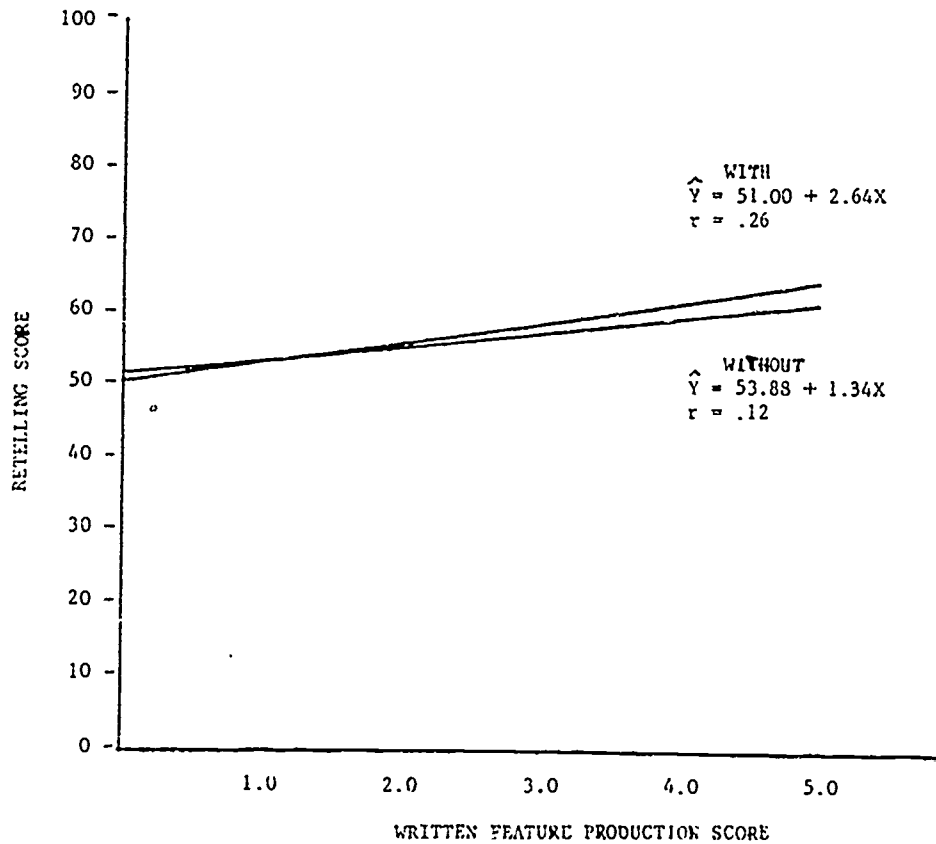
Initially, two types of errors were included in the analysis:

1. Errors and error clusters indicating that children rearranged surface syntax at written language structure locations.
2. Errors that did not completely rearrange surface syntax but nevertheless suggested that children anticipated a surface structure different from the one in the text at a written language structure location.

Single word substitutions, repetitions, omissions, and insertions which did not rearrange surface syntax were excluded from analysis. Syntactically related errors, occurring at a single written language structure location, were scored as a single error cluster.

A preliminary, qualitative analysis of syntactic errors at written language structure locations suggested that most errors reduced syntactic integration or resulted in syntactic patterns which were not only less complex, but also have been found to occur far more frequently in oral discourse. Errors which also met either of these criteria were referred to as oral discourse errors since they appear to reflect hypotheses about upcoming text based on the syntactic probabilities of oral, not written discourse. Typical oral discourse errors included

FIGURE 4. SLOPES OF RETELLING SCORE REGRESSED ON WRITTEN FEATURE PRODUCTION SCORE FOR STORIES WITH AND WITHOUT WRITTEN LANGUAGE STRUCTURES - 5th GRADE SUBJECTS



those which changed embedded participial phrases and their surrounding clauses into a series of coordinated clauses, substituted active for passive verbs, substituted the coordinated conjunction and for the relative clause marker that, and omitted the embedded subordinate clause marker when. Examples can be seen in Figure 5.

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INSERT FIGURE 5 HERE

* * * * *

Errors reflecting expectations for the syntactic characteristics of oral discourse appeared at 9.5% of the written language structure locations (106/1120). Almost half of oral discourse errors occurred at participial phrase locations. Second graders produced more oral discourse errors (63) than did fifth graders (43). The difference in the mean number of oral discourse errors by grade level (2nd = 2.25, 5th = 1.54) was significant (1-tailed $t = 1.89$, $df = 54$, $p < .05$). Table 1 reports the frequency of oral discourse errors by written language structure location and grade level.

* * * * *

INSERT TABLE 1 HERE

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If oral discourse errors reflect a general insensitivity to the syntactic patterns which appear more frequently in written language one would anticipate a significant, negative relationship between the frequency of oral discourse errors and written feature production scores. This was, in fact, the case among 2nd grade students ($r = -.42$, $df = 26$, $p < .05$). Children who were relatively unfamiliar with the syntactic characteristics of written language tended to produce more oral discourse errors. A similar relationship was not found,

At Participial Phrase Locations:

- (1) Mary^{was} walking to her friend's cabin^{c-saw and [s]/} saw Sally[∅]
- (2) Mr. Smith^{called} calling Mary[∅], asked for help.

At Appositive Phrase Locations:

- (1) One day, Jim forgot to give his horse, Silver^{silver/∅}, food^(Food) and water.^{silver/∅ food}
- (2) After she told her dad,[/]Mr. Smith[∅] he was not very happy.

At Passive Verb Locations:

- (1) It ^{c-was used} (was) used by Mary Baker, who was Sally's best friend.
- (2) One day, the boat was lost[∅] by Sally[∅]

At Relative Clause Locations:

- (1) He looked in the window ^{c-that was by and was by} that was by Jim's head.

At Subordinate Clause Locations:

- (1) The next day,[/](when) Jim got up^{c-his at} his horse was missing.

KEY

called
calling = word substitution error

Mary[∅] = punctuation substitution

Mary^{was}_∅ walking = insertion error

It (was) used = omission error

Mary[∅] walking = omission of punctuation

her dad,[/] = pause greater than 2 seconds

TABLE 1

Frequency of Oral Discourse Errors by Written Language Structure Location and Grade Level

	<u>2nd Grade</u>		<u>5th Grade</u>		<u>Totals</u>	
	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>
Participial Phrases	31 (112)	27.7	18 (112)	16.1	49 (224)	21.9
Appositive Phrases	14 (112)	12.5	13 (112)	11.6	27 (224)	12.1
Relative Clauses	6 (112)	5.4	7 (112)	6.3	13 (224)	5.8
Passive Constructions	7 (112)	6.3	2 (112)	1.8	9 (224)	4.0
Subordinate Clauses	5 (112)	4.5	3 (112)	2.7	8 (224)	3.6
Totals	63 (560)	11.3	43 (560)	7.7	106 (1120)	9.5

however, among 5th grade students ($r = .28$, $df = 26$, $p > .05$). Children at this grade level who were relatively unfamiliar with the syntactic characteristics of written language did not tend to produce more oral discourse errors.

Recall Task

The interference effect on comprehension produced by oral discourse errors was assessed by analyzing recall performance to specific question probes. Recall performance at oral discourse error locations was the focus of the analysis. At 53.8% (57/106) of oral discourse error locations 2nd and 5th grade students were unable to successfully recall information in the text. In relative terms, the frequency of unsuccessful recalls was not strongly influenced by the written language structure where the error appeared, ranging from 44.4% for errors at appositive phrases to 62.5% at subordinate clauses. Since far more oral discourse errors appeared at participial phrase locations (49), however, the absolute effect of errors at this location was greater than at any other location.

Individual "interference scores" were used as a dependent measure in order to observe the effects of grade level and written feature production score on recall performance at oral discourse error locations. A student's interference score consisted of the ratio of unsuccessful recall probes at oral discourse error locations over their total number of oral discourse errors. Thus, if a student produced five oral discourse errors and was unable to recall the information at any of the written language structure locations where they occurred, the student received an interference score of 1.00 ($5/5 = 1.00$). Interference scores therefore, reflected the probability that an oral discourse error would result in a failure to recall information at the location where it occurred. Mean interference scores were greater for 2nd grade students ($\bar{X} = .59$) than 5th grade students ($\bar{X} = .47$) indicating that oral discourse errors were more likely to interfere with recall among younger students. The difference between

the means, however, was not significant ($t = 1.52$, $df = 42$, $p > .05$).

Interference scores were significantly related to written feature production scores at the second grade level ($r = .43$, $df = 22$, $p < .05$) but not at the fifth grade level ($r = .28$, $df = 26$, $p > .05$). Among second graders, a lack of familiarity with written discourse structures was associated with a greater likelihood that each oral discourse error would disrupt comprehension. Among fifth graders, a lack of familiarity with written discourse structures was not associated with a greater likelihood that each oral discourse error would disrupt comprehension.

DISCUSSION

Results based on the two product measures, retelling scores and reading comprehension difference scores, generally support the notion that written language structures impede the comprehension of young readers. There were, however, several results suggesting that developmental factors were involved in a somewhat unexpected manner. The findings indicate that 1) the existence of written language structures had only a slight interference effect on the comprehension of the total sample used in this study, 2) the interference effect on comprehension was greater among younger students, and 3) it was greatest among those younger students least familiar with written language structures. Results based on the two process measures, oral discourse errors and interference scores, suggest that an inappropriately structured anticipatory system may explain the interference effects of written language patterns on the comprehension of young readers.

Contrary to expectations, clear support was not demonstrated for the written language hypothesis when the effect of language structure was evaluated across both 2nd and 5th grade levels. The failure to find a significant effect for language structure appears due to the fact that 5th grade students were

relatively insensitive to this manipulation. The mean comprehension score for fifth graders was unexpectedly higher on passages with written language structures. Second grade students, on the other hand, were very sensitive to the manipulation of language structure. A separate 4×2 (Condition \times Trial) repeated measures ANOVA within the second grade level revealed a significant negative effect for written language structure ($F_{1,24} = 6.84, p < .05$) indicating that written language structures impeded comprehension among these younger readers.

Clear support was found for the written language \times proficiency interaction hypothesis. The interference effect produced by written language structures was greater among second grade students than among fifth grade students. It is not likely that the significant main effect for Grade Level influenced this result. This would only be a possibility if a ceiling effect on retelling scores existed at the fifth grade level. A ceiling effect did not take place. Mean retelling scores by fifth grade students reflected a middle range of possible scores (\bar{X} without = 57.89, \bar{X} with = 58.54).

Confirmation was also found for the written language \times oral language interaction hypothesis at the 2nd grade level. Among second graders, increasing familiarity with written language structures is negatively associated with the interference effect that these structures produce during reading comprehension. In fact, children who reflected high levels of familiarity with written language structures actually benefitted from stories containing these structures.

Surprisingly, the written language \times oral language interaction hypothesis was not confirmed at the 5th grade level. As older students increasingly reflected familiarity with written language structures there was not an associated decrease in the interference effect produced by these structures. This may have resulted from older students' high level of familiarity with the syntactic patterns found more frequently in written language. That is, increasing

familiarity with written language structures may not facilitate reading comprehension beyond a certain level. Fifth graders, it should be recalled, had significantly higher mean written feature production scores than second graders.

The results based on the two process measures (oral discourse errors and interference scores) indicate that a faculty anticipatory system at the syntactic level may explain the interference effects of written language structures on comprehension. Qualitative analysis of oral reading errors at written language structure locations revealed high expectations for less integrated discourse structures. In addition, errors often indicated high expectations for coordinated syntactic patterns. Both types of error are consistent with the interpretation that young children formulate inappropriate expectations during the reading process based on their knowledge of oral discourse patterns.

The frequency of oral discourse errors was inversely related to familiarity with written language structures among second graders but not among fifth graders. In addition, as second graders reflected less familiarity with written language structures they were also less likely to recall information when oral discourse errors occurred. This pattern was not observed at the 5th grade level. Younger students who were least familiar with written language structures thus experienced a combination of two negative effects on comprehension: they produced higher frequencies of oral discourse errors and a greater likelihood that each error would disrupt comprehension. Because the process-based results parallel the earlier product-based results, they support the interpretation that the interference effect on comprehension found in this study was due to a conflict between written discourse structures and oral discourse expectations. The conflict is especially pronounced among younger readers who are relatively unfamiliar with written discourse structures.

When they come to school young children's knowledge of linguistic organization apparently reflects their largely oral language experiences. Relatively unfamiliar with the syntactic probabilities of written discourse, their hypotheses about upcoming text are often determined by an inappropriate set of expectations. Hypotheses based on the syntactic probabilities of oral discourse often conflict with the more integrated patterns of written discourse. As a result, comprehension suffers.

The findings from this study suggest that acquiring familiarity with the structure of written discourse may be an important instructional objective in the elementary classroom. Exactly how this should be done is less clear. Several types of activities may increase familiarity with the structure of written discourse: listening to stories rich in syntactic integration, having teachers maintain their adult "register" when talking to students, providing more frequent writing activities, or providing specific instruction in using more integrated syntactic patterns such as takes place in sentence-combining activities. The latter may prove to be especially productive since there is some evidence (Obenchain, 1971), and speculation (Stotsky, 1975; Shanahan, 1980) that it has a beneficial effect on reading comprehension.

Future research should be directed at understanding how familiarity with written discourse patterns is acquired among beginning readers. Are children with high written feature production scores exposed to more written discourse experiences at home before coming to school? Do these children's parents read to them more often? Do these children generally hear more complex patterns in their oral language experiences? Understanding how familiarity with written discourse structure is acquired is an important first step in deciding which instructional practices are most likely to be beneficial.

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APPENDIX A. TWO LANGUAGE VERSIONS OF ONE STORY USED IN THIS INVESTIGATION

2nd Grade
Without Written Structures

HELPING A FRIEND

School was closed and Sally went to the lake. The lake was really pretty. Her mother and father had a small cabin and it was next to the Baker's cottage. They lived there in the summer. It was too hot and dirty in the city.

Sally had a boat and it was small and went fast. Mary Baker was Sally's friend and she used the boat too. They played at the lake and had fun. Sam was Mary's dog and he played with them.

One day, Sally lost her boat. Sally told her dad and he was not happy. His name was Mr. Smith. He called Mary and asked for help.

Almost two hours went by and then Sam found the boat. Mary took the boat home and placed it by the door to the kitchen.

Mary walked to her friend's cabin and saw Sally. "Your blue boat is by my door," she said. "Go get it."

"Thank you," said Sally. Then Sally ran to get the boat and she fell. Sally got up and then she saw the boat. "Dad will be happy," she said.

2nd Grade
With Written Structures

HELPING A FRIEND

When school closed, Sally went to the lake. It was a very pretty lake. Her mother and father had a small cabin, which was next to the Baker's cottage. They lived there in the summer. They didn't like the hot, dirty city.

Sally had a boat, a small one, that went fast. It was used by Mary Baker, who was Sally's best friend. Sally and Mary, playing at the lake, had lots of fun. Sam, Mary's dog, played with them.

One day, the boat was lost by Sally. After she told her dad, Mr. Smith, he was not very happy. Mr. Smith, calling Mary, asked for help.

Before two hours went by, the boat was found by Sam. It was taken by Mary to her house. She placed it by the door that was near the kitchen.

Mary, walking to her friend's cabin, saw Sally. "Your boat, the blue one, is by my door," she said. "Go get it."

"Thank you," said Sally. Then, running to get the boat, she fell. Sally, after she got up, saw the boat. "Dad will be so happy," she said.