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ABSTRACT

This study investigates oral language characteristics of 100 first-grade children to determine the relationship between selected measures of oral language and reading achievement at the end of first grade. Using the Stanford Achievement Test, Reading, the study shows statistically significant, but low, correlations existing between the comprehension subtest scores and oral language measures of average utterance length, average T-unit length, number of words in garbles, Syntactic Density Score, and Developmental Sentence Score. Results from three groups, formed according to stanine scores in reading comprehension, reveal statistically significant differences in the measures of average utterance length, average T-unit length, and the Syntactic Density Score. Five stepwise multiple regression analyses showed that average utterance length and the number of words in garbles were the only two significant predictor variables. A bibliography is attached. (Author/RL)

AN INVESTIGATION OF THE RELATIONSHIP OF SELECTED ORAL LANGUAGE MEASURES AND FIRST-GRADE READING ACHIEVEMENT

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The focus on oral language as a potential variable affecting reading achievement has become increasingly important as educational researchers seek to find correlates of reading success. The child's success in learning to read is affected by his attitudes, motivation, and developmental level of perception and cognition. Many educators, however, believe that the key factor can ultimately be found in the development of approaches that exploit what is currently known about the nature of the reading process and the role of the child's language in that process. The reading process has been described by many as a language-based process (Carroll, 1964, 1970; Ruddell, 1969; Goodman, 1967).

Rationale

A realization of the need to "identify and evaluate all significant contributions to literature in (a) language development related to reading, (b) learning to read, and (c) the reading process" and "to describe the hypotheses and tests central to developing research...." (Kling, 1971, pp. 3-4) resulted in the United States Office of Education's

sponsorship of "The Literature Search in Reading" (Davis, 1971), a project of the Targeted Research and Development Program in Reading (MacGinitie, 1976).

MacGinitie (1976) identified, organized and discussed research suggestions from the "Literature Search in Reading," several of which follow. He stated that,

> The similarities, differences, and relationships between expressive competence and receptive competence and between oral and written language are research problems of fundamental importance but are seldom even acknowledged. The potential contribution of most studies of language development to our understanding of reading can scarcely be realized until these questions are recognized and studied (p. 17).

Athey (1971) would concur with MacGinitie (1976) that while the relationship between language development and cognitive development is widely recognized, its nature is a matter of great theoretical controversy. Concluding that research has not zeroed in on this relationship as directly as possible, Athey stated that while a great deal is known about children's intellectual development, more precise study is needed to investigate the role of language in cognition and the role of cognition in language growth. Because these two factors are so important in the reading process, their interaction must be of some concern to researchers trying to understand the nature of reading. Citing research areas that would be important contributions in relating child language development to reading, Athey commented:

> Little work has been done until quite recently on language development during the elementary years (five to ten years) especially as it is affected by educational factors. Such evidence as there

> is...shows that there is considerable growth in the acquisition of complex language competence during these years, but the relationship to development of reading ability is less clear. More information of this kind is sorely needed (pp. 99-100).

In her review of language models, she concluded that there was a need for more studies of children's spontaneous language and writing as these interact with their early experience in reading.

Entwisle (1971) recognized the relationship between oral language development and reading as she emphasized the importance of oral language as a prerequisite for learning to read and the foundation of later growth and development in reading. She noted, "Almost no work exists on the relationship between oral language and reading achievement, although it is known that there is considerable variability in oral language across social or ethnic groups or both" (p. 132).

Wardhaugh (1971) is in agreement with Athey and Entwisle that there is a need to study language development beyond school entrance and that oral language is important as a basis for beginning reading instruction.

The present study was undertaken in response to the need for new and continued attempts to clarify the relationship of oral language and reading cited in the aforementioned review of the "Literature Search in Reading," a review based on the opinions of linguists and specialists in the field of reading and empirical research of the past fifty years.

Purpose of the Study

This study was designed to examine the relationship between two language skills, reading and speaking, among first-grade children. The purpose of the study was to investigate oral language characteristics of first-grade children to determine the relationship between selected measures of oral language and reading achievement at the end of first grade. The investigation focused on the following questions:

1. What is the relationship between selected measures of oral language and reading achievement at the end of first grade?
2. Are there differences in the oral language characteristics of first-grade children reading above grade level, at grade level, and below grade level?
3. Can oral language measures be used to predict vocabulary test scores, word reading test scores, comprehension test scores, word study test scores, and total reading test scores on a first-grade reading achievement test?

Assumptions

The major assumptions of this study were:

1. Oral language is the primary form of language. Other language skills such as reading and writing must be based on oral language.
2. Reading is considered to be a continuation of the language acquisition process.
3. Reading is language. It is one of the four language processes through which communication may occur.
4. The beginning reader is a competent language user. He has the ability to process oral language, get to its underlying structures

and construct meaning through an internalized knowledge of the symbols, rules, and patterns of language.

5. The oral language samples recorded for each subject are representative of the subject's narrative speech patterns.

Significance of the Study

Aside from the fact that topics as vitally important as studying child language development or searching for correlates of successful reading achievement demand continued research, the significance of the present study may be found in several of its features.

First, no previous investigations could be identified in the reading and language literature which employed this particular combination of oral language and reading variables. While there is much opinion surrounding this issue, a minimal amount of research which examines the relationship of oral language and reading achievement of the beginning reader has been conducted.

Second, the oral language samples were obtained through carefully planned and uniformly controlled conditions which can be clearly described and replicated without difficulty.

Third, the present study utilized the computer to analyze the highly specific oral language variables. Previous investigations have relied on laborious identification and hand-tallying of measures of vocabulary diversity and syntactic complexity.

Review of Related Literature

Evidence regarding the relationship between oral language development and reading achievement can be gleaned either directly or tangentially from a number of significant investigations. Some researchers have attempted to relate measurable aspects of oral language to the prediction of reading

achievement. Other investigators have examined child language development as a basis for the development of instructional materials which would parallel oral language patterns. Another interest of many researchers has been the collection and analysis of data in an attempt to determine interrelationships among language variables. McCarthy (1954), Carroll (1960), Berko and Brown (1960), Ervin and Miller (1963), Diebold (1965), Bougere (1968), MacGinitie (1969), Fox (1970) and Brown (1973) have summarized previous research efforts.

Since the middle 1920s, three eras of research endeavors may be identified. First are the studies conducted during the scientific period which utilized the traditional Latin-based grammar. Next, research inquiries influenced by the structural theorists were reported. Finally, investigations based on the transformational theory of grammar were conducted.

Pre-1960 studies of children's language development derived their methods from traditional grammar components and focused on characteristics concerned with 1) length of total response, 2) sentence length, 3) frequency tabulations of simple, compound, complex, and incomplete sentences, 4) distribution of sentence types, 5) kinds of subordinate clauses and their ratios to each other as well as to main clauses, 6) relative frequencies of the eight parts of speech, and 7) the tabulation and cataloging of errors. Oral language studies based on these traditional grammar concepts were conducted by Smith (1926), McCarthy (1930), Day (1932), Davis (1937), Williams (1937), Carroll (1939), Gibbons (1941), Shire (1945) Hahn (1948), Yedinack (1948), Milver (1951), Martin (1955), Winter (1957), Templin (1957), and Morrison (1962). The results of these studies indicated that, within groupings of higher chronological age, mental age and parental occupation,

children produced increasingly longer utterances, spoke more words, and used more different words. Sentence length and the number of different words spoken were accepted as reliable measures of language maturity.

The major thrust of the investigations conducted by the structural theorists of the 1960s was toward a detailed description of the overt structure of language, that is, the ways in which phonological, morphological, and syntactic units were patterned in the speech of native speakers of English. Rather than classify words as parts of speech as was characteristic of the traditional grammar era, words were categorized according to the way they were used in a sentence. Investigations by Strickland (1962), Loban (1963), Hocker (1965), Riling (1965) and others applied analyses derived from structural linguistics. These studies resulted in conflicting evidence as to the usefulness of sentence length as a measure of language maturity. Results indicated that linguistic maturity could be better measured by examining flexibility within structural patterns and the occurence of mazes. Few studies used this format however, for by the time it was employed in educational research, the validity of structural grammar was being contested by the transformational grammarians.

The thrust of transformational grammar was toward an explanation of the ways in which native speakers generate sentences and toward the formulation of a system of rules which govern sentence production. Oral language development and the relationship between oral language and reading achievement have been studied during the transformational era by Menyuk (1963, 1964), Hunt (1965), O'Donnell, Griffin, and Norris (1967), Bougere (1968), Fox (1970), Farris (1970), Walker (1970),

Sheldon (1971), Stewart (1972), Shepherd (1973), Ciani (1974), Harris (1975), Ribovich (1975), and Dahl (1975). The major difference between the research of this era and the others exists primarily in the means used to answer the questions. The transformational era differed in the measures used to examine oral language development. The T-unit was found to be a consistent, objective measure of sentence-combining and deletion transformations and was used in the majority of research studies conducted during this era.

Methods and Procedures

Subjects. One hundred first-grade students were randomly selected from the 361 first-grade children enrolled in thirteen classrooms in the six public elementary schools of one school district located in a middle socioeconomic level community in northern Indiana. The 48 boys and 52 girls who participated in the study were non-bilingual Caucasian children ranging from five years ten months to eight years four months of age.

Collection of Data. The Stanford Achievement Test, Primary Level I Reading, Form A (Madden et al., 1972), a standardized group-administered achievement test used as the measure of reading achievement in the present study, was administered to the subjects at the end of the first-grade school year. The following five subtest scores were considered: 1) Vocabulary, 2) Reading Part A, Word Reading, 3) Reading Part B, Reading Comprehension, 4) Word Study Skills, and 5) Total Reading.

Individual interviews were conducted with each of the 100 subjects to obtain oral language samples. All subjects were interviewed by the investigator herself to ensure consistent, uniform methods of asking questions to elicit language samples. Each subject was asked to respond to a set of four questions which had been standardized in a previous study (Hopkins, Moe, and Stephens, 1975) of oral language elicitation probes used to collect language samples from young children and which had been successful in stimulating oral language production. The questions used to elicit the language samples were:

1. "What is your favorite game?" After the subject stated what his favorite game was, he was asked, "Tell me how you play it."
2. "What is the best thing that ever happened to you?" When the subject answered this question, he was asked, "Why is that the best thing that ever happened to you?"
3. "Tell me a story. It can be one that you make up or one that you have heard before."
4. "What is your favorite television show?" After the subject had named his favorite program, he was asked, "What happened on that show the last time you watched it?"

The subject was allowed three minutes to respond to each question. To encourage the child to continue talking for the allotted time, the investigator interjected brief verbal stimuli unrelated to the topic such as, "Oh, really?" or "Uhuh" when the subject stopped speaking. When such comments by the investigator elicited no further response or when there was a prolonged hesitation, two final questions were asked of those children who had not exceeded the time limit. The first question was, "Tell me more about _____(your favorite game,

the best thing that ever happened to you, etc.)" The second and final question asked was, "What else can you tell me about _____? " The order in which the questions were asked was rotated from subject to subject.

The subjects' responses to the four questions in the oral language interviews were transcribed by the investigator from the cassette tape recordings. All speech from the child, both spontaneous and in response to the investigator's questions, was considered to be part of the language sample. From these transcriptions, the following ten oral language variables were studied:

1. Total Number of Words Spoken. The total number of words spoken refers to the total language output of the subject during the interview. All words were counted, even if they were part of a language garble. Syllables such as "uhuh," "huheh," "huh," and "um" representing positive and negative or questioning expressions were not included in the transcripts and were therefore not counted as words. Special word-counting criteria were adopted to evaluate some words which were considered to be special cases.

2. Total Number of Different Words Used. A measure of the number of different words used was obtained by using the same criteria employed for counting the total number of words spoken.

3. Corrected Type-Token Ratio. The corrected type-token ratio is a linguistic measure designed to determine richness or diversity of vocabulary independent of sample size. It

reflects a relationship between the number of types (different words) and the number of tokens (total words) in a language sample. The ratio is calculated by dividing the number of different words by the square root of twice the total number of words in the sample.

4. Number of Words Not on the Thorndike List. Another measure used to assess vocabulary diversity was a count of the number of words used by each subject which did not appear within the first 500 words on the Thorndike-Lorge list published in The Teacher's Word Book of 30,000 Words (Thorndike and Lorge, 1944). It was believed that the child who employed words not on the list exhibited a more diverse vocabulary than the subject who did not use words beyond these first 500.

5. Average Utterance Length. The length of each utterance was determined by the natural break in verbalization of the child himself rather than on the basis of the complete adult sentence. The utterance was considered to be finished if the child came to a complete stop, either letting his voice fall, giving interrogatory or exclamatory inflection, or indicating clearly that he did not intend to complete the sentence.

6. Total Number of T-Units. The T-unit is a grammatical structure which consists of a main clause with all its subordinate clauses. Separating a passage into T-units

involves dividing it into the shortest units which it is grammatically allowable to punctuate as sentences.

7. Average T-Unit Length. Average T-unit length was determined by dividing the total number of words in T-units by the total number of T-units. Greater average T-unit length is considered to be evidence of greater language complexity.

8. Number of Words in Garbles. Garbles are words which are extraneous to the T-unit, that is, they add no meaning to the T-unit. These phenomena consist of word or word-sequence revisions used by the speaker. A count of the words in garbles was believed to be evidence of syntactic maturity, although it must be noted that it is an inverse relationship; the fewer number of words contained in garbles, the more mature the language is thought to be.

9. Syntactic Density Score. The Syntactic Density Score is a computer-determined index of syntactic complexity. The frequency of occurence of each of ten linguistic variables (the number of words per T-unit, the number of subordinate clauses per T-unit, the main clause word length, the subordinate clause word length, the number of modals, the number of be and have forms in the auxiliary, the number of prepositional phrases, the number of possessive nouns and pronouns, the number of adverbs of time, and the number of gerunds, participles, and absolute phrases) is weighted, the products are summed, and the total is divided by the number of T-units

in the sample to compute the Syntactic Density Score.

10. Developmental Sentence Score. The Developmental Sentence Score, a result of Developmental Sentence Analysis, is a procedure for evaluating the grammatical structure of complete sentences. Fifty sentences are examined for the presence of eight grammatical structures (noun modifiers, pronouns, main verbs, secondary verbs, negatives, conjunctions, interrogative reversals, and wh-questions). When all 50 sentences in the language sample have been individually scored, the mean sentence length is obtained by totaling the individual sentence scores and dividing by 50. This number represents the child's Developmental Sentence Score.

It should be noted that the first nine oral language measures described above were determined through computer analyses of the written text. Only Developmental Sentence Scores were hand-tallied.

The criterion variables were the five reading measures. The predictor variables were the ten oral language measures. These variable names are listed in Table 1.

Results

Hypothesis One. The first basic hypothesis stated that there were no significant positive relationships between selected measures of oral language and reading achievement at the end of first grade. In order to determine whether any relationships did, in fact, exist

TABLE 1

VARIABLES INCLUDED IN THE INVESTIGATION

Variable	Variable Name
Criterion Variables	
1	Stanford - Total Reading
2	Stanford - Vocabulary
3	Stanford - Word Reading
4	Stanford - Comprehension
5	Stanford - Word Study
Predictor Variables	
6	Total Number of Words Spoken
7	Number of Different Words Used
8	Corrected Type-Token Ratic
9	Number of Words Not on Thorndike List
10	Average Utterance Length
11	Total Number of T-units
12	Average T-unit Length
13	Number of Words in Garbles
14	Syntactic Density Score
15	Developmental Sentence Score

between the oral language and reading variables, correlation coefficients were calculated. Table 2 presents the correlation matrix for the reading and oral language variables for the first-grade subjects in this study. Inspection of this data reveals statistically significant correlations for approximately half of the relationships between the oral language and reading variables. While statistically significant, the correlations were negligible to low according to Garrett's (1966) classification.

Several trends may be identified in the data when the relationships of the individual language variables with all of the reading variables are considered. The highest correlations were found between each of the five reading measures and the oral language variable of average utterance length. The range of these correlations was .28 to .38.

Of almost equal magnitude, the next highest group of significant correlations was found between each of the five reading variables and the oral language measure of average T-unit length. These correlations ranged from .25 to .37.

The next highest group of significant correlations was found for each of the five reading variables and the Syntactic Density Score oral language variable. The range of these correlations was .24 to .29.

The lowest group of correlations was found for each of the five reading variables and the oral language variable of the total number of T-units. These correlations ranged from .04 to .13.

Another consistent pattern on the correlation matrix was that there was a low negative correlation for each of the five reading variables

TABLE 2

INTERCORRELATIONS AMONG READING AND LANGUAGE VARIABLES

Variables Labels	Variable #	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Stanford-Total Reading	1	.63*	.96*	.94*	.94*	.14*	.17*	.18*	.13	.32*	.05	.29*	-.17*	.28*	.13
Stanford-Vocabulary	2		.68*	.54*	.59*	.25*	.25*	.18*	.21*	.38*	.13	.37*	-.11	.29*	.24*
Stanford-Reading Part A	3			.86*	.87*	.15	.19*	.19*	.12	.32*	.05	.32*	-.17*	.28*	.14
Stanford-Reading Part B	4				.80*	.11	.15	.16	.10	.30*	.04	.27*	-.20*	.26*	.18*
Stanford-Word Study	5					.12	.15	.15	.12	.28*	.05	.25*	-.15*	.24*	.06
Total # Words Spoken	6						.95*	.56*	.92*	.62*	.88*	.65*	.54*	.48*	.29*
Total # Different Words	7							.79*	.98*	.60*	.85*	.63*	.40*	.46*	.28*
Corrected Type-Token Ratio	8								.77*	.36*	.53*	.39*	.03	.30*	.18*
# Words not on Thorndike List	9									.52*	.86*	.55*	.44*	.40*	.21*
Average Utterance Length	10										.23*	.97*	.23*	.86*	.52*
Total # T-units	11											.25*	.43*	.09	.07
Average T-unit Length	12												.16	.33*	.26*
Words in Garbles	13													.16	.08
Syntactic Density Score	14														.48*
Developmental Sentence Score	15														

$p < .05$

and the oral language measure of the number of words in garbles. The range of correlations was -.20 to .17. These low negative correlations demonstrate that as reading scores increased, the number of words in garbles decreased. The better readers exhibited fewer garbles in their oral language.

Because none of the individual correlations showed a high degree of relationship between oral language measures and reading achievement scores, a decision was made to look at combinations of scores through canonical correlation analysis. As can be observed in the results of the analysis reported in Table 3, there were no significant canonical variables. The maximum correlation possible between the two sets of variables was $r = .51$, $p<.11$ which accounted for approximately 26 percent of the variance shared by the composite oral language and composite reading variables. However, while the canonical correlation analysis employing composite oral language and reading scores resulted in higher correlation coefficients than single paired comparisons obtained from Pearson product-moment correlations, these coefficients were not statistically significant.

TABLE 3

SUMMARY TABLE FOR CANONICAL CORRELATION ANALYSIS

Number	Eigenvalue (R^2_c)	Canonical Correlation	P
1	.26	.51	.11
2	.17	.42	.50
3	.09	.30	.82
4	.08	.28	.84
5	.01	.10	.98

The subhypotheses which stated that there was no relationship between first-grade reading achievement and the oral language measures of 1) the total number of words spoken, 2) the number of different words used, 3) the corrected type-token ratio, 4) the number of words not on the Thorndike list, and 5) the total number of T-units were not rejected. The subhypotheses which stated that there was no relationship between first-grade reading achievement and the oral language measures of 1) the average utterance length, 2) the average T-unit length, 3) the number of words in garbles, 4) the Syntactic Density Score, and 5) the Developmental Sentence Score were rejected.

Hypothesis Two. The second basic hypothesis of this study stated that there are no differences in the oral language measures examined in the language samples obtained from children reading above grade level, at grade level, and below grade level. The subhypotheses stated that when each of the oral language measures was considered individually there were no differences in the oral language performance of first-grade children regardless of their reading levels.

To test the second hypothesis, ten one-way analyses of variance were computed. A one-way analysis of variance was used in analyzing the data for each of the ten oral language variables. The data were divided into three groups based on the subjects' reading achievement subtest scores on the Stanford Achievement Test, Primary Level I Reading. Students whose scores fell within the stanine range of seven through nine were classified as subjects reading above grade level. Students whose scores fell in the stanine range of four through six were classified as subjects reading at grade level.

Students whose scores fell in the stanine range of one through three were classified as subjects reading below grade level. Of the 100 subjects who participated in the investigation, 49 were reading above grade level, 45 were reading at grade level, and 6 were reading below grade level.

The analysis of variance results showed statistically significant differences between the three reading groups on the variables of average utterance length ($F = 5.23$, $df = 2, 97$, $p < .01$), the average T-unit length ($F = 4.70$, $df = 2, 97$, $p < .01$), and the Syntactic Density Score ($F = 3.72$, $df = 2, 97$, $p < .05$). The mean differences between the three groups on the seven remaining oral language measures failed to reach significance. While the three significant F-ratios resulted in the rejection of the null hypotheses of equal population means for the average utterance length, average T-unit length, and Syntactic Density Score oral language variables, the ratios by themselves did not indicate which of the group means were significantly different from the others. Therefore, it was necessary to perform post hoc comparisons to analyze each possible pair of means to determine if the means were significantly different from one another and, if so, to locate these differences. The Scheffé test was used in an attempt to determine the means between which significant differences existed. The Scheffé test results revealed that while there were overall differences among the three groups on three of the language variables, it was not possible to locate these differences because the subsets were homogeneous. No pair of the group subsets had means that differed by more than the shortest significant range for a subset of that size.

The subhypotheses which stated that there was no difference in the measures of 1) total number of words spoken, 2) the number of different words used, 3) the corrected type-token ratio, 4) the number of words not on the Thorndike list, 5) the total number of T-units, 6) the total number of words in garbles, and 7) the Developmental Sentence Score in the oral language of children reading above grade level, at grade level, and below grade level were not rejected. The subhypotheses which stated that there was no difference in the measures of 1) average utterance length, 2) average T-unit length, and 3) the Syntactic Density Scores in the oral language of children reading above grade level, at grade level, and below grade level were rejected. The results of these analyses are presented in Table 4.

Hypothesis Three. The third basic hypothesis stated that oral language measures could not be used to predict test scores on a first-grade reading achievement test. To test this hypothesis, stepwise multiple regression analyses were performed for each of the five criterion variables. For each of the five stepwise multiple regression analyses there were only two significant predictor variables, average utterance length and the number of words in garbles. The average utterance length, the best predictor of all reading test score variables accounted for a range of only 7.80 to 14.20 percent of the variance. When the second best predictor, the number of words in garbles, was added, the maximum amount of the variance accounted for was in the range of 12.56 percent to 18.42 percent. Because there was an oral language predictor for each of the reading measures, all five subhypotheses were rejected.

TABLE 4

SUMMARY TABLE OF TEN ONE-WAY ANALYSES OF VARIANCE

Source	df	MS	F
Total Number of Words			
Between Ss	2	151258.90	1.48
Within Ss	97	102332.31	
Number of Different Words			
Between Ss	2	7485.12	1.80
Within Ss	97	4153.49	
Corrected Type-Token Ratio			
Between Ss	2	.40	1.10
Within Ss	97	.36	
Number of Words Not on Thorndike List			
Between Ss	2	1366.55	.94
Within Ss	97	1450.36	
Average Utterance Length			
Between Ss	2	10.02	5.23**
Within Ss	97	9.92	
Total Number of T-units			
Between Ss	2	461.88	.40
Within Ss	97	1153.87	
Average T-unit Length			
Between Ss	2	2.42	4.70**
Within Ss	97	11.40	
Number of Words in Garbles			
Between Ss	2	1320.28	.69
Within Ss	97	1907.98	
Syntactic Density Score			
Between Ss	2	.31	3.72*
Within Ss	97	.08	
Developmental Sentence Score			
Between Ss	2	9.11	1.66
Within Ss	97	5.49	

* $p < .05$
** $p < .01$

Discussion of Findings

Hypothesis One. The findings reported regarding the relationship between oral language and reading variables are of particular interest with respect to previous studies reported in the literature. Earlier it was stated that as the relationship between oral language and reading achievement was examined across three grammatical eras, there were considerable differences in beliefs as to what were the most reliable indices of oral language maturity. Traditional grammarians believed that sentence length was the most reliable measure of oral language maturity. The reliability of the measure of average sentence length was challenged by researchers during the structural grammar era as they searched to find more refined measures of oral language complexity such as the phonological unit and the communication unit. During the next era, the transformational grammarians believed the presence of numerous T-units to be the most reliable index of syntactic maturity. This belief was not supported by Bougere's research (1968) in which she investigated selected factors in oral language related to first-grade reading achievement. Using some of the same measures incorporated in the present study, Bougere reported correlations of $r = .02$ for the Stanford Word Reading test scores and the number of T-units, $r = -.04$ for the Stanford Reading Comprehension test scores and the number of T-units, and $r = .04$ for the Stanford Vocabulary test scores and the number of T-units.

In the present investigation, the correlations between the number of T-units and the reading subtest scores were also very low. In view of the results obtained in Bougere's study (1968) and the present study,

the number of T-units in children's oral language are not significantly related to first-grade reading achievement. It is of interest to note, however, that while the variable of number of T-units had the lowest positive relationship to reading achievement of all the language variables, the second highest group of correlations for reading and oral language measures was for the average T-unit length. The magnitude of these correlation coefficients was nearly identical to those of the average utterance length. Thus, the relationship between reading achievement and the average utterance length, the dominant oral language measure of the traditional era, and reading achievement and the average T-unit length, the alleged best oral language measure of the transformational grammar era, appears to be the same in the present investigation.

The next highest group of correlations for reading and oral language measures was for the Syntactic Density Score, a measure which is based on the T-unit. This would suggest that the average T-unit length combined with other linguistic measures is more closely related to first-grade reading achievement than the measure of the number of T-units considered alone.

The size of the correlation coefficient is directly related to the range of the variables being correlated. In the present investigation, the range in reading test scores was smaller than the range in the oral language measures and may be one explanation for the lack of high correlations. Another may be the method used to assess reading achievement. In the present investigation, reading achievement was assessed by means of the reading comprehension subtest on a group

achievement test, whereas oral language was individually assessed by ten different measures. On the reading subtest, the subjects were required to select the correct word to complete the meaning of a sentence from a choice of three words provided. Thus, the task was a receptive language task. During the interview, the child was asked to respond to open-ended questions in a productive language task. It may be that if reading were assessed by requiring the subjects to use the productive language skills employed in oral language performance, that the nature of the tasks required would be more similar and perhaps the relationship between oral language and reading achievement would be stronger.

Hypothesis Two. The results of the ten one-way analyses of variance revealed statistically significant differences in three of the oral language characteristics examined in the language samples of first-grade children reading above, at, and below grade level. Examination of the actual scores on language variables reveals that there was a wide range in values for each of the oral language variables for students at each of the three reading levels, yet the means and standard deviations were very close for each of the three groups. There was more deviation within a given level than between the mean socres of each of the three groups. Strickland (1962) also found there to be more variation in oral language performance for subjects within a grade level than for the mean scores between grade levels. These findings may also be influenced by the size of the three groups. The groups consisting of subjects reading above grade level and at grade level had 49 and 45 students respectively. The group consisting of subjects reading below grade level had only six students in it.

Hypothesis Three. From the regression analyses, it was determined that the maximum amount of the variance in reading scores which could be accounted for by the oral language measures examined in the present investigation ranged from 12.56 to 18.42 percent. It can be seen that by using these ten oral language measures, it is not possible to accurately predict the first-grade reading achievement test scores. It is possible that the nature of the instrument used to measure reading achievement contributed to the low predictive ability of the oral language measures. The range of possible scores on the oral language measures had no limits. Each instance in which a subject exhibited one of the ten language characteristics was counted, resulting in a range of possible scores on the language measures which was limited only by the time limit set for each child's interview. Each subject had the opportunity to demonstrate his maximum language performance ability. Conversely, the subjects were not able to demonstrate the full extent of their reading ability because of the nature of the reading instrument. The range of reading scores was limited by the number of test items. It is likely that some of the students who obtained the maximum score on the reading subtests could have answered more questions correctly had there been additional items at higher levels of difficulty. Thus, the range in reading scores would likely have been greater than the range of scores obtained on the present form of the reading instrument used. Had this been the case, it is possible that the correlations between oral language and reading achievement measures would have been higher and the prediction of reading achievement scores at the end of grade one more accurate.

Recommendations

Many educators have claimed that there is a strong relationship between children's oral language ability and their reading achievement. The results of the present investigation do not support the existence of a strong relationship between these two abilities. The correlations between selected oral language measures and reading achievement at the end of grade one were low and the oral language measures did not accurately predict reading achievement scores. However, the results do support the existence of such a relationship, even though it is not as strong as the investigator had anticipated. The fact that there were significant relationships between selected measures of oral language and reading achievement at the end of first grade would suggest the need for continued research in this area. Additional research is needed to determine the minimum level of oral language performance necessary for success in learning to read. To further the research in this area, specific recommendations for future research include the following suggestions.

Efforts to discover ways of measuring oral language ability which, when used singly or in combination with other linguistic measures, will be better predictors of reading achievement than those employed in previous research investigations should be continued.

An investigation of the value of the oral language measures selected for use in the present study to predict reading scores obtained from reading tasks requiring productive language abilities is desirable.

A follow-up investigation of the subjects who participated in the present study would be of value in determining the relationship between their reading achievement at higher grade levels and their reading achievement and performance on oral language measures in grade one.

A replication of the present investigation with children at an intermediate grade level would be of help in examining the relationship of oral language and reading achievement in older subjects who have been exposed to several years of reading instruction.

A replication of the present investigation with subjects at different socioeconomic levels and children of minority groups would be of interest to determine whether the relationship between oral language and reading achievement is the same as that found for the subjects in the present investigation.

Finally, there is a need for future investigations to explore qualitative aspects of children's oral language in addition to the quantitative measures employed in the present study. New methods and procedures for examining the content and the quality of oral language behavior need to be developed to extend current knowledge about the relationship between oral language and reading achievement.

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