DOCUMENT RESUME

ED 141 835 CS 203 542

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TITLE Syntactical Complexity and Vocabulary Diversity in Two Groups of Children's Books.
PUB DATE 76
NOTE 57p.; Report prepared at Ohio State University

EDRS PRICE MF-$0.83 HC-$3.50 Plus Postage.
DESCRIPTORS *Childrens Books; *Childrens Literature; Content Analysis; Oral Reading; *Prereading Experience; Preschool Education; *Reading Research; *Syntax; *Vocabulary; Vocabulary Development

ABSTRACT

This study compared syntactic complexity and vocabulary diversity in two groups of books that can be used for reading aloud to preschool children: books recommended by authorities in reading and children's literature for reading aloud and "grocery store" books (small, inexpensive picture books that can be purchased in grocery stores). Trade names for the latter included Little Golden Books and Wonder Books. There were no significant differences in syntactic complexity, measured by mean T-unit length, between the two groups of books. Similarly, three measures of vocabulary difficulty showed little, if any, difference between the groups. It was concluded that the groups of books expose children equally well to the diverse vocabulary and complex syntax with which they must contend when they attempt to learn to read independently. (Author/AA)

SYNTACTICAL COMPLEXITY AND VOCABULARY DIVERSITY IN TWO GROUPS OF CHILDREN'S BOOKS

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STATEMENT OF THE PROBLEM

In order to foster readiness for reading, parents are frequently encouraged to read aloud to their preschool children. Reading aloud to children is believed to have several educational values. One such value is in acquainting children with the syntactic patterns encountered in "book language." A second value is that concepts are formed and words are attached to these concepts as children are exposed to new ideas and new vocabulary through books.

In suggesting that parents read aloud to preschool children, authorities in children's literature and reading frequently provide lists of suggested books (Dalgliesh & Duff, 1974; Huck & Kuhn, 1968; Larrick, 1964; Rogers, 1972). The lists usually include what is considered to be "the best" in children's literature. The books on the list are also usually quite expensive. Although books of good children's literature may be borrowed free from the public library, many parents patronize the library only infrequently, if at all.

There are, however, other books which may be read aloud to preschool children which are more accessible to many parents. The greater accessibility is due to both purchase price and to location of sale. These are the so-called "grocery store" books. Available in grocery stores, drug stores, and discount stores are "Little Golden Books",[1] "Wonder Books"[2] and other series by a number of publishing companies. Grocery store books are modestly priced and are located in a facility patronized weekly or more often by most parents.

Authorities in reading and children's literature have criticized grocery store books, however, on the basis that they lack literary merit. A cursory comparison of these books with recommended books reveals that many grocery store books do lack the fine characterization, depth and originality of plot, theme, and fine writing style usually associated

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[1] "Little Golden Books," is the registered trademark of a series of books by Western Publishing Company, Inc., Racine, Wisconsin.

[2] "Wonder Books, Inc." is a division of Grosset & Dunlap, Inc., New York.

with "the best" in children's literature. It is probable that exposure to high quality children's literature may be accomplished best with books other than grocery store books.

Other objectives in reading aloud to young children have been previously suggested, however; (1) to acquaint children with syntactical patterns encountered in "book language" and (2) to expose them to a wide diversity of vocabulary in order to increase their repertoire of known words. Although other differences between the two groups of books may exist, if there are no significant differences in syntactical complexity and vocabulary diversity, parents who may be unable to purchase the more expensive recommended books could be encouraged to buy and read aloud grocery store books to their young children for the purpose of fulfilling the latter two objectives.

PURPOSE OF THE STUDY

The purpose of the study was to compare the syntactical complexity and the vocabulary diversity of two groups of books which can be used to read aloud to

preschool children. The two groups of books are: (1) books recommended by authorities in reading and children's literature and (2) "grocery store" books.

OPERATIONAL DEFINITIONS

The following terms are used in the report as they are defined in this section.

1. Picture book. A book in which the pictures are an integral part of the text and are considered to be of equal importance to it. A picture book may be a concept book, a counting book, an alphabet book, a first book, a storybook, or an informational book.
2. Recommended books. Picture books recommended by at least two of the three authorities in children's literature whose lists of commended books were examined.
3. "Grocery store" books. Small, inexpensive picture books sold in grocery stores. "Picture book" is defined as it is above. This does not include coloring books, cutout books, workbooks or other similar types of books that do not conform to the above definition of "picture book."

THEORETICAL FRAMEWORK

New theories of the grammar of our language (Chomsky, 1957) and of language acquisition in the human child (Slobin, 1971; Thomas, 1967) have arisen in recent decades and these are currently being supported by research findings (Chomsky, 1969; Ervin, 1961; Fox, 1970; Loban, 1963; McNeill, 1970; O'Donnell, Griffin, & Norris, 1967). Those theories, in turn, have given rise to new theories of reading acquisition (Goodman, 1970; Ryan & Semmel, 1969; F. Smith, 1971.) Research stemming from these theories and in support of them provides the framework for the present study.

Syntax and Reading

Research supports the hypothesis that speakers, even children, do have implicit knowledge of the syntactic structures of their language and that this knowledge is used during the reading process (Rode, 1974-75). Even young children have control over basic language structures, (Strickland, 1962) but there are some structures that only relatively

mature speakers control (Chomsky, 1969). A difference between syntactic structures produced by good readers and those produced by poor readers is also apparent (Ruddell, 1966; Strickland, 1962) and for this reason it has been suggested that the addition of a measure of syntactic complexity could add significantly to the predictive value of present readiness tests which attempt to predict first grade reading comprehension achievement (Bougere, 1969). For all readers, the comprehension of material read is related in some degree to the correspondence between syntactic maturity of the reader and the syntactic level of the material (Peltz, 1973-74; W. Smith, 1971) and to the degree to which the material is written with patterns, used frequently in the oral language of the reader (Ruddell, 1964; Tatham, 1970). The type of syntactic pattern also affects comprehension. Embedding and deletion transformations are particularly difficult for children to understand (Fagan, 1971), but there is less difficulty in comprehending these structures in a longer passage of material than in a sentence. The redundancy of language in a longer passage is an aid to comprehension (Fagan, 1971; Ruddell, 1965). Syntactic complexity also affects oral reading performance (Burke, 1975; Nurss, 1969; Siler, 1973-74).

Vocabulary and Reading

Young children's awareness of semantic constraints in oral language (James & Miller, 1973) and the use of this knowledge in reading (Rode, 1974-75) has also been substantiated. Word meanings constitute a large element of all the variables which lend to reading comprehension (Davis, 1944) and knowledge of multiple meanings of words and semantic sensitivity are significantly correlated with reading achievement (Roys, 1965; Svedman, 1970). Size of oral vocabulary has also been linked with some aspects of reading achievement (Bougere, 1969; Raulin, 1962). Vocabulary training can be effective in increasing concept development and reading achievement (Lieberman, 1966), and one type of "training", reading aloud to young children, has been shown to increase the quality and quantity of vocabulary knowledge (Cohen, 1968).

Oral Language Versus Written Language

The opinion of some authorities (Glazer, 1974; K. Goodman, 1970; Goodman & Sims, 1974; McDonnell, 1975; Moir, 1970; Vygotsky, 1962; Wilkinson, 1974)

that there is a disparity between oral language and written language, in regard to both syntax and vocabulary, has been supported by research. For example, the language of textbooks intended for use in reading instruction has been found to be different from the oral language of the children who use them (Goforth, 1966; Moe, 1974; Riling, 1965; Strickland, 1962). Authorities have provided examples of unusual ways vocabulary items may be utilized in written language to create an effect (Moir, 1970) and examples of ways in which syntax is used differently in oral speech than in written language have been cited (Labov, 1969; Riling, 1965). Some types of structures of written syntax which cause young readers difficulty have been identified (Glazer, 1974; Rode, 1974-75; Smith & Lindberg, 1973) and it has been suggested that there may be more disparity between written language and the oral language of children with some dialects than for speaker's of the dominant English dialect (Morgan, 1974; Goodman, & Sims, 1974). The importance of exposure to a wide variety of language models in order that rules of language structure become instrinsic has been

noted (Cashdan, 1973). In order to familiarize children with specialized forms of syntax and specialized uses of vocabulary found in book language, the instructional procedure of reading aloud to children has been proposed (Burke, 1974; K. Goodman, 1970; Goodman & Sims, 1974; McDonell, 1975).

Reading Aloud to Children In Relation to Their Reading Performance and Language Development

Reading aloud to children in elementary school grades from low income homes and to children who are low achievers does seem to aid vocabulary development and reading achievement (Bailey, 1970; Cohen, 1968; Fearn, 1971; Porter, 1970). The regularity of the treatment of hearing stories read and the length of time which the treatment is applied also seem to be factors related to producing reading achievement growth (Bailey, 1970; Cohen, 1968; Lyons, 1972). For children who read early, investigation reveals that they have heard books read aloud during the preschool years (Durkin, 1966;

Durkin, 1974-75). Hearing stories read can affect first grade reading achievement (Almy, 1949) and can also affect later reading interests (Mason & Blanton, 1971). Language development and hearing stories read aloud have been linked (Burroughs, 1967; Chomsky, 1972; Fodor, 1966; Irwin, 1960), and the syntactical complexity of stories listened to or read is also related to stage of lingistic development (Chomsky, 1972). Listening to books read aloud may facilitate readiness for coping with literary language better than is done by oral discussions (Lyons, 1972) and it is with younger students that many reading measures vary with socioeconomic status (Chomsky, 1972). This may be due to the fact that parents of higher socioeconomic status often read to their young children more frequently than is done by low income parents (Miller, 1969).

Summary

Familiarity with syntactic structures has been shown to be related to the comprehension of those structures in written materials. Knowledge of vocabulary is basic to understanding what is read.

Young children entering school are familiar with the basic structures used in oral language, however, it has been pointed out that the literary language with which children must learn to cope often differs from oral language both in structure and in uses and scope of vocabulary items. Many authorities have suggested that reading aloud to young children exposes them to this more elaborated form of language. Examining research related to reading aloud to children does indeed show that children's vocabulary is increased and reading comprehension achievement is raised when they hear literature read on a regular basis. This is especially true for young children, children from low income homes, and children who are low achievers in reading. It is reasonable to assume that a major reason reading aloud to children is correlated with a rise in reading achievement is the familiarity with the peculiarities of literary language that is gained. Hearing literature read exposes children to complex syntactic structures and diverse vocabulary not found in oral language but which is found in most reading materials. It can, therefore, be concluded that reading aloud to children from books which are more

syntactically complex and which have greater vocabulary diversity will prepare children better to contend with the type of syntax and variety of vocabulary they will encounter in the formal, elaborated language of instruction.

ANALYSIS OF THE DATA

The Sample

Sixty books were analyzed for syntactical complexity and vocabulary diversity. Thirty of the books comprised the group labeled as "recommended books." The other thirty books comprised the group labeled as "grocery store books."

The "Recommended Books"

The books recommended by authorities in reading and children's literature were selected in the following manner. Lists of recommended picture books were obtained from three authoritative sources. The sources were (1) the "Picture Books for Young Children" section of Adventuring With Books (Root, 1973); (2) the "Picture Books" section of Children's Literature in the Elementary School (Huck & Kuhn, 1968); and (3) the books listed for the preschool

child and kindergartner on the "Reading Level Index" in The Best in Children's Books (Sutherland, 1973). A composite list was prepared by comparing the books on the three lists. If a book appeared on two of the three lists it was selected to be on the composite list. Nine types of books were excluded from the composite list, however. The following types of books were excluded:

1. Mother Goose books. The rhymes are the same in these books regardless of whether they are printed in an inexpensive grocery store book or in a more expensive edition.
2. Anthologies. Only picture story books of single stories or with a single purpose, such as presenting rhymes for each letter of the alphabet, were included.
3. Books without words.
4. Songbooks.
5. Foreign language books.
6. ABC books with only one word to a page. These books were not suitable for syntactical analysis.
7. Non-fiction, with the exception of ABC books and counting books.
8. Books with a previously determined and controlled vocabulary.

9. Picture books not recommended for the preschool child. "Preschool child" is defined as a child five years of age or younger. If, for example, a picture book on Root's (1973) list was suggested for children ages seven through nine, it was not included on the composite list.

The total number of books on the composite list was ninety-four. These ninety-four books were listed and numbered sequentially. A table of random numbers was then used to select the thirty books to which the language analyses were applied.

The "Grocery Store Books"

The books labeled as "grocery store books" were selected in the following manner. The three largest grocery store chains in a large midwestern city were identified. All stores within each of these chains were listed and a number was assigned to each. The total number of stores was sixty-three. A table of random numbers was used to select ten stores from each of the three groups, thus providing a list of thirty stores. One book was randomly selected from each store. This was accomplished by taking to the store a table of random numbers. Then if, for

example, the first number in the table of random numbers was six, the sixth book from the top of the display was selected. The nine types of books that were omitted from the selection of the books recommended by authorities, and which are listed above, were omitted from the selection of grocery store books also.

The Language Analyses

Rationale for Selection of Measurement Procedures

The data obtained in a language analysis depend to some degree upon the approach to analysis used.

Measurement of syntactical complexity. When an investigator wishes to measure syntactical complexity, it would seem logical that the sentence would be the grammatical structure to examine. However, researchers have found the sentence to be an inadequate measure of syntactical complexity. Reasons for the finding are shown in Strickland's study of oral language (1962) and Hunt's study of written language (1965) in which sentences that were as long or longer than those produced by more mature subjects were frequently used by younger children, . . . children with less syntactic maturity.

To eliminate this distorting factor, Hunt (1965) investigated what students' sentences would be like if these "run-on" sentences were divided into simple sentences. The result was a grammatical structure which consists of a main clause with all its subordinate clauses. Hunt (1965) called this a "minimal terminable unit." For ease of expression the name of the structure is usually referred to as a T-unit.

In an attempt to determine if the T-unit was a valid index of syntactic complexity, Hunt (1965) compared the T-unit with three other factors, . . . sentence length, clause length, and subordination ratio. Hunt (1965) concluded that T-unit length was the best indicator of syntactic maturity, followed by clause length, then subordination ratio, and finally sentence length. Other researchers agree. In a later investigation, O'Donnell, Griffin, and Norris (1967) found that ". . . the mean length of T-units has a special claim to consideration as a simple, objective, valid indicator of development in syntactic control" (pp. 98-99).

As a response to the earlier opinion of McCarthy (1954) that sentence length is the important measure of syntactic complexity, Hunt (1965) states:

> Sentence length is indeed a significant index of maturity, but it is statistically less significant than at least three others which have been examined so far in this study. Any competent grammarian should find T-unit length or clause length or subordination ratio to be 'objective', quantitative', and 'reliable' though indeed not so 'easily determined' as sentence length. It is time for sentence length to be superceded (p. 48).

T-unit length was used to assess syntactical complexity in the present study.

Measurement of vocabulary diversity. Vocabulary diversity is the degree to which vocabulary items vary within certain aboundaries such as language spoken within a fixed period of time or the total number of words spoken or written in a specific language sample (Moe, 1974). For the present study, examination of vocabulary diversity was limited to the degree to which words written within specific language samples vary. Vocabulary diversity has been measured in a number of ways

in previous studies. At this time it has not been determined which of the measures provides the most adequate picture of the diverseness of vocabulary in oral and written language (S. Fox personal communication, April 21, 1975).

In Language and Thought (1964) Carroll describes a linguistic measure designed to determine richness or diversity of vocabulary. . . the type-token ratio. Carroll (1964) points out a weakness of this measure, however, and suggests a "correction" for it. Carroll (1964) states:

> Sometimes the type-token ratio (the number of different words divided by the number of total words) is used as a measure of the diversity or richness of vocabulary in a sample, but it should be noted that this ratio will tend to decrease as sample size increases, other things being equal, because fewer and fewer of the words will not have occurred in the samples already counted. A measure of vocabulary diversity that is approximately

> independent of sample size is the number of different words divided by the square root of twice the number of words in the sample (p. 54).

The corrected type-token ratio was one measure used to assess vocabulary diversity in the present study.

Another measure of vocabulary diversity can be obtained through use of the Waring-Herdan Formula. The formula is based upon Herdan's (1964) attempt to provide an equivalent of the normal curve for the distribution of vocabulary. This was accomplished by applying Waring's mathematical expansion for $1/(x-a)$ (Quantitative Linguistics, 1964, p. 86) and fitting it to language data. The Waring-Herdan Formula enables one to compare the actual distribution of words in a real language sample with the distribution predicted in Herdan's (1964) theoretical tables and to then calculate the amount of discrepancy between the two.

The usefulness of the Waring-Herdan Formula for comparing vocabulary diversity of texts having

different numbers of vocabulary items is substantiated by the following statements of Herdan (1964):

> Although the probabilities change with sample size, their gradient as expressed by successive terms of the Waring distribution remains the same. . . . The relation between successive terms of the series remains unaltered (invariant) despite the change in numerical values with sample size. . . . The invariance ratio of successive terms of the series shows the form of the distribution as independent of sample size and content and thus establishes its general linguistic nature (p. 89).

The Waring-Herdan Formula was used to provide a second measure of vocabulary diversity in the present study.

In The Teacher's Word Book of 30,000 Words (Thorndike & Lorge, 1944) the words are divided into three major sections. Part One, which constitutes the largest portion of the book, is devoted to a listing of words that occur once or more times per

million running words. Part Two is comprised of words that occurred less than once per million but oftener than four times per 18 million words in the counts. Part Three lists words that occurred four times per 18 million words. As can be seen, the words in Parts Two and Three are words of rarer occurence in English writing and therefore the words in Part One are those of greatest importance, especially when investigating vocabulary in literature books and textbooks intended for use with children.

In 1966, for a study of phoneme-grapheme correspondences in spelling words, Hanna (1966) used the Thorndike-Lorge list from The Teacher's Word Book of 30,000 Words (Thorndike & Lorge, 1944) but chose to use words only from Part One of the book, omitting the words of rarer occurence which comprise Parts Two and Three. Hanna (1966) also suggested a division of the words in Part One of the list into five frequency levels. He re-grouped Part One, as follows:

Thorndike-Lorge Frequency Code For Part One of The List of 30,000 Words			Regrouped Frequency Code
AA = 100	or more occurrences	pmw*	1
A = 99-50	"	"	2
49-30	"	"	3
29-10	"	"	4
9-1	"	"	5

*pmw = per million words

In 1968 a computerized data reduction program at the University of Chicago Computation Center used a tape of Part One of the Thorndike-Lorge list (Thorndike & Lorge, 1944) which had the words divided into the five frequency levels devised by Hanna (1966). However, more than 2,000 proper nouns, such as Excalibur, Bulgaria, and McGarthy, which had been a part of the original listing in Part One of the Thorndike-Lorge list (Thorndike & Lorge, 1944) were excluded from the computer tape. Conversely, forty-five contractions of varying degrees of occurrence, which had not been a part of the original listing in Part One were added to the list under the appropriate frequency levels. With the deletion of over 2,000 proper nouns and the addition of forty-five contractions, the computer tape contained 17,356 words from Part One of the Thorndike-Lorge list that

occur one or more times per million running words. This computer tape has been used to determine the percentage of words at Thorndike-Lorge frequency levels as one measure to assess extent and range of vocabulary in oral language protocols in one study (Bougere, 1969) and to compare vocabulary diversity in the oral language of kindergarten and primary school children in another (Fox, 1970). Companion studies to compare vocabulary diversity in four modes of writing at the fourth grade level (Nunn, 1974) and vocabulary diversity in four modes of oral language at the fourth grade level (Simms, 1974) also utilized the same computer tape containing the 17,356 words from Part One of the Thorndike-Lorge list (Thorndike & Lorge, 1944). The present study used this computer tape to determine the percentage of words at five frequency levels of the Thorndike-Lorge list as a third measure of vocabulary diversity.

The Analyses

All thirty books in the group labeled as "recommended books" and all thirty books in the group labeled as "grocery store books" were subjected to the analyses.

Syntactical complexity. The entire text of all books in both groups was segmented into T-units. The following practice in marking T-units, as described by O'Donnell, Griffin, and Norris (1967), was used:

> (A T-unit) may be a simple or complex sentence, but not a compound sentence. The practice of English writers has always allowed initiation of a sentence with a coordinating conjunction; in identifying T-units, then, a coordinating conjunction linking two independent clauses was regarded as the first element in the second clause (p. 37).

The end of each T-unit was marked with a slash (/). Example:

> The dogs and the kittens went out to play/ and they had a very good time./

Words which are extraneous to the T-unit are called garbles. Examples of garbles in literary material are one word exclamations, such as "Whooppee!", onomotopoeic words that have been punctuated, such as "Whoosh!", and sentence

fragments which stand alone but have been punctuated as sentences, such as "Big black hat." All garbles were circled and were eliminated from T-unit word counts.

Reliability in determining T-units was checked by randomly selecting a small sample of books and submitting them to an investigator who had used the procedure in a previous study. The percentage of T-units marked differently by the two investigators was less than .0008 percent of the total number of T-units, four of 4,625. Syntactical complexity was measured by mean T-unit length, which is determined by dividing the total number of words in T-units by the total number of T-units. Evidence of greater complexity is shown by greater mean T-unit length.

Vocabulary diversity. The entire text of all books in both groups was ahalyzed for vocabulary diversity. Words in garbles, which had been eliminated when analyzing the texts for syntactical complexity, were included in the word counts when analyzing the texts for vocabulary diversity. This one exception to this rule was foreign words that were not a part of an English sentence.

The analysis was carried out by key punching the entire texts of all books on computer cards and submitting the cards to computerized data reduction programs available at The Ohio State University. The printouts from these programs provided:

1. a listing of the complete corpus of words for each book
2. the number of types (different words) in each book
3. the number of tokens (total number of words) in each book
4. the corrected type-token ratio for each book
5. word usage frequency distributions for each book and a comparison of these with the Waring-Herdan theoretical tables
6. the number of words at selected Thorndike-Lorge frequency levels for each book
7. an alphabetical listing of all words in each book followed by each word printed in context, that is, with the several words immediately preceding and following each of the words as they were used in the text.

The vocabulary diversity of each book was determined for each of the three measures from information provided by the computer printouts.

The Statistical Analysis

For the statistical treatment, initially a multivariate analysis of variance (MANOVA) was employed to compare the two groups of books with respect to the sixteen dependent variables associated with the language measures of syntactical complexity and vocabulary diversity. The sixteen dependent variables were:

Variable 1= syntactical complexity;

Variable 2= vocabulary diversity, as measured by the corrected type-token ratio;

Variables 3-11= vocabulary diversity, as measured by the differences between the expected number of words occuring two through ten times as predicted by the Waring-Herdan Formula and the observed number of words at these frequencies in the sample; and

Variables 12-16= vocabulary diversity, as measured by the percentage of words at five selected

frequency levels of the Thorndike-Lorge list.

Subsequently, one-factor analyses of variance (ANOVAs) were performed on group means for each of the sixteen variables. The .05 level of probability was adopted for all analyses.

FINDINGS

Syntactical Complexity

Syntactical complexity was judged by examining mean T-unit length. Table 1 presents means and standard deviations for syntactical complexity for the two groups of books.

TABLE 1

Means and SDs of Average T-unit Length by Groups of Books

Books	Group Size	Group Means	Group SDs
Recommended	30	10.9631	4.50
Grocery Store	30	11.0378	6.08
Totals:	60	11.0004	5.30

A difference is seen between the two groups with grocery store books appearing to be slightly more

syntactically complex. These tentative findings were subjected to a multivariate analysis of variance (MANOVA) in which the findings were considered simultaneously with all other dependent variables in the study. The resultant Wilk's lambda of .717 fell short of significance ($F = 1.05$; $df = 16/43$; n. s., $p > .20$) thus preventing rejection of the null hypothesis of equality of means. A univariate analysis of variance (ANOVA) was also performed. In concurrence with the MANOVA, the one-factor ANOVA revealed that there was no significant difference ($F = .0029$; $df = 1/58$; n. s., $p > .20$) in syntactical complexity, as measured by mean T-unit length, between the group of recommended books and the group of grocery store books.

Vocabulary Diversity

The degree of vocabulary diversity is judged, in the present study, through the use of three different measures. Table 2 presents the means and standard deviations for vocabulary diversity, as measured by the corrected type-token ratio, for the two groups of books.

TABLE 2

Means and SDs for the Corrected Type-Token Ratio by Groups of Books

Books	Group Size	Group Means	Group SDs
Recommended	30	6.4873	1.66
Grocery Store	30	6.9500	1.51
Totals	60	6.7186	1.59

Although a small difference in favor of grocery store books is seen, the difference fell short of statistical significance when subjected to a multivariate analysis of variance (MANOVA), which produced a Wilk's lambda of .717 ($F = 1.05$; $df = 16/43$; n. s., $p > .20$), thus preventing rejection of the multivariate null. The MANOVA was followed-up with a univariate analysis of variance (ANOVA). In agreement with the MANOVA, the one-factor ANOVA also failed to demonstrate a significant difference ($F = 1.2683$; $df = 1/58$; n. s., $p > .20$) in vocabulary diversity, as measured by the corrected type-token ratio, between the group of recommended books and the group of grocery store books.

Based upon (a) the number of different words, (b) the total number of words, and (c) the number of

words occurring only one time, the Waring-Herdan Formula was used to predict expected word frequency distributions for each of the books in both groups of books examined in the study. The calculations were based upon distributions predicted in Herdan's (1964) theoretical tables and provided a listing of the number of words expected to occur two times, the number of words expected to occur three times, and so forth, through the number of words expected to occur ten times. Next, the actual number of words occurring two through ten times in each book for both groups of books was computed. The observed word frequency distributions of each book in both groups were then compared with the expected distributions predicted by the Waring-Herdan Formula and from the information the differences between the two were calculated.

An examination of Table 3 shows that differences occurred for all means between the groups of books.

TABLE 3

Means and SDs for the Differences Between Expected Word Frequency Distributions Predicted by the Waring-Herdan Formula and the Observed Word Frequency Distributions in the Sample by Groups of Books

Books	Group Size	Group Means	Group SDs
Recommended-Words occurring 2 times	30	-4.3857	7.91
Grocery Store-words occurring 2 times	30	-0.9203	5.27
Totals	60	-2.6530	6.89
Recommended--words occurring 3 times	30	2.5033	4.82
Grocery Store-words occurring 3 times	30	-0.0073	5.40
Totals	60	1.2480	5.23
Recommended-Words occurring 4 times	30	1.3607	3.86
Grocery Store-Words occurring 4 times	30	0.5840	3.34
Totals	60	.9723	3.60
Recommended-Words occurring 5 times	30	0.3503	2.59
Grocery Store-Words occurring 5 times	30	0.0530	2.49
Totals	60	0.2016	2.52

TABLE 3 (Cont'd.)

Means and SDs for the Differences Between Expected Word Frequency Distributions Predicted by the Waring-Herdan Formula and the Observed Word Frequency Distributions in the Sample by Groups of Books.

Books	Group Size	Group Means	Group SDs
Recommended--Words occurring 6 times	30	0.2040	2.48
Grocery Store-Words occurring 6 times	30	-0.7130	2.46
Totals	60	-0.2545	2.49
Recommended-Words occurring 7 times	30	-0.4730	2.90
Grocery Store-Words occurring 7 times	30	0.0457	2.05
Totals	60	-0.2136	2.51
Recommended-Words occurring 8 times	30	0.2697	1.34
Grocery Store-Words occurring 8 times	30	-0.1823	1.91
Totals	60	0.0436	1.65
Recommended-Words occurring 9 times	30	-0.0347	1.70
Grocery Store-Words occurring 9 times	30	0.2227	1.62
Totals	60	0.0940	1.66
Recommended-Words occurring 10 times	30	1.6690	1.04
Grocery Store-Words occurring 10 times	30	1.7127	0.67
Totals	60	1.6908	0.87

A particularly noticeable difference can be seen for the means of words occurring two times and the means of words occurring three times. However, when these data were subjected to the multivariate analysis of variance (MANOVA) mentioned earlier in which these nine variables were considered simultaneously with the seven other dependent variables in the study, significance was not achieved, thus preventing rejection of the null hypothesis of equality of means. Subsequently, univariate analyses of variance (ANOVAs) were performed. Each set of means for words occurring two through ten times were compared. In agreement with the MANOVA, all of the one-factor ANOVAs revealed that there were no significant differences ($F = 3.98$; $df = 1/58$; $p < .10$), ($F = 3.59$; $df = 1/58$; $p < .10$), ($F = .6924$; $df = 1/58$; n.s., $p > .20$), ($F = .2049$; $df = 1/58$; n.s., $p > .20$), ($F = 2.05$; $df = 1/58$, $p < .20$), ($F = .6362$; $df = 1/58$; n.s., $p > .20$), ($F = 1.16$; $df = 1/58$; n.s., $p > .20$), ($F = .3564$; $df = 1/58$; n.s., $p > .20$) ($F = .0348$; $df = 1/58$; n.s., $p > .20$) in vocabulary diversity, as measured by the Waring-Herdan Formula, between the group of recommended books and the group of grocery store books. It is interesting to note, however,

that for words occurring two times the difference fell only slightly short of statistical significance ($F = 3.98$; $df = 1/58$; $p < .10$) at the previously established .05 level when subjected to a one-factor analysis of variance (ANOVA). The difference was in favor of recommended books. Likewise, when subjected to ANOVA, for words occurring three times the difference also fell only slightly short of statistical significance ($F = 3.59$; $df = 1/58$; $p < .10$). This difference was in favor of grocery store books.

A computer program, The Thorndike-Lorge Look-Up, was used to compare the words from each book in both groups of books with the words at the five frequency levels of Part One of the Thorndike-Lorge list (Thorndike & Lorge, 1944). The printout from the program listed the number of words at each of the five frequency levels for each book. However, because a characteristic of the Thorndike-Lorge Look-up is to compare only root words, some erroneous information was given. For example, because it had an inflectional ending, the word houses was rejected as being a word unlisted on the Thorndike-Lorge list and was placed in the "0" (zero) frequency level, a category of rare or unlisted words. This was done

even though the word house does appear on the list. The problem occurred with many words. Therefore, a computer program especially prepared for the present study was designed at The Ohio State University Instructional Research Computer Center to remedy the problem. The program, The Root-Match Program, searched each word rejected by The Thorndike-Lorge Look-Up to determine the root word of that word, and then assigned the re-appraised word to the appropriate frequency level. The Root-Match Program performed the task relatively accurately, but occasionally the program found the wrong root word when searching a rejected word. For example, the root word of brakes was determined to be bra. Therefore, a manual scanning of the results of the program and occasional corrections were necessary.

At the conclusion of the three steps, (1) use of The Thorndike-Lorge Look-Up, (2) use of The Root-Match program, and (3) manual scanning and corrections, a corrected total for the number of words at each of the five frequency levels for each book was obtained. From the information, the percentage of words at each of the five selected frequency levels was determined, plus the percentage of words in the "0" frequency level.

The "0" frequency level was designated as a category that would include words that appeared in the selected books, but did not appear on the Thorndike-Lorge list. At the conclusion of the analysis, it could be seen that words from these two groups of books which were categorized into the "0" frequency level consisted of: (1) proper nouns, such as Abe and English; (2) rare words, that is words occurring less than once per million running words in the Thorndike and Lorge word counts, and therefore, not included in Part One of their list, ...for example, blasphemous and gondola; (3) onomotopoeic words such as br-r-r-r and aw-w-w; (4) certain compound words, ...for example, happylooking and hide-and-seek; (5) single letters of the alphabet, such as those that were listed in alphabet books; (6) words that were not in common usage in 1944, such as pizza; (7) coined words, such as snowgentlemen and elephantbird, and (8) slang words, such as "A lotta' bread". When items (1), (3), (4), (5), (6), (7), and (8) above were eliminated from the total counts of words in the "0" frequency levels the remaining words, that is, those described in item (2) as "rare words", could be tabulated. In the group of recommended

books there were ninety-eight such rare words. Examples of rare words in recommended books were banderilleros, camomile and poults. There were ninety-nine words in grocery store books designated as rare words. Examples of rare words in grocery store books were thimbleberry, snorkel, and bobtail.

Table 4 shows that a greater percentage of words occurred at frequency level one in recommended books and that a greater percentage of words occur at frequency levels two, three, four, and five in grocery store books.

Although the words categorized at the "0" frequency level were not considered in the final statistical analysis, it is interesting to note that the mean percentage of words occurring at the "0" frequency level for grocery store books was 6.69, while for the recommended books, the mean was 6.21. Therefore, although a larger mean percentage of words occurred at the "0" frequency level for grocery store books, the difference between the two was slight.

The five variables (1) percentage of words at frequency level one, (2) percentage of words at frequency level two, (3) percentage of words at frequency level three (4) percentage of words at

TABLE 4

Means and SDs for the Percentage of Words Occurring at Each of the Five Thorndike-Lorge Frequency Levels by Groups of Books

Books	Group Size	Group Means	Group SDs
Recommended-Frequency Level 1	30	.7904	0.0485
Grocery Store-Frequency Level 1	30	.7579	0..0598
Totals	60	.7741	0.0564
Recommended-Frequency Level 2	30	.526	0.0171
Grocery Store-Frequency Level 2	30	.572	0.0180
Totals	60	.548	0.0176
Recommended-Frequency Level 3	30	.0304	0.0146
Grocery Store-Frequency Level 3	30	.0413	0.0238
Totals	60	.0358	0.0204
Recommended-Frequency Level 4	30	.0379	0.0190
Grocery Store-Frequency Level 4	30	.0464	0.0229
Totals	60	.0421	0.0213
Recommended-Frequency Level 5	30	.0266	0.0172
Grocery Store-Frequency Level 5	30	.0303	0.0213
Totals	60	.0284	0.0193

frequency level four, and (5) percentage of words at frequency level five were included in the set of dependent variables which has been mentioned in connection with the analysis subjected to MANOVA that resulted in an overall nonsignificant result, thus preventing rejection of the multivariate null. As before, the MANOVA was followed up with univariate analyses of variance comparing each set of means for the five frequency levels. In concurrence with the MANOVA, the one-factor ANOVAs showed no significant differences ($F = 1.0373$; $df = 1/58$; n.s., $p > .20$) ($F = .0844$; $df = 1/58$; n.s., $p > .20$) ($F = .0546$; $df = 1/58$; n.s., $p > .20$) for the percentage of words at frequency levels two, four, and five of Part One of the Thorndike-Lorge list. However, in contrast to the MANOVA, the univariate ANOVAs for percentage of words at frequency levels one and three did show a statistically significant difference ($F = -5.3149$; $df = 1/58$; $p < .05$), ($F = 4.5082$; $df = 1/58$; $p < .05$) between the two groups of books. According to the ANOVAs a significantly greater percentage of words at frequency level one occurred in recommended books, but a significantly greater percentage of words at frequency level three occurred in grocery store books.

These two specific findings should be interpreted cautiously, however. The univariate tests revealing significance are of interest, but in the absence of the significance of the overall test associated with the MANOVA, there is the possibility that these evidences of statistical significance are actually Type 1 errors.

CONCLUSIONS

The following conclusions are based upon the findings related to the hypotheses examined in the study.

1. It can be concluded that no significant difference exists in syntactical complexity, as judged by mean T-unit length, between the recommended books and the grocery store books examined in the present study, nor for the groups of books to which the findings may be generalized.
2. In comparing vocabulary diversity through use of the three measures employed in the present study, evidence supports the contention that there is very little, if any, difference between the recommended books

and the grocery store books investigated, nor for the books to which the findings may be generalized. Because findings for thirteen of the fifteen variables related to vocabulary diversity were not shown to be significantly different on either statistical test, and because for the two remaining variables there was no significance for the overall test associated with the MANOVA, any differences in vocabulary diversity for the two groups of books is conceded to be slight.

IMPLICATIONS

The findings of the present study support the contention that there is very little, if any, difference between recommended books suitable for reading aloud to preschool children and grocery store books on the indices of syntactical complexity and vocabulary diversity. It seems, then, that the selection of books for reading aloud to preschool children may be approached in two different ways:

1. Only recommended books may be used with preschool children. These books are not

significantly different from grocery store books in syntactical complexity and vocabulary diversity, as well as being of high literary quality. Recommended books would aid in accomplishing both the goal of increasing reading achievement and the goal of increasing literary taste. This choice might, therefore, be the preferable one. It might also be the one more suited to parents who can afford to purchase the more expensive recommended books.

2. Parents with smaller incomes could be encouraged to buy and read aloud to their children the less expensive grocery store books for the purpose of exposing pre-school children to the syntactic structures of written language and to vocabulary more diverse than that which they might use in their oral language. This course can be recommended since the findings of the present study indicate that there is no significant difference in syntactical complexity and vocaublary diversity between

recommended books and grocery store books. In such cases, the school can assume the responsibility of exposing children to recommended books of high literary quality as a part of their regular program. Schools can also assume the task of encouraging parents to use the services of the public library, from which they can borrow recommended books at no cost in order to supplement the inexpensive books they purchase for their children.

In addition, teachers can introduce parents to the fine children's literature that has recently become available in inexpensive paperback editions. Availability of these books lessens the problem of high cost in purchasing recommended books, although the location of sale may not be as convenient for parents who do not tend to partronize bookstores and book departments of department stores.

RECOMMENDATIONS FOR FURTHER RESEARCH

1. The Waring-Herdan Formula revealed differences in word frequency distributions for the two groups of

books under study. In an examination of the words occurring two times and the words occurring three times, a qualitative as well as quantitative difference was noted between the two groups of books. Specifically, itwas noted that in grocery store books, a great many of the words occurring two times and occurring three times appeared to be function words, that is prepositions, and coordinates, while a larger number of words occurring two times and three times in recommended books appeared to be content words, that is, nouns, verbs, and adjectives. In order that a function word convey meaning, it must be heard or read in context since it gains its meaning from the words with which it is used. It might be argued, therefore, that exposure to content words would affect a child's language development more positively than exposure to function words. The qualitative difference seen here for words in recommended books and words in grocery store books may be reflected in the assertations of authorities in children's literature who argue that the "beauty" of the language encountered in books of high literary quality surpasses that to which

children are exposed in hearing or reading grocery store books. The quantitative measures in the present study do not measure such qualitative differences. It is recommended, therefore, that future research be undertaken to study a qualitative difference in language for the two groups of books by determining the number of content words versus the number of function words present.

2. In the present study a quantitative assessment of the syntactic structures in recommended books and grocery store books was undertaken, that is, the degree of complexity of syntax was measured. It is also important to determine the types of syntactic structures present in each of the groups of books. A qualitative assessment of syntax as a follow-up to the present study is recommended. The findings of such a study would reveal differences, if any, which exist in the variety of syntactic structures to which children would be exposed in hearing one or the other of two groups of books read aloud.

3. Computer programs greatly assisted in the assessments of vocabulary diversity in the present study. The assessment of syntactical complexity, however, was carried out manually. New computer programs are being developed to measure syntax. One of the programs has been prepared by Dr. Lester Golub of Pennsylvania State University. It is suggested that the texts of the books examined in the present study be key-punched on computer cards and submitted to one such program for the purpose of comparing those findings with the findings of this study. If no significant difference is found in assessment of syntax, future researchers might confidently use computer programs to analyze the syntax of written language in children's books as well as for the analysis of vocabulary.
4. A premise of the present study is that reading aloud to children exposes them to syntax more complex than that used in oral language and some vocabulary not known by children entering school. A comparison of the syntax and vocabulary in the books examined in the study, books that can be used for reading aloud to preschool children, with the oral syntax and oral vocabulary of

children of this age, would be of interest.

5. The present study did not assess the two groups of books for literary quality. Such an assessment should be undertaken along with a comparison of the quality of the illustrations between the two groups of books.

The research suggested above would serve to extend knowledge about the language of children's books, the literary quality of children's books, and research procedures to be used in continuing research in these directions.

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