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THE READABILITY OF THE EASY-TO-READ TRADE BOOKS

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

DOCTOR OF PHILOSOPHY

BY

MILDRED KNIGHT LAUGHLIN

Norman, Oklahoma

1973

THE READABILITY OF THE EASY-TO-READ TRADE BOOKS

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THE READABILITY OF THE EASY-TO-READ TRADE BOOKS

CHAPTER I

INTRODUCTION

In recent years trade book series for the beginning reader have been produced by a number of major publishing houses. New series are constantly being introduced. They bear eye-catching series titles such as Read-Alone Books or I Can Read Books to intrigue parents, teachers, and librarians concerned with children who are learning to read. The books are attractive in format, usually using bold type and frequent illustrations, and seldom exceed sixty-four pages in length. In addition, an attempt is made to choose plots which are interesting to young readers. As Durkin points out, "Because their themes often are masculine, they also accommodate young boys at a time when school programs can be overly feminine."[1]

With the increase in both federal and local funds for school libraries, the elementary librarian has answered the demand of the primary teacher for easy-to-read books by

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[1]Delores Durkin, _Teaching Young Children to Read_ (Boston: Allyn and Bacon, 1972), p. 302.

purchasing multiple copies of those titles from the series that are reviewed favorably in the Children's Catalog[2] and other selection aids. Because the books are appealing in format and content and bear an easy-to-read series title, elementary librarians often feel secure in placing them in the hands of the first and second grade children for independent reading.

Yet, are these series truly for a beginning reader? David Russell in 1961 was concerned with a need to evaluate easy-to-read books for young children. He analyzed ten popular easy books for primary children on the basis of

> (1) a subjective description of content and estimate of attractiveness and interest (2) an objective comparison of vocabulary (3) a rating by the Spache Readability Formula and (4) comments on the books by groups of first- and second-grade children and their teachers.[3]

He pointed out that the Spache Readability Formula was probably the best single measure of difficulty of primary materials. Yet, on this single basis, although labeled easy, the ten books ranged in difficulty from basal primer to second reader, second level.[4] Russell contended, however, that if the difficulty of each trade book were known and many were

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[2]Estelle A. Fidell, ed., Children's Catalog, 12th ed. (New York: H. W. Wilson Co., 1971), 1156pp.

[3]David H. Russell, "An Evaluation of Some Easy-to-Read Trade Books for Children," Elementary English 38 (November 1961): 375.

[4]Ibid., p. 378.

available, the teachers could use trade books to stimulate
student interest to a greater degree than is often possible
in conventional textbooks.

<div align="center">Need for the Study</div>

Hundreds of easy-to-read books have been written
since the brief Russell study, yet selection aids seldom give
the teacher or librarian a precise grade level. The Children's
Catalog, a standard selection aid, includes only an E, K-2,
K-3, 2-4, or 1-3 designation. Lester Wheeler, in commenting
on this wide-range grading problem, stated that materials
listed as suitable for grades one to three really give the
librarian little guidance in determining the mechanical dif-
ficulties of the books.[5] Thus, the librarian has the choice
of either giving the child reading matter which may reach
his frustration level or seeking some means of determining
the readability level of the book.

Because the Children's Catalog is such an accepted
selection aid, an attempt was made to discover the methods
their selectors used in reaching their grade level designa-
tion. In reply to a letter requesting the specific criteria
used in this determination, Thomas Sullivan, Associate Direc-
tor of Indexing Services, merely included the brief statement

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[5]Lester R. Wheeler and Edwin H. Smith, "A Practical
Readability Formula for the Classroom Teacher in the Primary
Grades," Elementary English 31 (November 1954): 398.

which precedes the Easy Books section of the 1972 Supplement

to the Children's Catalog.

> This section consists mostly of fiction books which
> would interest children from preschool through second
> grade. For the most part, those easy books which have
> a definite nonfiction subject content are classified
> with other nonfiction books. Easy books listed here
> include:
>
> 1. All picture books whether fiction or nonfiction
> which the young child can use independently.
>
> 2. Fiction books with very little text, widely
> spaced or scattered, with large print, and with vocabu-
> lary suitable for children with reading levels of grades
> 1-2.
>
> 3. Picture storybooks with a larger amount of text
> to be used primarily by or with children in preschool
> through grade 2.[6]

Obviously, this short statement provides little aid

for librarians in reading guidance for the first and second

grade children. In addition, many books in the easy-to-read

series are included in the fiction and nonfiction sections

of the Children's Catalog and are given a K-2, K-3, 2-4, and

1-3 grading.

Spache reported that many publishers of adapted or

simplified materials were making use of one or more formulas

for evaluation and grading purposes. He contended that read-

ability formulas, for specific purposes, are valid, justified

tools. They cannot determine the exact degree of difficulty

for all readers, but they can indicate the average reading

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[6]Barbara E. Dill and Estelle A. Fidell, eds., Chil-
dren's Catalog, 1972 supp. to 12th ed. (New York: H. W.
Wilson Co., 1972), p. 55.

ability needed for adequate comprehension of a specific book.[7]

He emphasized, however, that users should familiarize them-

selves with the research on which each formula is based, and

the type of material it is designed to measure.

Should librarians and teachers assume that the pub-

lishers' "easy-to-read" designations were the result of

specific evaluative technique? Mills and Richardson, in a

study of what primary textbook publishers mean by grade level,

concluded that the publishers needed more consistent methods

of textbook grading. They stated,

> We believe that the rise of comparable readability
> formulae is the best solution. It would be well if
> teachers, librarians and others charged with the respon-
> sibility of selecting books for young readers started
> questioning publishers more closely as to what means
> they employ for grading their books and perhaps make
> purchases accordingly.[8]

Since trade books are supplementing the texts in

reading programs throughout the United States, it seemed that

the actual readability of the easy-to-read series should be

given careful consideration by their publishers. The Book

Angles advertising brochure for Beginner Books series suggests

they are the best sellers ever. Their 1973 brochure states

that this one series alone has now sold over 55 million

copies. They give the underlying concept of the series as

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[7]George D. Spache, Good Reading for Poor Readers, rev.
ed. (Champaign: Garrard Publishing Co., 1972), p. 38.

[8]Robert E. Mills and Jean R. Richardson, "What Do
Publishers Mean by 'Grade Level'?" The Reading Teacher 16
(March 1963): 362.

an exact blending of words and pictures (with a dash of humor) that encourages a child to read by himself. The Beginner Book motto sums it all up: I CAN READ IT ALL BY MYSELF.[9]

It is not suggested that readability formulas or any other measures of readability be used except as a means of rating a piece of writing after it has been written. It was hoped that this study would point up the necessity for application by publishers and reviewers of some method of determining the readability of so-called "easy-to-read" books before they are purchased by librarians seeking first and second grade reading materials. Gray and Leary pointed out in 1934, "When we ask whether or not a book is readable, we meet the counter question: 'readable for whom?'"[10]

Statement of the Problem and Purpose

The problem of the study was to determine the readability level of the seventy-nine easy-to-read books receiving primary level grading in the 1971 Children's Catalog through the use of three readability formulas. This problem required the answer to the following questions:

1. What are the readability levels for the easy-to-read series, as indicated by both the mean and the upper limit of the subscores of the Fry, Spache and Wheeler-Smith readability level

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[9]Book Angles (New York: Random House, n.d.), unp.

[10]William S. Gray and Bernice E. Leary, "What Makes a Book Readable?" Journal of Adult Education 6 (October 1934): 408.

estimates and how do they compare with the
Children's Catalog grading?

2. What is the range of readability level within each
   book and within each series as a whole?

3. Do statistically significant relationships exist
   between the Fry and Spache Formulas, between the
   Fry and Wheeler-Smith Formulas, and between the
   Spache and Wheeler-Smith Formulas when applied
   to the easy-to-read books included in the
   Children's Catalog?

The purpose of the study was to make research infor-
mation on the readability of the easy-to-read books available
for teachers and librarians responsible for the selection of
trade books for beginning readers. Specifically the purpose
was three-fold:

1. To evaluate the primary level grading in the 1971
   Children's Catalog for the easy-to-read series
   through the application of three readability
   formulas.

2. To ascertain the range of readability within each
   book as determined by the formulas.

3. To calculate the extent of relationship between
   the readability level estimates derived by the
   Fry Formula and that determined by the Spache
   and Wheeler-Smith Formulas.

Definition of Terms

Several terms employed in the conduct of this study

were defined as follows:

1. Readability--"reading ease or comprehension

difficulty."[11]

2. Readability formula--

. . . a method of measurement intended as a predictive
device that will provide quantitative, objective esti-
mates of the style difficulty of writing.[12]

3. Trade book--

A book published for sale to the general public through
the book-selling trade, as distinguished from a textbook,
a subscription book, or a book meant for a limited public
because of its high price, technical nature, or special-
ized appeal.[13]

4. Easy-to-read-books--The general term applied to

Harper, I Can Read Books; Putnam, See and Read Books; Random

House, Bright and Early Books and those of the Beginner Books

division; Follett, Beginning to Read and Easy to Read Books;

Houghton, Read-by-Yourself Books; and Knopf, Read Alone Books.

5. Subscore--The readability level estimate for each

individual sample of a book used as a basis of computation

by each formula.

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[11]Jeanne S. Chall, Readability: An Appraisal of
Research and Application (Columbus: Ohio State University,
1958), p. 8.

[12]George R. Klare, The Measurement of Readability
(Ames: Iowa State University Press, 1963), p. 3.

[13]Elizabeth H. Thompson, ALA Glossary of Library Terms
(Chicago: American Library Association, 1943), p. 142.

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6. <u>Book mean</u>--The readability level estimate derived by averaging the subscores for each book as computed by each formula.

7. <u>Book range</u>--The difference between the high and low subscores for each book as computed by each formula.

8. <u>Series mean range</u>--The difference between the high and low book means for each series as computed by each formula.

9. <u>Series subscore range</u>--The difference between the high and low subscores for each series as computed by each formula.

Limitations of the Study

The use of formulas as a measure of readability necessitated consideration of certain limitations pointed out by Klare:

> First, formulas measure only one aspect of writing--style . . . Second, formulas measure only one aspect of style--difficulty . . . Third, formulas do not even measure difficulty perfectly . . . Fourth, formulas are not measures of good style.[14]

Klare noted that formulas do not measure whether the content is interesting or whether the word order, format and imagery of the writing is satisfying to the reader. In addition, formulas do not consider the purpose or maturity of the reader. However, he concluded, "Formulas can be highly

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[14]Klare, <u>Measurement</u>, p. 82-84.

useful to the professional communicator if these limitations
are kept in mind."[15]

The books under consideration in this study had a
format that was very similar within each series--pagination,
overall size, size of print, and number and layout of illus-
trations. In addition, the authors of the easy-to-read books
have demonstrated skill in making the content appealing to
primary readers. This investigator was concerned with the
books as they are used to increase reading proficiency. Since
they are usually used in schools as an extension of the basal
text or as a replacement for it, the ages and purposes of the
readers are similar. Thus, these readability formulas served
well the needs of this study of easy-to-read materials for
the primary reader in spite of their recognized limitations.

Organization of the Study

This study was concerned with the readability level
of the seventy-nine books from easy-to-read series which
received primary level grading in the 1971 Children's Catalog.
The Spache, Fry, and Wheeler-Smith Formulas were applied to
each of the books in order to derive readability estimates
for each book. The data were tabulated and reported in rela-
tion to the questions arising from the problem statement.

Specifically, Chapter I included a general introduc-
tion to the need for the study, a statement of the problem,

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[15]Ibid., p. 25.

the definition of terms, and the limitations of the study.
In Chapter II the historical aspects of readability were
considered and brief reviews of readability research were
reported. Chapter III detailed the design of study, includ-
ing the sources of the data, instrumentation, and procedures
for data evaluation. The presentation and interpretation of
the data were embodied in Chapter IV. The summary, findings,
and recommendations were reported in Chapter V.

CHAPTER II

REVIEW OF RELATED LITERATURE

The problem of providing material for beginning readers that is interesting and stimulating, yet simple, is of prime concern to teachers and librarians. As pointed out by Smith and Johnson, many attempts have been made to "quantify certain aspects of written material and in particular to provide an index of the ease with which the written language may be comprehended by the reader."[1] The development of readability formulas was an attempt to provide this index.

Historical Study of Readability

Readability was a concern of educators many years before the development of formulas, however. Klare pointed out that religious teachers made word and idea counts as early as 900 A.D.[2] Frequency of occurrence thus became an index by which to distinguish usual from unusual meanings.

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[1] J. R. Smith and F. N. Johnson, "The Popularity of Children's Fiction as a Function of Reading Ease and Related Factors," The Journal of Educational Research 65 (May–June 1972): 397.

[2] Klare, Readability, p. 30.

With the publication of the McGuffey Readers about 1840, the public was introduced to a graded vocabulary approach to reading skill development.

It was not until 1921, when E. L. Thorndike published The Teacher's Word Book that the way was paved for Lively and Pressey in 1923 to develop what is usually considered the first readability formula. As a spin-off from a brief study of the number of technical words in a junior high science textbook, Lively and Pressey decided to develop a procedure for measuring the vocabulary of supplementary reading material. The method they developed utilized one-thousand word samplings and summarized the number of different words in the sample, the number of words not in Thorndike's list of the 10,000 most common words, and the weighted median Thorndike "Word Book" index number.[3]

As a result of a study of sixteen types of reading matter from second grade readers to medical school physiology, the authors became aware of the possibilities for investigating the distribution of vocabulary burden throughout the text. The authors found the range of vocabulary in the second grade readers to be small. However, the range in Stevenson's Kidnapped was also small, and thus they suggested that it might be used for supplementary reading at the fourth or

[3]Bertha A. Lively and S. L. Pressey, "A Method for Measuring the "Vocabulary Burden" of Textbooks," Educational Administration and Supervision 9 (October 1923): 398.

fifth grade level.[4]

The use of formulas in the preparation of graded book lists is not new. Librarians should note the historic interest of the American Library Association in the readability of books, evidenced in their cooperation with Washburne and Vogel in a study reported in 1928 of "what books fit what children."[5] A graded trade book list was prepared, based on both the 36,750 children's reported evaluation of 800 books and each child's own Stanford silent reading test score. Lively and Pressey's formula was applied to these books, providing a validation study.

As a result of this study, Washburne and Vogel in 1928 constructed their own readability formula in which grade index was estimated on the basis of different words per thousand, the number of words not on Thorndike's list of 10,000, number of simple sentences in seventy-five successive sections, and the total number of prepositions in 1,000 words.[6]

As pointed out by Lorge, the usefulness of such statistically derived formulas requires that the user understand that a readability formula can be applied only to books like

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[4]Ibid., p. 394.

[5]Carleton Washburne and Mabel Vogel, "What Books Fit What Children," School and Society 23 (January 2, 1926): 22.

[6]Mabel Vogel and Carleton Washburne, "An Objective Method of Determining the Grade Placement of Children's Reading Material," Elementary School Journal 28 (January 1928): 380.

those evaluated during its development.[7] With this fact in
mind, Washburne and Vogel asserted that the formula could be
used to determine the grade placement of any elementary book
if difficulty is the factor under appraisal.

Washburne and Vogel continued their formula research,
and ten years later reported that they had broadened the base
to include primary grade books and thus arrived at a more
useful formula. In cooperation with librarians from the
American Library Association, the formula was used in grading
the books in the 1936 supplement to The Right Book for the
Right Child. Washburne and Vogel felt that by selecting
books on the basis of the wide experience of children's
librarians and grading them on the basis of careful statisti-
cal research, teachers and librarians could choose books
suitable for the children's varying levels of ability.[8]

The word lists of Dolch[9] and of Dale[10] were first
developed in the period before 1934. Though later revised,
they have been used in a number of readability studies and
formulas since that time.

[7]Irving Lorge, "Readability Formulae--An Evaluation,"
Elementary English 26 (February 1949): 87.

[8]Carleton Washburne and Mabel Vogel Morphett, "Grade
Placement of Children's Books," The Elementary School Journal
38 (January 1938): 364.

[9]Edward William Dolch, Problems in Reading (Champaign:
Garrard Press, 1948), pp. 99-100.

[10]Edgar Dale, "A Comparison of Two Word Lists," Educa-
tional Research Bulletin 10 (December 9, 1931): 484-87.

Dale's list of 769 words was used in the work of Gray and Leary, which is typical of the 1934-38 period of detailed formula development. Gray and Leary sought the help of librarians, publishers and educators in determining the factors that influence readability for adults with limited education. Eight elements were isolated upon which a prediction of the difficulty of a book could be experimentally determined—number of different hard words, number of easy words, percentage of monosyllables, percentage of personal pronouns, average sentence length in words, percentage of different words, number of prepositional phrases, and percentage of simple sentences.[11]

Later Kessler utilized the Gray-Leary readability study to isolate elements to use in analyzing thirty-five high school biology texts. He found that the majority of the books were of average difficulty, thus suitable for most tenth grade students. His difficulty ratings compared favorably with the recommendations of the Standard Catalog for High School Librarians.[12]

Following Kessler's formula came the Flesch and Dale-Chall formulas, primarily intended for adult material. Though among the best known, most-used and most precise in

[11]Gray, "Readable," p. 410.

[12]Edward Kessler, "The Readability of Selected Contemporary Books for Leisure Reading in High School Biology," Science Education 25 (October 1941): 264.

readability history, they were ignored in this resume in favor of two formulas for children which appeared in 1948.

Dolch's formula evidenced the attempts at simplification typical of the 1938-53 period. Dolch tentatively studied a number of elements of reading difficulty, and finally decided to concentrate intensively on two--sentence length and word difficulty. Based on research with ten reader series in which Dolch noted a steady progression in the "counts" used in the formula, he outlined a procedure that a user could apply quite easily. A sentence or two from each page provided the sample, to avoid a change of difficulty from one section of the text to another. The upper ten percent in sentence length and words not on the Dolch list of the first 1,000 Words in Children's Reading were used in the computation.[13]

Lester and Viola Wheeler developed a simple technique to evaluate children's material and determine an independent reading grade level. Depending on the length of the book, the user tabulated 1,000 words from samples at five or ten page intervals. Grade placement of the tabulated words was then determined, using the Thorndike Wordbook of Twenty Thousand Words. With a grade value for each word, the final step was to figure the percentage of words at each grade level. For independent reading, they chose the level at which

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[13]Dolch, Problems, pp. 253-54.

the child knew ninety-five percent of the words. The sim-
plicity of this procedure was obvious.[14] However, Klare
noted that no criterion other than the Thorndike word count
was used to evaluate the validity of the technique.[15]

Readability Formulas Used in the Current Study

One effort at specialization after 1953 was the
development of additional formulas for primary reading
materials. Two of these, the Wheeler-Smith and Spache For-
mulas, were used in the present study. The third formula
used herein was the Fry Formula, a recent attempt at simplic-
ity for a wider grade range than the previous two.

Mary Gaver, Library Science Professor at Rutgers,
recommends the use of the Fry Readability Graph by librarians
who need as precise guidance as possible in working with
elementary school readers.[16] She stated that Dr. Fry's
graduate students are enthusiastic about it because of its
ease in use and high reliability. She reported using it in
her work as editor of The Elementary School Library Collection
whenever she was in doubt about a book's reading level because
she found her subjective judgment was often not reliable when
checked against the readability formula score.

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[14]Lester R. Wheeler and Viola D. Wheeler, "Selecting
Appropriate Reading Materials," Elementary English 25 (December
1948): 484-85.

[15]Klare, Measurement, p. 62.

[16]Mary V. Gaver, "A Readability Graph for Librarians,
Part II," School Libraries 19 (Fall 1969): 23.

Klare recommended that when only children's material
is to be analyzed (as in the easy-to-read series), a formula
prepared specifically for that level is often advantageous.
For the lowest level, he suggested that Spache's formula is
applicable for grades one to three, and the Wheeler-Smith
formula covers the primer to fourth grade level.[17]

The Wheeler-Smith Formula

When Wheeler and Smith reported on their formula in
1954, they justified its construction on the need for a simple
formula for determining readability of primary materials.
They were impressed with the ease with which the Flesh For-
mula could be applied, but it was limited to upper grade
usage. They based their use of polysyllabic word count upon
the research findings published by Johnson in 1930. Johnson
presented data collected on series of readers, geography,
and language books for primer through grade VIII which served
to suggest tentative norms in percentage of polysyllabic words
in the various grades.[18]

To set up a criterion measure for each level, Wheeler
and Smith took a random word count of nine reading series.
They determined both the mean percentage of polysyllabic words
and the mean unit length for each level. The combined means

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[17]Klare, Measurement, p. 24.

[18]George R. Johnson, "An Objective Method of Deter-
mining Reading Difficulty," Journal of Educational Research 21
(April 1930): 286.

formed the criterion. They were aware that critics might argue that giving equal weight to unit length was perhaps over weighing a factor generally considered less important than vocabulary. However, they felt justified, as in every case they reported a clearcut increase in sentence length from grade to grade for every case in the nine series.[19]

They warned, however, that "all readability formulas tend to give the instructional level and when books are assigned for independent reading, these books should be at least one level below the level indicated by the formula."[20]

The Spache Formula

Development of the formula

In developing his 1953 readability formula for evaluating primary level reading materials, Spache selected the elements of sentence length and proportion of hard words as most indicative of the reading difficulty on that level. One hundred fifty-two textbooks were sampled, including one hundred twenty-nine readers from pre-primer through third grade and the remainder from social science, health, and science texts. Publisher grade level designations were assigned each of the books. After the sentence length and hard word data were collected, the elements of reading difficulty were then intercorrelated with each other and with the grade level designations.

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[19]Wheeler, "Practical Readability Formula," p. 398.

[20]Ibid.

The multiple correlation coefficient derived by combining sentence length and percent of hard words for predicting grade level was .818. "The complete formula is Grade level = .141 average sentence length per 100 words + .086 percent hard words + .839."[21]

Spache asserted that the formula can be used to evaluate trade books, textbooks, readers, and reference books purported for the primary level. Thus, these readability formulas served well the needs of this study of easy-to-read materials for the primary reader in spite of their recognized limitations.

When the formula was first devised, the Dale Word list was used. In 1956 Stone suggested that changes in 173 of the words would update the list.[22] Spache compared the grade level estimates derived by using each of the lists for twenty-five primary books from the first to third grade level. Differences in reading level estimates averaged less than two months, so the Stone revision is now recommended for use with the formula.[23]

Research using the formula

A number of studies have been conducted using the Spache Formula. Staiger scaled eighteen selections from basal

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[21]Spache, Good Reading, p. 196.

[22]Charles R. Stone, "Measuring Difficulty of Primary Reading Material: A Constructive Criticism of Spache's Measure," Elementary School Journal 57 (October 1956): 37.

[23]Spache, Good Reading, p. 198.

readers according to difficulty through the use of the Word

Error Quotients made by the third-grade children in oral

reading at sight of the selections.[24] Spache reported that

after the Staiger study was completed, the rankings were

compared with those obtained by the Spache Formula. A rank

order correlation of .70 was found between the two scalings,

thus implying a relationship between formula estimates and

pupil reading performance.[25]

Turner used both the Spache and Yoakam formulas to

obtain the readability level for three second grade social

studies texts. On the basis of this small sample, Turner

concluded, "It would appear that readability formulas have

become sufficiently accurate for estimating the comparative

readability of primary grade materials."[26]

The Fry Formula

Development of the formula

Users of the 1968 Fry formula obtain the grade level

estimate by determining the number of sentences and the

average number of syllables per 100 words. These are plotted

on the readability graph. The formula was first developed

[24]Ralph E. Staiger, "Certain Language Factors in the
Readability of Primary Reading Textbooks," Journal of Educa-
tional Research 48 (April 1955): 595.

[25]Spache, Good Reading, p. 196.

[26]Devonne Gae Turner, The Readability of Selected
Second Grade Social Studies Textbooks (Bethesda, Md.: ERIC
Document Reproduction Service, ED027968, 1968), p. 30.

when Fry was in Uganda. He found simplicity of prime impor-
tance, and rationalized that the fact that it was originally
partially geared to an African set of readers may have caused
it to gain greatest acceptance in emerging nations.[27]

In answer to the question of how he obtained his
grade-level designations, he noted,

> I simply plotted many books which publishers said
> were third-grade readers, fifth-grade readers, etc. I
> then looked for clusters and "smoothed out the curve."
> After some use and correlational studies, the grade-
> level areas were adjusted.[28]

Research using the formula

Fry reported that the readability graph ranks books
about as well as the Dale-Chall, Flesch, and SRA formulas on
a hard-to-easy continuum and also gives approximately the
same grade levels. He based this statement upon the findings
of one of his advisees at Rutgers, Andrew Kistulentz, who
used ten trade books in his tenth grade English classes. His
findings resulted from rank order correlations between read-
ability formulas and constructed comprehension tests. The
analysis of intercorrelations revealed a .94 between the Dale-
Chall and Fry Formula, a .96 with the Flesch, .98 with the
SRA, .93 with the student comprehension test, and .78 with
the Botel.[29]

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[27]Edward B. Fry, Reading Instruction for Classroom and
Clinic (New York: McGraw-Hill Book Co., 1972), p. 245.

[28]Ibid.

[29]Ibid., p. 235.

Fry also reported a validation study of his formula conducted at the primary level in which he compared the mean readability grade level scores on the Spache and Fry Formulas, cloze error, and oral reading error scores by thirty students on seven books.

In analyzing the findings he stated,

> The Readability Graph ranked the passages quite well and yielded about the same grade level scores as the Spache formula . . . It is interesting to note that both the Spache formula and the Readability Graph correlate about as well with the cloze passages. In studying the data the author found that the Spache formula gained some consistency by making finer distinctions among the first three books but lost some by misplacing one book.[30]

Fry criticized the Spache formula as a result of this seven book study. He observed:

> The Spache formula ranked the passages fairly well, but it did have some faults. It reported a readability level for Charlie and the Chocolate Factory which was inconsistent with the results of the other three methods. It also reported a readability level of 4.2 for Orlando, the Brave Vulture, a point beyond the formula's range so another formula (Flesch) had to be used to determine grade level.

> Hence, one difficulty is that the Spache formula cannot rank books above about 4.0 while the Flesch, Dale-Chall and others cannot rank books below 4.0. Those using these formulas in mid-elementary levels must use one formula for the upper level and another for the lower level, sometimes without good articulation.[31]

Spache countered the Fry article with the observation that seven books was a rather superficial sample on which to

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[30]Edward B. Fry, "A Readability Graph Validated at Primary Levels," The Reading Teacher 22 (March 1969): 538.

[31]Ibid., p. 537.

base his analysis. Spache outlined his objections to adapting

Fry's method in place of the Spache formula. He felt the Fry

formula with its full grade level estimates yielded estimates

too gross for primary grade book selection. While Fry main-

tained his formula was accurate within about one grade level,

the probable error of the Spache formula in predicting a book's

grade level is 3.3 months. Thus, half of the Spache esti-

mates will not vary from the true level by more than three

months.

Spache pointed out that the syllable count demanded

in the Fry formula, if done accurately, is less simple than

the Spache formula method of checking for the hard words not

included in a word list.[32]

Comparison of Formulas

Gilbert used both the Spache and Fry Formula in his

examination of the readability level of science texts.[33]

Ten basic science series were evaluated. The Fry and Spache

Formulas were applied to the primary grade material and the

Dale-Chall, Lorge and Fry Formulas were used for the inter-

mediate group. Results of the study indicated that no highly

correlated relationship existed among the various readability

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[32]Spache, Good Reading, p. 207.

[33]Charles D. Gilbert, An Examination of Readability
Levels for Selected Basic Science Texts (Bethesda, Md.: ERIC
Document Reproduction Service, ED059860, 1972), p. 14.

formulas when applied to the grade level determined by the publishers.

Rakes appraised the readability of materials for the Adult Basic Education classes by using the Dale-Chall, Fry, and Gunning-Fog Readability Formulas. He found no evidence that a particular readability formula was preferable when publishers' ratings were the basis for comparison. Thus the selection of a particular formula to use might be considered personal choice rather than empirical justification. However, there was an indication that the use of a readability formula as well as reader preference and teacher approximation would be useful in selecting materials for students.[34]

Driver sought to determine the intercorrelations among the Dale-Chall, the Fry and the SMOG Formula when applied to seven science text series. Significant relationships beyond the .01 level of significance were found between each of the formulas and the publishers' designated grade levels. The validity of the recently devised Fry and SMOG formulas was established by the high correlation coefficients with the older Dale-Chall formula. Within the limitations of the study, Driver concluded that the most important advantage of the Fry and SMOG Formulas was that they test vocabulary by polysyllabic count and thus do not depend on word familiarity.

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[34]Thomas A. Rakes, A Readability Analysis of Reading Material Used in Adult Basic Education (Bethesda, Md.: ERIC Document Reproduction Service, ED067627, 1972), p. 58.

Hence all types of material are tested indiscriminately.[35]

Studies of Readability

Many studies have been done which employ formulas
to de ermine the readability of textbooks for a given grade
le i. A number of these studies involve the use of the Fry
and Sp che Formulas.

Arnsdorf analyzed twenty-five books from four basal
social studies series to determine the readability level
within and between books.[36] He applied the Spache Formula
to the primary texts and the Dale-Chall Formula to the inter-
mediate texts. Differences between the reading levels
indicated by the formula estimates from primary to interme-
diate were large, ranging from 1.35 to 2.16. Although this
finding indicated the need for attention to the continuity
of the series, it was impossible to determine to what extent
the separation was accounted for by the application of dif-
ferent formulas at the primary and intermediate levels.

Johnson evaluated the readability of forty-one social
studies texts adopted in Florida for grades one through six,
using the Fry and Spache Formulas for the primary level and

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[35]Jean Ricks Driver, "The Intercorrelations Among
Three Readability Formulas When Applied to Selected Fourth,
Fifth and Sixth Grade Science Textbooks," (Ed.D. dissertation,
Northwestern State University of Louisiana, 1971), p. 66.

[36]Val E. Arnsdorf, "Readability of Basal Social Studies
Materials," The Reading Teacher 16 (January 1963): 245.

the Dale-Chall, Flesch, and Fry Formulas for the intermediate levels. All forty-one textbooks were found to have reading levels at or above their intended grade level. One-half of the readability levels obtained by the Fry and Spache Formulas for the primary texts were above the grade levels suggested by the publishers and none were below. The readability levels of samples within texts showed a variation of as much as three years. In general, the readability levels determined by the Spache Formula were closer to the readability levels suggested by the publishers than those indicated by the Fry Formula.[37]

In a science textbook readability study by Newport, he used the Spache Formula for the primary levels.[38] With the exception of most of the grade one textbooks, the readability levels were within a desirable range. In like manner, Denslow found that according to the Spache Formula, the upper limits of the range of three of the eight first grade science textbooks thus evaluated reach the 2.1 level.[39]

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[37]Roger E. Johnson, How Readable Are Our Elementary Social Studies Textbooks? (Bethesda, Md.: ERIC Document Reproduction Service, ED043459, 1970), p. 6.

[38]John Newport, "Readability of Science Textbooks in the Elementary School," The Elementary School Journal 66 (October 1965): 43.

[39]Orriene D. Denslow, "Vocabulary and Sentence Study of Eight First Grade Science Books," Elementary English 38 (November 1961): 489.

Causey, in a comparative study of the reading diffi-
culty of two series of fourth, fifth, and sixth grade social
studies texts and the McGuffey readers applied four readabil-
ity formulas to each of the readers and textbooks. His
findings indicated that modern textbooks are more exact with
respect to readability than the earlier readers. The McGuffey
readers, however, demonstrated more consistency in a gradual
rise in difficulty than the present day texts.

Results of his study also indicated a high correla-
tion between the Fry and the Dale-Chall, Flesch and Lorge
Formulas. The complete results of the research indicated
that the Fry Formula measured difficulty as effectively as
the Flesch, Dale-Chall and Lorge Formulas.[40]

Jongsma used five readability formulas--the Dale-
Chall, Flesch, Fry, Gunning's Fog Index, and McLaughlin's
Smog Formula--to provide quantifiable estimates of the diffi-
culty level of twelve Newbery Winners.[41] As the last three
formulas were recent efforts to develop quicker, easier, and
more usable modes of measurement, an indirect goal of the
study was to observe variation between formulas in rating the
same book. One hundred librarians were also sent question-
naires requesting a grade level be assigned each book. Only

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[40]Clarence Richard Causey, Jr., "A Comparative Study
of the Reading Difficulty of Selected Social Studies Textbooks
and the McGuffey Eclectic Readers," (Ed.D. dissertation,
Auburn University, 1971), p. 75.

[41]Eugene A. Jongsma, "The Difficulty of Children's
Books: Librarians' Judgments Versus Formula Estimates,"
Elementary English 49 (January 1972): 20.

fifty-three questionnaires were returned, and nine of those were too incomplete to process.

Judgments of these forty-four librarians of the difficulty of a single book varied from three to as much as nine grade levels. An analysis of the ratings derived by the formulas demonstrated that the variability between formulas was much less than that between librarians. For a single title, formula estimates seldom differed more than two or more grade levels.

Jongsma notes, "A certain amount of variation is to be expected, since most of the formulas consider different elements. For example, in counting the number of syllables, the Fry Formula omits proper nouns while the Flesch Formula counts all words."[42]

The mean of the librarian estimates approximated the formula results closely, seldom varying by even one grade level. One might thus conclude that the use of a formula serves a librarian in a similar way to that of seeking the views of a number of co-workers in making a grade level determination.

Only two studies were found which attempted to estimate the readability of trade books for beginning readers. Both used only the Spache Formula.

Condit in 1959 requested lists from sixty-one editors of general trade books which they felt suitable for

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[42]Ibid., p. 25.

independent reading by first and second graders.[43] Librar-
ians' lists, professional literature, and public library
collections were also searched to provide additional titles.
A total of 759 proposed titles were evaluated and reduced to
246 titles which graded 1.0 to 3.3, using the Spache Formula.

These were then rated by ninety-nine first and second
grade children. Each book was read an average of five times.
The comments of the children and the librarians were used in
the development of a final bibliography. Condit found that
only five percent of the total titles could be read by even
the superior first grade reader, and only seventy-one percent
were suitable for a superior second grade reader. Condit's
study reinforced the need for fine trade books written for
the beginning independent reader.

The 1961 Russell study of ten easy-to-read trade
books for children that was described in Chapter I was the
only research available that attempted to establish the read-
ability of books from easy-to-read series. Made at the begin-
ning of the easy-to-read popularity and limited in scope,
Russell still felt the evidence was clear that trade books
labeled "easy-to-read" vary considerably in difficulty. The
negative comments of children concerning the books were
largely concerned with the difficulty of the materials. The
favorable comments related to amusing incidents.[44]

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[43]Martha Olson Condit, "Trade Books for Beginning
Readers," _Wilson Library Bulletin_ 34 (December 1959): 284-85.

[44]Russell, "Evaluation," p. 381.

A thorough search of the literature, including the reports of research, did not reveal that the easy-to-read trade book series have been analyzed to determine their readability level. Spache's chapter on series books in Good Reading for Poor Readers mentioned many series alphabetically, but his brief annotation included only a generalized grading for the series as a whole.[45]

Gateways to Readable Books, a listing designed for adolescents who have reading difficulty, also included a "Books in series" chapter with a grade level for such series as a whole. The compilers in their statement of the procedures used in building the bibliography stated that they derived the estimated grade level of difficulty from ". . . estimates given by various catalogs and books; from calculations of a reading index representing the structural difficulty of a limited number of titles according to readability formulas; and from the judgment of experienced persons who worked on the list."[46]

In the appendixes of the 1972 edition of The Elementary School Library Collection, the alphabetical author listing of general trade books for independent reading in the first and second grades included many titles from easy-to-read series. Although Gaver recommended the use of the Fry

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[45]Spache, Good Reading, pp. 138-50.

[46]Ruth Strang, Ethlyne Phelps, and Dorotʰy Withrow, Gateways to Readable Books 4th ed. (New York: H. W. Wilson, 1966), p. 18.

Formula, she indicated the selector for this general listing

used the Spache Formula because it makes finer distinctions

than the Fry Formula does.[47]

Chall pointed out the need for studies comparing the

grade-placement indexes of the most widely used formulas on

the same material.[48]   However, this investigator could find

no evidence that the correlation of the Fry Readability

Formula with both the Spache and Wheeler-Smith formulas has

been determined.

Summary

Educators have been concerned with readability for

many years. However, Lively and Pressey introduced what is

usually considered the first readability formula only fifty

years ago. A year later the American Library Association

evidenced their interest in readability by cooperating with

Washburne and Vogel in the preparation of a graded book list,

based on both children's evaluations and each child's own

Stanford silent reading test scores. The Lively and Pressey

formula was applied to these books, providing a validation

study.

Washburne and Vogel developed their own formula, and

again with the aid of the American Library Association,

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[47]Mary V. Gaver, ed., The Elementary School Library Collection 7th ed. (Newark: Bro-Dart Foundation, 1972), p. viii.

[48]Chall, Readability, p. 165.

developed a graded book list based on the librarian judgment
and formula analysis.

After 1938 formula developers sought simplification
through a reduction in the number of factors in reading
difficulty upon which the formula was based. Two elements
became commonly accepted as most important--sentence length
and word difficulty.

Since 1953 efforts to develop specialized formulas
have resulted in two specifically designed for the primary
grades. Both were used in the present study. A number of
studies evidenced acceptance of the use of the Spache Formula
for readability estimation. No studies were found in which
the Wheeler-Smith Formula was used for readability measure-
ment. However, Klare suggested its use in determining the
lowest readability levels for children's books.[49] The Fry
Formula was the most recently developed and covers a wider
grade range than the other two.

A scarcity of current research in the readability of
primary level trade books was apparent. Only two studies
were found in which the readability of trade books for
beginning readers was estimated. Both were over ten years
ago before the wide publication of easy-to-read trade book
series for children. Both involved only the use of the
Spache Formula. Little effort has been made to determine if

[49]Klare, Measurement, p. 24.

significant relationships exist between the formulas usable for estimating the readability level of primary materials. Therefore, the research described in the following chapter was planned and conducted.

CHAPTER III

DESIGN OF THE STUDY

The purpose of this study was to make research information on the readability of the easy-to-read series available for teachers and librarians responsible for the selection of trade books for beginning readers. Because the Children's Catalog is a basic selection aid, an evaluation of the primary level grading in the 1971 Children's Catalog for the easy-to-read series was made through the application of three readability formulas. The correlation among the three readability formulas when applied to the selected trade books was also considered to determine the extent of relationship between the readability level estimates.

Selection of Trade Books

The seventy-nine trade books from easy-to-read series which received a primary grade level designation in the Children's Catalog were selected as the source of the data.

These books included one or more titles from the See and Read Beginning to Read Books, Beginning Science Books, Beginning-to-Read Books, Read-Alone Books, Beginner Books, Bright and Early Books, Read-by-Yourself Books, Early I Can

Read Books, and I Can Read Books. These books are 64 pages
or less in length and are graded K-2, K-3, 1-3, 2-4, or E
in the Children's Catalog. Five Easy-to-Read Science Books
published by Random House were omitted from the study because
they were not assigned a primary grade level designation in
the Children's Catalog. In addition, they extended beyond
the upper limits of the Spache and Wheeler-Smith formulas.

Instrumentation

Selection of Formulas

For more significant results, three readability
formulas were selected for use in the study. The Spache,
Wheeler-Smith, and Fry Formulas were chosen because all three
were usable for the primary level. In the preparation of
each formula, the criterion measure used was the publishers'
grade designations for basic reading series. Because this
study was concerned with trade books used to supplement
primary grade readers, these formulas were deemed appropriate.

Correlations among the three formulas were made in
an attempt to add validity to the Fry and Wheeler-Smith find-
ings when the strength of relationship was compared with the
Spache Formula. One hundred fifty-two textbooks were analyzed
by Spache in his formula preparation, and since its publica-
tion in 1953, several comparative studies have been conducted
which support its use for readability measurement.

All three formulas employ the elements of sentence
length and proportion of hard words as the best indicators of

reading difficulty. However, Spache Formula "hard words" are determined by absence from a vocabulary list while the Wheeler-Smith and Fry Formulas use a mode of syllable measure. Thus, if the scores from the Wheeler-Smith and Fry Formulas were assessed as consistent with the results from the Spache Formula, the users could select the formula they deemed easiest to apply.

Directions for Using Formulas

The directions for applying each of the three formulas were as follows:

The Fry Formula

To apply the Fry Formula,[1] count the total number of sentences in each hundred word sample, omitting all proper nouns. Estimate to the nearest tenth of a sentence. Average these numbers. Count the total number of syllables for each hundred word sample and average the samples.

Plot on the Readability Graph the average number of sentences per one hundred words and the average number of syllables per hundred words. A copy of the graph was included in Appendix A.

Because the Fry Graph does not designate levels below grade one, the Maginnis extension through preprimer level was used when required. In the preparation of this extension,

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[1]Fry, Reading Instruction, p. 231.

Maginnis plotted primers, preprimers and first grade readers of five sets of basal readers.[2] Maginnis stated, "Fortunately the books at each of these levels fell into mutually exclusive clusters which were easily separated by lines."[3] A copy of the Fry Readability Graph extended through preprimer level was included in Appendix B.

The Spache Formula

To determine the readability of each easy-to-read book, the Spache formula that grade level = .141 average sentence length per 100 words + .086 hard words (outside the Stone revision of the Dale "Easy Word List" of 769 words) + .839 was applied.[4] The sum represented the estimated reading difficulty of the selection. Rounded off to the nearest tenth, the figure designated a book estimated to be equal to readers used for that grade and month in school. For example, 3.9 indicated the ninth month of grade three.

When the number of sentences and hard words were applicable, the Clymer tables were used to reduce the amount of computations necessary to complete the formula. Spache gave the following directions for using the tables:

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[2]George H. Maginnis, "The Readability Graph and Informal Reading Inventories," The Reading Teacher 22 (March 1969: 559.

[3]Ibid., p. 51.

[4]Spache, Good Reading, p. 196.

. . . enter the total number of words in the sample, and the number of sentences. With these two facts, use Table I and write down the figure obtained opposite item 6 in the work sheet. Then find the number of hard words not present in the Word List. With this number and the number of the words in the sample enter Table II. Write the figure found in the Worksheet opposite item 7. Add the numbers opposite item 6 and 7 to obtain the readability estimate. Do not add the constant in item 8, for this is already included in the figures you have found. Round off the sum of 6 and 7 to the nearest month.[5]

The steps outlined by Spache for applying the formula were listed in Appendix C, Stone's revision of the Dale "Easy Word List" in Appendix D, and Clymer's tables for rapid computation in Appendix E.

The Wheeler-Smith Formula

Eight steps were involved in the application of the Wheeler-Smith formula.

1. Take a random sample of ten to twenty pages of the book.

2. Count the number of words in the sample.

3. Count the number of units in the sample. Count as units sections ending in question marks, periods, exclamation points, colons, semicolons or dashes. In counting a unit of conversation include the 'said John, he asked,' etc. as part of the unit.

4. Count the number of polysyllabic words in the sample.

5. Divide the number of words in the sample by the number of units. This will give you the average unit length.

6. Divide the number of polysyllabic words in the sample by the number of words in the sample. This will give you the percentage of polysyllabic words.

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[5]Ibid., p. 206.

7. Multiply the average unit length by the percentage of polysyllabic words. (Don't forget the decimal point!) Multiply this score by ten.

8. Take the figure obtained in step 7 and go to the table for grade placement.

Table of Norms

Primer	4.0 to 8.0
First Reader	8.1 to 11.5
Second Reader	11.6 to 19
Third Reader	19.1 to 26.5
Fourth Reader	26.6 to 34.5[6]

Application of Formulas to Individual Books

The three formulas were each applied to the complete text of each book. Each formula designated a specific number of pages or words to be used in a single sample, and as many separate samples were taken as the length of the text allowed. From the average of the subscores, a mean readability level was established. Clymer, in his study of the sampling reliability of the Spache Formula, observed that the most direct way of obtaining the true readability of a book was to apply the formula to the entire contents of the book.[7] Based on his analysis of various sampling techniques used on six primary science texts, he concluded that for other primary books of similar length, three samples will give a readability

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[6]Wheeler, "Practical," p. 398.

[7]Theodore Clymer, "A Study of the Sampling Reliability of the Spache Readability Formula," Reading in a Changing Society. Proceedings of the International Reading Association Conference Vol. 4 (Toronto, Canada: n.p., 1959), p. 246.

estimate precise enough for most users. Twelve to fifteen samples may be needed for very careful evaluation.[8] Since over fifty of the books in the present study required no more than fifteen samples to apply each formula to the entire text, the formulas were thus applied to achieve the most precise estimate possible. A copy of the worksheet used in computing and recording the Fry Formula was given in Appendix F, the Spache Formula worksheet in Appendix G, and the Wheeler-Smith worksheet in Appendix H.

For computational purposes, all grade level estimates of Primer or below derived by applying the Wheeler-Smith Formula or the Maginnis extension of the Fry Formula were assigned a 1.0 grading. Grade one was assigned a 1.5 designation, grade two, a 2.5, and all succeeding grades a similar .5 midpoint.

A 1.0 designation was assigned as the grade level for books classed as K by the Children's Catalog whenever a numerical level was needed for comparative purpose. As in the formula determinations, upper ranges became 1.5, 2.5, 3.5, and 4.5. The E grading was designated 1.0-2.5 as a result of grade level indication for that section, quoted in Chapter I.

Treatment of the Data

The data obtained by the application of the three readability formulas to each of the seventy-nine books was

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[8]Ibid., p. 249.

tabulated and reported as (1) number and percent of total books readable at each grade level, based on mean, (2) number and percent of total books readable at each grade level, based on maximum limit of subscores, (3) comparison of Children's Catalog grade level with book mean, (4) comparison of Children's Catalog grade level with maximum subscores for each book, (5) number and percent of total books in which the range of subscores is within specified limits, (6) comparison between initial subscore and subsequent subscores, (7) highest and lowest mean in accordance with publisher's series, (8) highest and lowest subscore in accordance with publisher's series, (9) amount of relationship and amount of explained variance between the three readability formula combinations, and (10) the mean readability level, first sample subscore, range limits, range, and Children's Catalog grading for each book.

Summary of Procedure

The Fry, Spache, and Wheeler-Smith Formulas were applied to the seventy-nine trade books from easy-to-read series which received a primary grade level designation in the Children's Catalog in an effort to determine the readability of each book.

Directions were followed for the application of each formula, and as many samples were taken as the length of the text allowed. Headings or captions for illustrations were not included as part of the continuous text.

In the application of the Fry Formula, the Maginnis graph extension through the preprimer level was used when required for plotting. All scores in the Wheeler-Smith Formula or Fry Formula extension which were below primer level were recorded as P and given a 1.0 designation for comparative purposes.

For both the Wheeler-Smith and Fry Formulas, grade one was designated 1.5, and the succeeding grades were given a midpoint level. The same determinations were given the Children's Catalog grading. E was assessed a 1.0 to 2.5 grading for tabular comparisons. The Children's Catalog K level also was assigned the 1.0 grade level.

CHAPTER IV

ANALYSIS OF THE DATA

The data were analyzed in three ways in order to relate directly to the three questions raised in presenting the problem of the research. They were arranged in tabular form and appropriate interpretations were made. Table 12, found in Appendix I, was prepared to include the composite data found by applying the three formulas to each of the seventy-nine books. The other summary tables were based on the data presented in table 12.

Readability Determined By Formula Application

One aspect of the problem related to the extent to which the seventy-nine easy-to-read books recommended by the Children's Catalog were readable for first, second, and third graders, as indicated by both the mean and the upper limit of the subscores of the Fry, Spache, and Wheeler-Smith Formula readability level estimates.

Table 1 showed the number and percent of books readable at each grade level, based on the mean level determined by each formula.

TABLE 1

NUMBER AND PERCENT OF TOTAL BOOKS READABLE
AT EACH GRADE LEVEL, BASED ON MEAN*

	Fry		Spache		Wheeler–Smith	
	No.	%	No.	%	No.	%
Below First	11	13.9	1	1.3	18	22.8
First	58	73.4	7	8.9	30	38.0
Second	76	96.2	68	86.1	71	89.9
Third	79	100	79	100	79	100

*Totals after first grade are cumulative and therefore include all previous numbers.

When mean readability level was considered, the grade level designations determined by applying the Spache Formula were higher than those for the other two. In general, the Wheeler–Smith Formula ranked the books more difficult than the Fry Formula. The Fry Formula showed the majority of the books readable for the first grade level. However, in both the Wheeler–Smith and Spache Formula determination, the majority of the books were found to be second grade level, with ten percent readable only by third grade levels.

As noted in Chapter II, Wheeler and Smith generalized that books for independent reading should be at least one level below that indicated by a formula. Thus, their formula would deem thirty-eight percent to be usable for independent reading on the second grade level, and ten percent to be appropriate for independent reading at the fourth grade level.

This rule applied to the Fry Formula showed seventy-three
percent suitable for second grade independent reading and
four percent at the fourth grade level.

Table 2 indicated the number and percent of the
seventy-nine books that are readable at each grade level,
based on the maximum limit of the subscores. The maximum
limit of the subscores may be considered a better criterion
than the mean score for primary readability determination.
It is doubtful if one is justified in rating a primary level
independent reading book easier than its most difficult
portion.

TABLE 2

NUMBER AND PERCENT OF TOTAL BOOKS READABLE
AT EACH GRADE LEVEL, BASED ON
MAXIMUM LIMIT OF SUBSCORES

Grade Level*	Fry No.	%	Spache No.	%	Wheeler-Smith No.	%
1st	27	34.2	3	3.8	26	32.9
2nd	50	63.3	34	43.0	68	86.1
3rd	67	84.8	75	94.9	78	98.7
4th	72	91.1	78	98.7	79	100
5th	76	96.2				
6th	78	98.7	79	100		
7th	79	100				

*Totals after 1st grade are cumulative and therefore
include all previous numbers.

All but three of the books were found to be second
level when the means of the Fry Formula scores were considered

(table 1). Yet, when maximum subscore becomes the judgment standard, it was the fifth level before that statement was possible (table 2). The Fry Formula subscores indicated only sixty-three percent readable on the second grade level.

The Spache Formula maximum subscores did not show the majority of the books to be readable on the second grade level, as indicated when the mean was the reference point. Forty-three percent showed a maximum subscore readability level of second grade.

Very little difference between the mean and maximum subscore readability levels was evidenced by the Wheeler-Smith Formula. This is understandable when one recalls that each sampling on which the Wheeler-Smith Formula was based was ten to twenty pages in length. In all but two of the books, this meant no more than three samples for the entire book.

It is certainly questionable whether a book with a maximum subscore beyond grade three should be considered independent reading for a primary child. Each formula placed one or more in that category.

The problem of the study was also concerned with the number and percent of the cases in which the Children's Catalog grading underestimated the readability level indicated by the formula estimates, both in mean readability level estimates for each formula and in the upper limits of the subscores.

Table 3 compares the <u>Children's Catalog</u> grade level with the book mean derived by each formula. In less than eight percent of the books did any of the formulas derive a higher mean than the maximum <u>Children's Catalog</u> level, and in no cases did that exceed one year.

When the minimum <u>Children's Catalog</u> grade level became the criterion, the readability level mean determined by the Wheeler-Smith and Spache Formulas was underestimated for sixty-one percent or more of the books. One often assumes that the lowest limit of the <u>Children's Catalog</u> grading is interest level, and thus the books would need to be read aloud at that level. In that case, the minimum level would not need to be considered in this readability study. However, a read-aloud consideration does not apply for these easy-to-read series because the sentence structure, format, and series title demonstrate read-alone design. The statement preceding the Easy section of the <u>Children's Catalog</u> also indicated that the compilers were giving them a read-alone grading, so minimum grade level should also receive consideration.

In table 4 the maximum subscore for each book was compared with the <u>Children's Catalog</u> grade level. In the case of the Wheeler-Smith Formula, the maximum subscore estimates showed only a slight change from the mean readability levels for each book. The grade designations resulting from the application of the Spache Formula showed that the

TABLE 3

COMPARISON OF CHILDREN'S CATALOG GRADE LEVEL*
WITH BOOK MEAN

	Max. Grading		Min. Grading	
	No.	%	No.	%
Fry				
Mean exceeds CC grading by two grade levels	0	0	2	2.5
Mean exceeds CC grading by one grade level	0	0	18	22.8
Mean equal to CC grading	15	19.0	59	74.7
Mean below CC grading by one grade level	53	67.1	0	0
Mean below CC grading by two grade levels	11	13.9	0	0
Spache				
Mean exceeds CC grading by two grade levels	0	0	11	13.9
Mean exceeds CC grading by one grade level	6	7.6	58	73.4
Mean equal to CC grading	52	65.8	10	12.7
Mean below CC grading by one grade level	19	24.1	0	0
Mean below CC grading by two grade levels	2	2.5	0	0
Wheeler-Smith				
Mean exceeds CC grading by two grade levels	0	0	6	7.6
Mean exceeds CC grading by one grade level	4	5.0	42	53.2
Mean equal to CC grading	34	43.1	31	39.2
Mean below CC grading by one grade level	35	44.3	0	0
Mean below CC grading by two grade levels	6	7.6	0	0

*Grade level in this table disregards range within grade, i.e., 1.0 to 1.9 is considered first level, 2.0 to 2.9 is termed second level, etc.

TABLE 4

COMPARISON OF CHILDREN'S CATALOG GRADE LEVEL*
WITH MAXIMUM SUBSCORES FOR EACH BOOK

	Max. Grading		Min. Grading	
	No.	%	No.	%
Fry				
Maximum subscore exceeds CC grading by two grade levels	9	11.3	28	35.4
Maximum subscore exceeds CC grading by one grade level	19	24.1	24	30.4
Maximum subscore equal to CC grading	19	24.1	27	34.2
Maximum subscore below CC grading by one grade level	27	34.2	0	0
Maximum subscore below CC grading by two grade levels	5	6.3	0	0
Spache				
Maximum subscore exceeds CC grading by two grade levels	4	5.0	43	54.4
Maximum subscore exceeds CC grading by one grade level	27	34.2	33	41.8
Maximum subscore equal to CC grading	32	40.5	3	3.8
Maximum subscore below CC grading by one grade level	16	20.3	0	0
Maximum subscore below CC grading by two grade levels	0	0	0	0
Wheeler-Smith				
Maximum subscore exceeds CC grading by two grade levels	0	0	9	11.3
Maximum subscore exceeds CC grading by one grade level	5	6.3	42	53.3
Maximum subscore equal to CC grading	35	44.3	28	35.4
Maximum subscore below CC grading by one grade level	33	41.8	0	0
Maximum subscore below CC grading by two grade levels	6	7.6	0	0

*Grade level in this table disregards range within grade, i.e., 1.0 to 1.9 is considered first level, 2.0 to 2.9 is termed second level, etc.

subscores exceeded the maximum Children's Catalog grading

for thirty-nine percent of the books. The Fry Formula sub-

score readability levels exceeded the Children's Catalog

maximum grading for one-third of the books.

When the minimum Children's Catalog scores become the

basis for comparison, the Spache Formula subscore readability

levels were underestimated by the Children's Catalog in ninety-

seven percent of the cases. In sixty-five percent of the

books, the Wheeler-Smith and Fry Formula subscore readability

levels were greater than the minimum Children's Catalog

grading.

Range of Readability Level Within Each Book and Series

Another aspect of the research problem was concerned

with the range of readability level within each book and

within each series as a whole.

Several approaches to this question were made in the

light of the data collected. As noted earlier, Spache

asserted that in his opinion, books whose samples vary more

than six months in the first grade and eight or more in the

second or third grades are likely to be deemed unsuitable at

the average estimate of reading difficulty.[1] Therefore,

table 5 was prepared to present the number and percent of

books in which the range of subscores was within specified

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[1]Spache, Good Reading, p. 206.

TABLE 5

NUMBER AND PERCENT OF TOTAL BOOKS IN WHICH THE RANGE
OF SUBSCORES IS WITHIN SPECIFIED LIMITS

Limits	Number***	Percent
Fry		
0 - 1*	26	33.3
1+ - 2*	24	30.8
2+ - 3*	17	21.8
3+ - 4*	4	5.2
4+*	7	8.9
Spache		
0 - 8**	21	26.9
9+**	57	73.1
Wheeler-Smith		
0 - 1*	51	65.4
1+ - 2*	27	34.6
2+ - 3*	0	0
3+ - 4*		
4+*		

*Years.
**Months.
***Number based on 78 books as one book had only one sample.

limits. A range of nine months was generalized as unsuitable at the mean level for the Spache Formula. Because the Fry and Wheeler-Smith Formulas are less discriminating, a year range was selected as a basis for their interpretation.

Inspection of table 5 revealed that in two-thirds of the books, the Fry Formula indicated a range of readability level that exceeded the suitability limits noted by Spache for accepting the average estimate of readability. One-third of the books had a range of a year or more in the Wheeler-Smith mode of readability determination. Seventy-three percent of those to which the Spache Formula was applied fell in that category.

If the books used for independent reading get substantially harder as the text progresses, they may be laid aside unfinished or cause the child frustration as he tries to complete them. This pointed out a need for tabulating a comparison between initial and subsequent subscores. This data formed the basis for table 6.

As pointed out in previous tabulations, the larger sample factor of the Wheeler-Smith Formula negates variability in the comparison between the initial subscore and the subscore range evidenced by the application of the other two formulas. Therefore, the formula lacked discriminatory power in this aspect of readability consideration. However, in thirty or more percent of the books, the Fry and Spache Formulas revealed that the lowest level was the first few pages of the book.

TABLE 6

COMPARISON BETWEEN INITIAL SUBSCORE*
AND SUBSEQUENT SUBSCORES**

Change in Reading Level	Number	Percent
Fry		
Began at lowest level	34	43.6
Increased from initial subscore by one year or more	42	53.8
Spache		
Began at lowest level	23	29.5
Increased from initial subscore by eight months or more	27	34.6
Wheeler-Smith		
Began at lowest level	59	75.6
Increased from initial subscore by one year or more	12	15.4

*Based on 78 books as one book has only one sample.
**Reported change based on one or more subsequent subscores.

In thirty-five percent of the books, the initial
subscore level increased by eight months or more in the
Spache Formula designation. In fifty-three percent of the
cases, the Fry Formula showed an increase of more than a
year in grade level. This suggests that in fifty-three
percent of the books evaluated the child who tests the first
few pages and determines he can read the book may face frus-
tration and/or lay it down before he completes it.

The easy-to-read series designation may influence
some librarians and teachers to select them for purchase and
recommend them to children for independent reading. The
fifty million copies sold by Beginner Books alone is mute
evidence of that rationale. Therefore, it was deemed impor-
tant to consider both the highest and lowest mean and the
highest subscore within each series to seek justification
for the series titles.

In table 7 the highest and lowest book mean was
recorded in each publisher's series. Table 8 shows the
highest and lowest subscore within each publisher's series.

Because some publishers had only a few series books
included in the Children's Catalog, only very general obser-
vations about table 7 were possible. It was difficult to
distinguish any specific meaning to an easy-to-read designa-
tion, however. In four of the series two formulas showed the
means to reach third grade, so the easy-to-read name certainly
does not insure readability for independent reading on the

TABLE 7

HIGHEST AND LOWEST MEAN IN ACCORDANCE
WITH PUBLISHER'S SERIES***

Series	Number of Samples	Fry	Spache	Wheeler-Smith
Follett Beginning-to-read	2	P - 1	2.2 - 2.3	P - 2
Follett Beginning Science	1	2*	2.7*	2*
Putnam See and Read Beginning to Read	2	2 - 3	2.8 - 2.9	3**
Houghton. Read by Yourself	1	1*	2.2*	2*
Random. Bright and Early	1	P*	1.0*	P*
Random Beginner Books	11	P - 1	1.7 - 2.6	P - 1
Knopf Read Alone Books	2	1 - 3	2.3 - 3.6	2 - 3
Harper. An Early I Can Read	2	P**	1.8 - 1.9	P**
Harper. An I Can Read Book	29	P - 2	1.8 - 3.1	P - 3
Harper. An I Can Read History	4	1 - 2	2.7 - 3.2	2 - 3
Harper. An I Can Read Mystery	7	1**	2.3 - 2.9	1 - 2
Harper. A Science I Can Read	14	1 - 3	2.0 - 3.1	P - 3
Harper. A Sports I Can Read	3	1**	2.1 - 2.5	P - 2

*No difference in limits due to only one mean.
**No difference in limits due to two or more equal means.
***For mathematical purposes all Primer and below scores were given a 1.0 grading.

part of the first or second grade reader.

In table 8 it can be observed that even the series with only a few books listed often showed a range of three or more years by the Fry Formula. The twenty-nine I Can Read books had a subscore range of over three years when each of the three formulas was applied. One can only reiterate the question, "Easy to read for whom?"

<div align="center">

Correlational Analyses of the Three
Readability Formulas

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Lastly, the study sought to determine if significant relationships existed between the Fry and Spache Formulas, between the Fry and Wheeler-Smith Formulas, and between the Spache and Wheeler-Smith Formulas when applied to the easy-to-read books included in the Children's Catalog.

Table 9 presents the relationship and amount of explained variance involved with the Fry, Wheeler-Smith and .Spache Formulas, as revealed in the present study.

After analyzing all possible relationships between the three readability formulas, all were significantly related beyond the 0.0001 level of confidence.

The correlation between the Spache and Wheeler-Smith readability estimates proved to be highest with a .6909 relationship. This amount of correlation explains 47.7 percent of the variance. The coefficient for the Spache and Fry grading scores was .6786, only very slightly lower than the Spache and Wheeler-Smith correlation. This accounted

TABLE 8

HIGHEST AND LOWEST SUBSCORE IN ACCORDANCE
WITH PUBLISHER'S SERIES***

Series	Number of Samples	Fry	Spache	Wheeler-Smith
Follett Beginning-to-Read	2	P - 1	1.6 - 3.3	P - 2
Follett Beginning Science	1	1 - 3	2.0 - 3.0	1 - 2
Putnam. See and Read Beginning to Read	2	1 - 6	2.3 - 3.4	3**
Houghton. Read by Yourself	1	P - 2	1.8 - 3.1	1 - 2
Random. Bright and Early	1	P*	1.0*	P**
Random Beginner Books	11	P - 2	1.6 - 3.1	P - 1
Knopf Read Alone Books	2	1 - 7	2.1 - 6.3	2 - 3
Harper. An Early I Can Read	2	P - 1	1.6 - 2.4	P**
Harper. An I Can Read Book	29	P - 5	1.5 - 4.4	P - 4
Harper. An I Can Read History	4	1 - 5	2.3 - 3.8	2 - 4
Harper. An I Can Read Mystery	7	P - 3	1.9 - 3.5	P - 2
Harper. A Science I Can Read	14	P - 6	1.9 - 4.0	P - 3
Harper. A Sports I Can Read	3	P - 1	1.7 - 2.9	P - 2

*No difference in limits due to only one sample.
**No difference in limits due to equality of subscores.
***For mathematical purposes all primer and below books were given a 1.0 grading.

TABLE 9

AMOUNT OF RELATIONSHIP AND AMOUNT OF EXPLAINED
VARIANCE BETWEEN THE THREE READABILITY
FORMULA COMBINATIONS*

Spache and Fry

Amount of relationship $\quad\quad r = .6786$

Amount of explained variance $\quad r^2 = .4606$ (46.1%)

Spache and Wheeler-Smith

Amount of relationship $\quad\quad r = .6909$

Amount of explained variance $\quad r^2 = .4774$ (47.7%)

Fry and Wheeler-Smith

Amount of relationship $\quad\quad r = .6381$

Amount of explained variance $\quad r^2 = .4072$ (40.7%)

*Data computation for this table was made possible through the University of Southern Mississippi Data Processing Center, using the Veldman Regran program on the Zerox Sigma 9 Computer.

for 46.1 percent of the variance in the criterion variable.
The Fry and Wheeler-Smith readability estimates had a coefficient of .6381. The extent of this relationship explains
40.7 percent of the variance.

This moderate relationship exists between all pairs
of the formulas. Thus, all three have approximately the
same capability of measuring the readability level of a book.

Summary

The analysis of the data was organized into three
sections that focused on the three aspects related to the
problem statement.

The means of the Fry Formula showed the majority of
the books readable at the first grade level. However, only
sixty-three percent were readable at the second grade level
if maximum subscore is the criterion.

With both the Spache and Wheeler-Smith Formula means,
the majority of the books were second grade level. However,
Wheeler and Smith noted that independent reading books should
be at least one level below that indicated by a formula.
When maximum subscores are considered, the Spache formula
results indicated only forty-three percent were readable at
second grade level.

Comparisons were made between the Children's Catalog
grading and that determined by formula application. Only
eight percent of the book means exceeded the maximum Children's Catalog grading. However, sixty percent or more of

the books exceeded the minimum Children's Catalog grade level when the Spache and Wheeler-Smith formulas were applied. The maximum subscores of the Spache and Fry Formula were higher than the Children's Catalog maximum grading in thirty-five percent of the books and above minimum grading in sixty-six percent or more.

The subscore range was too great in the books for the mean to be a safe readability criterion. In sixty-six percent or more of the cases it exceeded eight months for the Spache Formula and one year for the Fry Formula. In addition the Fry Formula application showed an increase over the initial subscore of more than a year in fifty-three percent of the books. The same comparison with the Spache Formula indicated an increase of more than eight months in thirty-five percent of the books.

An analysis of both mean scores and range by publishers' series gave no clues for actual meaning of an easy-to-read appellation. Results of the formula application showed mean ranges within series as great as primer to third grade. Subscore ranges were often in excess of three grade levels.

Lastly, it was determined that a moderate relationship exists between the Spache and Fry Formulas, between the Spache and Wheeler-Smith Formulas, and between the Fry and Wheeler-Smith Formulas when applied to the easy-to-read books listed in the Children's Catalog.

CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Summary of Problem and Procedure

The basic problem of the study was to determine the readability level of the seventy-nine easy-to-read books receiving primary level grading in the 1971 <u>Children's Catalog</u> through the use of three readability formulas. It was planned in order to make research information available for teachers and librarians responsible for the selection of trade books for beginning readers. The Fry, Spache, and Wheeler-Smith Formulas were applied to the seventy-nine books. The complete text of each book was evaluated within the sample framework of each formula. The subscores were recorded and the book means for each formula were determined. The summary of the findings that resulted from this study follows.

Findings

Three questions were proposed that were facets of the problem of the study. The findings were interpreted in relation to three questions.

1. What are the readability levels for the easy-to-read series, as indicated by both the mean and the upper limit of the subscores of the Fry, Spache, and Wheeler-Smith readability level estimates and how do they compare with the Children's Catalog grading?

An observable difference was revealed when the grade level estimates indicated by the means were compared with those demonstrated by the upper limits of the subscore. The means derived by the Fry Formula showed seventy-three percent of the books readable for first grade readers, and all but three were assessed to be of second grade readability level. However, when the subscores became the reference frame, only sixty-three percent were readable by second grade readers.

The Spache Formula means revealed nine percent were first grade level, and all but fourteen percent were readable on the second grade level. The subscores showed only four percent were a first grade level of difficulty and only forty-three percent had no sections of difficulty for the second grade level.

Ninety-seven percent of the books used in the study needed only three samples to apply the Wheeler-Smith Formula to the entire text. Therefore, very little difference was seen between mean and subscore data. Eighty-six percent were readable on the second grade level, even with subscore analysis.

Based on the maximum Children's Catalog grade level, the reading level was underestimated in only eight percent of the book means determined by any formula. However, the

maximum subscores computed by the Fry and Spache Formulas
exceeded the maximum Children's Catalog level by at least
one grade designation in thirty-five percent of the books.

If the minimum Children's Catalog grade level
approach is used, the Spache and Wheeler-Smith means were
underestimated in sixty percent of the cases. The maximum
subscores readability levels of all three formulas exceed
the minimum Children's Catalog level for sixty-four percent
of the books.

2. What is the range of readability level within
each book and within each series as a whole?

Spache stated that books whose samples vary more than
six months in the first grade and eight or more in the second
grades are likely to be unsuitable at the mean reading level.
This justified the subscore emphasis in the present study,
for seventy-three percent of the books showed a subscore
range of over eight months through Spache Formula use. The
Fry Formula subscores also demonstrated a sixty-six percent
range of a year or more.

The application of the Spache and Fry Formulas also
brought to light that over twenty-nine percent of the books
began at the lowest subscore. In fifty-four percent of the
books, the Fry Formula readability levels increased a year
or more from the initial subscore. In the Spache Formula
thirty-five percent increased from the initial subscore by
eight months or more.

Because nine of the specific series examined had no more than four books recommended by the Children's Catalog, series generalizations were of necessity based on a limited sample. In the largest series, the I Can Read Books, each of the formulas showed a high and low subscore range of three years or more.

When considering the Fry and Wheeler-Smith Formulas, the mean readability estimates for the books in three different series reached grade three. Yet, in five or more series, the mean began with primer level.

3. Do statistically significant relationships exist between the Fry and Spache Formulas, between the Fry and Wheeler-Smith Formulas, and between the Spache and Wheeler-Smith Formulas when applied to the easy-to-read books included in the 1971 Children's Catalog?

The statistical analysis done in this study indicated a moderate relationship between all formula combinations. Results demonstrated highest correlations to be between the Spache and Wheeler-Smith readability estimates, with a .6909 relationship. The Spache and Fry grade level estimates had a correlation coefficient of .6786, and the Fry and Wheeler-Smith grading scores had an r of .6381. All were significantly related beyond the .0001 level of confidence. All three relationships had a capacity of explaining between 40.7 and 47.7 of the variance in the criterion formula.

The Spache Formula gave a more discriminating readability level than the other two. However, the Spache Formula does not successfully reach above grade three. This

necessitates the application of still another formula for fourth grade level materials.

The Wheeler-Smith Formula involves a large sample so the changes in readability within samples of the book are less easily discernible. The Wheeler-Smith Formula might be judged by many users to be more time-consuming to compute because no chart is provided to aid in computation.

The Fry and Wheeler-Smith Formulas depend on syllable count which may be a bit difficult for some users. If one desires to extend below first grade level, the Maginnis extension to the formula must be used.

Conclusions

Based on the results of the research, the following conclusions have been derived:

1. With the maximum Children's Catalog grade level as a frame of reference, it would appear that in general the Children's Catalog was not underestimating the mean readability level derived by the formulas. However, the fact that the Fry and Spache Formulas showed that portions of thirty-five percent of the books exceed the maximum Children's Catalog grading did indicate a form of underestimation on the part of Children's Catalog reviewers.

2. The worth of easy-to-read as a series was questionable, as evidenced by the number of books with subscore ranges of over three years.

3. The range of mean readability level within a series makes it doubtful if librarians should suggest that a child read another easy-to-read book in a series because he read and enjoyed the first.

4. An obvious generalization is that "easy-to-read" ·fails to designate a specific readability level, even within any one series.

5. It was apparent that the precision necessary for reading guidance with the first and second grade child was not provided in the Children's Catalog.

6. The increase in readability level from the initial subscore indicated by the Fry and Spache Formulas suggested that the readability of the first few pages was not a safe criterion for the younger reader. He might still meet frustration with over one-third of the books.

7. The results of the study indicated that the Fry and Wheeler-Smith Formulas measured the difficulty of material as effectively as the Spache Formula. Thus, those desiring to apply a formula to aid in the determination of reading level may select the one that seems easiest to apply.

Recommendations

As a result of this study, the following recommendations were made.

1. There is an obvious need for publishers of the easy-to-read trade books to use careful judgment when evaluating a manuscript before giving it an easy-to-read series

title. Recognizing the book's use for supplementary reading in the primary grades, the publishers should adopt some objective mode of readability assessment to make the easy-to-read title more precise.

It is commendable that the trade book publishers are seeking to meet the teacher and librarian demand for books for the beginning reader. Yet, if the books are really to aid in reading skill development, they must be free from a readability level range within the book that may result in frustration for some children.

2. Librarians should seek some objective and valid means of grade level determination for the easy-to-read series. Although formulas are not a panacea, they serve as indicators of reading level much more precisely than is now indicated by the Children's Catalog and many other selection tools.

3. The Children's Catalog reviewers should establish common criteria for assessing the readability of the easy-to-read series. This specific method of readability measurement should be printed in the preface of each edition of the Children's Catalog. Then the librarian would be able to decide whether the method was sufficiently valid, or if he wished, he could seek still other readability measures.

4. Further research is needed to determine the degree of relationship between primary level formula scores and estimates of readability arrived at in some other way. Studies

are necessary if librarians are to gain valid insight into more refined ways of predicting the readability of primary trade books and thus to find better ways of meeting the reading needs of the primary user of materials.

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APPENDIX A

FRY GRAPH FOR ESTIMATING READABILITY

GRAPH FOR ESTIMATING READABILITY[1]

by Edward Fry, Rutgers University Reading Center, New Jersey

Average number of syllables per 100 words

SHORT WORDS   LONG WORDS
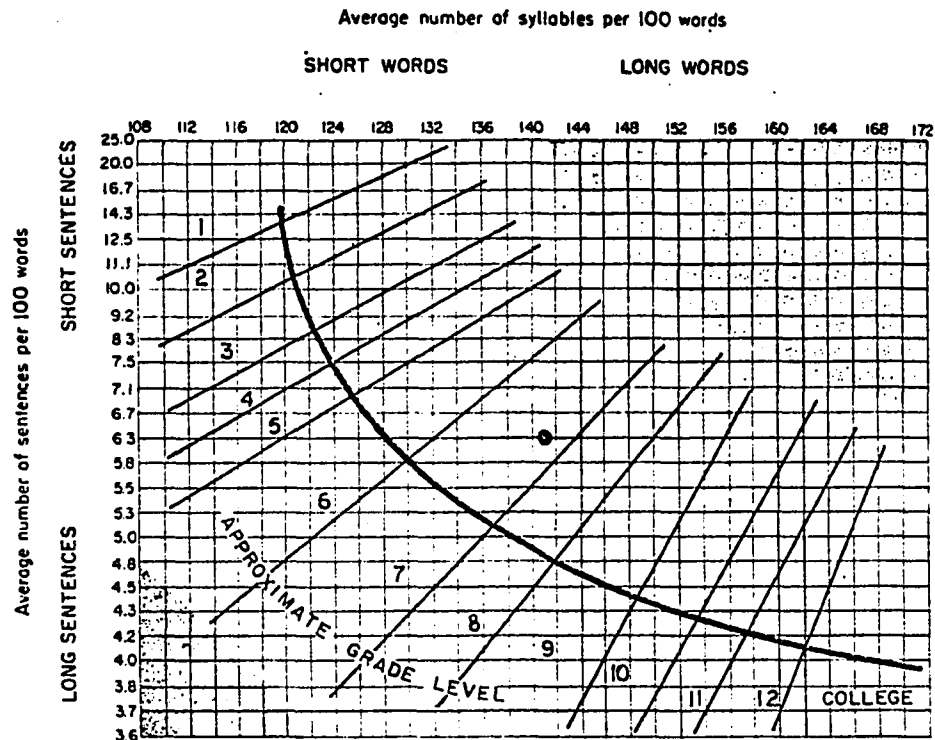
DIRECTIONS: Randomly select 3 one hundred word passages from a book or an article. Plot average number of syllables and average number of sentences per 100 words on graph to determine the grade level of the material. Choose more passages per book if great variability is observed and conclude that the book has uneven readability. Few books will fall in gray area but when they do grade level scores are invalid.

EXAMPLE:		SYLLABLES	SENTENCES
	1st Hundred Words	124	6.6
	2nd Hundred Words	141	5.5
	3rd Hundred Words	158	6.8
	AVERAGE	141	6.3

READABILITY 7th GRADE (see dot plotted on graph)

[1]Edward Fry, "A Readability Formula That Saves Time," Journal of Reading 7 (April 1968): 14.

APPENDIX B

FRY'S READABILITY GRAPH EXTENDED

THRU PREPRIMER LEVEL

FRY'S READABILITY GRAPH[1]

EXTENDED THRU PREPRIMER LEVEL

Average number of syllables per 100 words
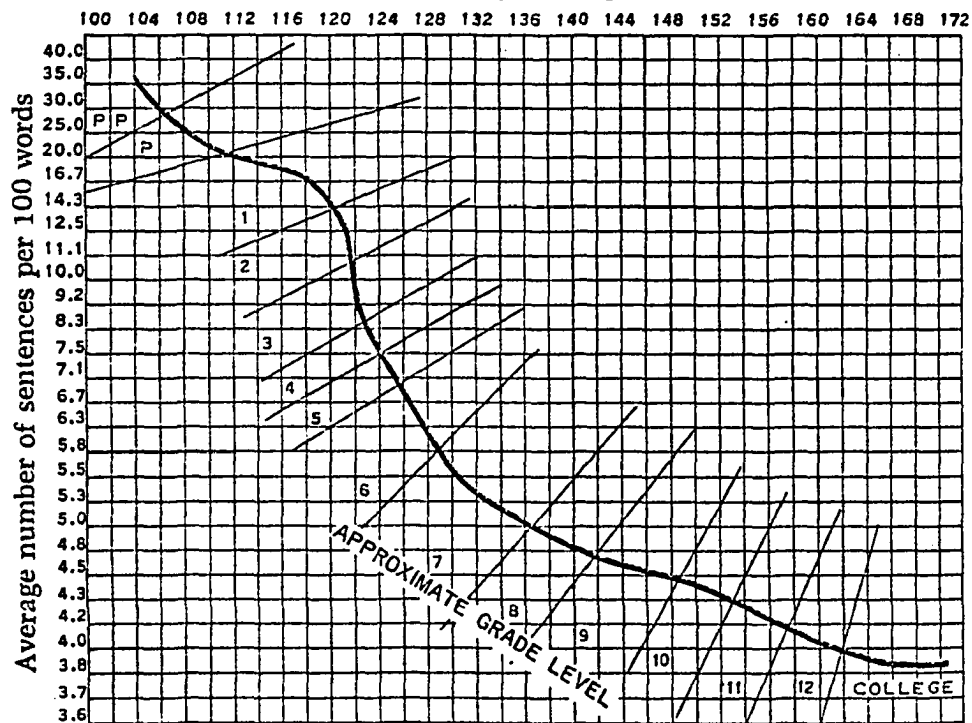
[1]Maginnis, "Readability," p. 518.

APPENDIX C

STEPS IN APPLYING THE SPACHE FORMULA

STEPS IN APPLYING THE SPACHE FORMULA

The following steps were given by Spache for evaluating a book.[1]

1. Prepare a Worksheet.

2. Count off approximately 100 words in the early part of the book. Begin at the beginning of a sentence and end the count with the last word of the sentence containing the 100th word.

3. Write the number of words in the Worksheet on line 1.

4. Count the number of sentences in the sample. Write the number of sentences in the worksheet on line 2.

5. Check the separate words in the sample against the Stone Revised Word List. Make a count of the number of words not found in this list.

6. Write the number of hard words in the Worksheet on line 3.

7. Divide the number of words in the sample by the number of sentences to find the average sentence length (line 4).

8. Divide the number of hard words by the number of words in the sample to find the per cent of hard words. Drop the decimal point. (Line 5.)

9. Multiply average sentence length (line 4) by .141. Write product on line 6.

10. Multiply per cent of hard words (line 5) by .086. Write product on line 7.

11. Add the figures on lines 6, 7 and the constant, .839.

12. The sum is an estimate of the grade level of difficulty of the selection.

13. Repeat steps 1-11, with samples from the middle and rear of the book. Use at least 5-10 samples depending upon the length of the book.

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[1]Spache, Good Reading, p. 197.

14. Determine the average grade placement of the book by adding the estimates and dividing by the number of samples. This is the final estimate of the grade level of difficulty of the entire book. Drop the last figure or round it off, as 2.367 = 2.4.

The following rules were given by Spache to clarify the word counting involved in comparing the words in the book with the Stone Revised Word List.[2]

1. Count all letters and numbers in figures as familiar.

2. Proper nouns, or names of persons, places are counted as familiar.

3. Count regular verb forms as familiar. This includes ing, es, ed, and changes involving doubling of the final consonant, dropping the final e, changing y to i.

4. Count regular plurals and possessive ending of nouns as familiar. Plurals in s, es, ies are familiar; those, as in ox-oxen, goose-geese, are unfamiliar unless on the list.

5. Count adjectival or adverbial endings, as ily, er, est, ly as unfamiliar unless on the list.

6. Count a word as unfamiliar only once even though it appears again or with variable endings later in the sample.

7. A group of words, consisting of the repetition of a single word or exclamation, as oh, oh, oh; look, look, look, is counted as a single sentence regardless of punctuation.

8. Count hyphenated words as unfamiliar unless both parts appear in the word list.

9. Count contractions, as didn't, unfamiliar unless on the list.

10. Count hyphenated words, compound words and numbers in figures as one word.

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[2]Ibid., p. 198.

Other Suggestions

1. Analyze each sample independently, i.e. words counted as unfamiliar in any sample are again unfamiliar in subsequent samples.

2. Count single or two-word sentences as such in determining average sentence length, as in directions and some pre-primers.

3. Avoid sampling material that is not typical of continuous matter, e.g. avoid dialogue, headings, titles.

4. Avoid sampling consistently at the beginning or end of chapters . . .

APPENDIX D

CLARENCE R. STONE'S REVISION OF THE

DALE LIST OF 769 EASY WORDS

CLARENCE R. STONE'S REVISION OF THE
DALE LIST OF 769 EASY WORDS[1]

a	bag	blue	car	cry
about	bake	board	care	cup
across	baker	boat	careful	cut
afraid	ball	book	carry	
after	balloon	both	cat	dance
afternoon	band	bottom	catch	dark
again	bang	bow	caught	day
air	bark	bowl	cent	dear
airplane	barn	bow-bow	chair	deep
all	barnyard	box	chick	deer
almost	basket	boy	chicken	did
alone	bath	branch	child	dig
along	be	bread	children	dinner
already	bear	break	circus	dish
also	beautiful	breakfast	Christmas	do
always	became	bright	city	does
am	because	bring	clap	dog
an	bed	brother	clean	doll
and	bedroom	brought	climb	done
animal	bee	brown	close	don't
another	been	bug	clothes	door
answer	before	build	clown	down
any	began	building	cluck	draw
anyone	begin	bump	coat	dress
anything	behind	bunny	cock-a-	drink
apple	being	bus	doodle-doo	drive
are	believe	busy	cold	drop
arm	bell	but	color	dry
around	belong	butter	come	duck
arrow	beside	buy	coming	
as	best	buzz	cook	each
ask	better	by	cooky(ie)	ear
asleep	between		corn	early
at	big	cabbage	corner	east
ate	bigger	cage	could	eat
away	bill	cake	count	egg
automobile	bird	calf	country	else
	birthday	call	cover	elephant
baa	bit	came	cow	end
baby	black	can	cried	engine
back	blew	candy	cross	enough
bad	blow	cap	crumb	even

[1]Ibid., pp. 199-201.

ever	fun	her	know	might
every	funny	here		mile
everything		herself	lady	milk
eye	game	hid	laid	milkman
	garden	hide	lamb	mill
face	gate	high	land	minute
fall	gave	hill	large	miss
family	get	him	last	Miss
far	girl	himself	late	money
farm	give	his	laugh	monkey
farmer	glad	hit	lay	moo
fast	go	hold	learn	more
fat	goat	hole	leaves	morning
father	God	home	left	most
feather	going	honey	leg	mother
feed	gold	hop	let	mouse
feel	gone	horn	let's	mouth
feet	good	horse	letter	move
fell	good-by	hot	lie	Mr.
felt	got	house	light	Mrs.
fence	grandfather	how	like	much
few	grandmother	hungry	line	mud
field	grass	hunt	lion	music
fill	gray	hurry	listen	must
find	great	hurt	little	my
fine	green		live	
finish	grew	I	log	nail
fire	ground	ice	long	name
first	grow	if	look	near
fish	guess	I'll	lost	neck
fit		in	lot	need
five	had	Indian	loud	nest
flag	hair	inside	love	never
flew	hall	into	lunch	new
floor	hand	is		next
flower	happen	it	made	nice
fly	happy	its	mail	night
follow	hard		make	no
food	has	jar	man	noise
foot	hat	joke	many	north
for	have	jump	march	nose
found	hay	just	matter	not
four	he		may	note
fox	head	keep	me	nothing
fresh	hear	kept	meat	now
friend	heard	kill	meet	nut
frog	heavy	kind	men	
from	held	kitchen	meow	of
front	hello	kitten	met	off
fruit	help	knew	mew	often
full	hen	knock	mice	oh

old	pretty	seat	soon	that
on	puff	see	sound	the
once	pull	seed	soup	their
one	push	seem	splash	them
only	put	seen	spot	then
open	puppy	sell	spring	there
or		send	squirrel	these
orange	quick	sent	stand	they
other	quiet	set	star	thin
our	quite	seven	start	thing
out		shake	station	think
outside	rabbit	shall	stay	this
over	race	she	step	those
own	rain	shell	stick	though
	rake	sheep	still	thought
paint	ran	shine	stone	three
pan	read	shoe	stood	threw
paper	ready	shop	stop	throw .
park	real	short	store	ticket
part	red	should	story	tie
party	rest	show	straight	tiger
pat	ride	shut	street	time
paw	right	sick	string	tired
pity	ring	side	strong	to
peanut	river	sign	such	today .
peep	road	sing	suit	toe
pennies	roar	sister	summer	together
people	robin	sit	sun	told
pet	rock	six	sunshine	tomorrow
pick	rode	skate	sure	too
picnic	roll	skin	surprise	took
picture	roof	skip	swam	top
pie	room	sky	sweet	town
piece	rooster	sled	supper	toy
pig	root	sleep	swim	train
pink	rope	sleepy	swing	tree
place	round	slide		trick
plan	row	slow	table	tired
plant	rub	small	tail	trunk
play	run	smell	take	try
please		smile	talk	turkey
pocket	said	smoke	tall	turn
point	same	sniff	tap	turtle
policeman	sand	snow	teach	two
pond	sang	so	teacher	
pony	sat	soft	teeth	uncle
pop	save	sold	tell	under
poor	saw	some	ten	umbrella
post	say	something	tent	until
present	school	sometime	than	up
press	sea	song	thank	upon

us   without
use   woman
                  wonder
vegetable   wood
very   woke
visit   wolf
voice   word
                  work
wagon   world
wait   worm
wake   would
walk   write
want
war   yard
warm   year
was   yellow
wash   yes
watch   you
water   your
wave
way   zoo
we
wear
wee
weed
week
well
went
were
west
wet
what
wheat
wheel
when
where
which
while
white
who
why
wide
wild
will
win
wind
window
wing
winter
wish
with

APPENDIX E

CLYMER'S TABLES FOR RAPID COMPUTATION

OF SPACHE READABILITY SCORES

TABLE 10

SENTENCE LENGTH[1]

		Number of Words in Sample									
		100	101	102	103	104	105	106	107	108	109	110
Number of sentences in sample	7	2.014	2.034	2.055	2.075	2.095	2.115	2.135	2.155	2.175	2.196	2.216
	8	1.762	1.780	1.798	1.815	1.833	1.851	1.868	1.886	1.904	1.921	1.939
	9	1.567	1.582	1.598	1.614	1.629	1.645	1.661	1.676	1.692	1.708	1.723
	10	1.410	1.424	1.438	1.452	1.466	1.480	1.495	1.509	1.523	1.537	1.551
	11	1.282	1.295	1.308	1.320	1.333	1.346	1.359	1.372	1.384	1.397	1.410
	12	1.175	1.187	1.198	1.210	1.222	1.234	1.246	1.257	1.269	1.281	1.292
	13	1.085	1.096	1.106	1.117	1.128	1.139	1.150	1.160	1.171	1.182	1.193
	14	1.007	1.017	1.027	1.037	1.047	1.058	1.068	1.078	1.088	1.098	1.108
	15	.940	.949	.959	.968	.978	.987	.996	1.006	1.015	1.025	1.034
	16	.881	.890	.899	.908	.916	.925	.934	.943	.952	.961	.969
	17	.829	.838	.846	.854	.863	.871	.879	.888	.896	.904	.912
	18	.783	.791	.799	.807	.815	.822	.830	.838	.846	.854	.862
	19	.742	.750	.757	.764	.772	.779	.787	.794	.802	.809	.816
	20	.705	.712	.719	.726	.733	.740	.747	.754	.761	.768	.776
	21	.671	.678	.685	.692	.698	.705	.712	.718	.725	.732	.739
	22	.641	.647	.654	.660	.666	.673	.679	.686	.692	.699	.705
	23	.613	.619	.625	.631	.638	.644	.650	.656	.662	.668	.674
	24	.588	.593	.599	.605	.611	.617	.623	.629	.634	.640	.646

[1]Ibid., p. 202-3.

TABLE 10--Continued

		Number of Words in Sample									
		111	112	113	114	115	116	117	118	119	120
Number of sentences in sample	7	2.236	2.256	2.276	2.296	2.316	2.337	2.357	2.377	2.397	2.417
	8	1.956	1.974	1.992	2.009	2.027	2.044	2.062	2.080	2.097	2.115
	9	1.739	1.755	1.770	1.786	1.802	1.817	1.833	1.849	1.864	1.880
	10	1.565	1.579	1.593	1.607	1.622	1.636	1.650	1.664	1.678	1.692
	11	1.423	1.436	1.448	1.461	1.474	1.487	1.500	1.512	1.525	1.538
	12	1.304	1.316	1.328	1.340	1.351	1.363	1.375	1.386	1.398	1.410
	13	1.204	1.215	1.226	1.236	1.247	1.258	1.269	1.280	1.291	1.302
	14	1.118	1.128	1.138	1.148	1.158	1.168	1.178	1.188	1.198	1.209
	15	1.043	1.053	1.062	1.072	1.081	1.090	1.100	1.109	1.118	1.128
	16	.978	.987	.996	1.005	1.013	1.022	1.031	1.040	1.049	1.058
	17	.921	.929	.937	.946	.954	.962	.970	.979	.987	.995
	18	.870	.877	.885	.893	.901	.909	.916	.924	.932	.940
	19	.824	.831	.839	.846	.853	.861	.868	.876	.883	.890
	20	.782	.790	.797	.804	.811	.818	.825	.832	.839	.846
	21	.745	.752	.759	.765	.772	.779	.786	.792	.799	.806
	22	.711	.718	.724	.731	.737	.744	.750	.756	.763	.769
	23	.680	.687	.693	.699	.705	.711	.717	.723	.730	.736
	24	.652	.658	.664	.670	.676	.682	.687	.693	.699	.705

TABLE 11

"HARD WORDS"[2]

						Number of Words in Sample						
		100	101	102	103	104	105	106	107	108	109	110
	0	.839	.839	.839	.839	.839	.839	.839	.839	.839	.839	.839
	1	.925	.924	.923	.923	.922	.921	.920	.919	.919	.918	.917
	2	1.011	1.009	1.008	1.006	1.004	1.003	1.001	1.000	.998	.997	.995
	3	1.097	1.094	1.092	1.090	1.087	1.085	1.082	1.080	1.078	1.076	1.073
	4	1.183	1.180	1.176	1.173	1.170	1.167	1.163	1.161	1.157	1.155	1.152
	5	1.269	1.265	1.261	1.257	1.253	1.249	1.245	1.241	1.237	1.233	1.230
	6	1.355	1.350	1.345	1.340	1.335	1.330	1.326	1.321	1.317	1.312	1.308
	7	1.441	1.435	1.429	1.423	1.418	1.412	1.407	1.402	1.396	1.391	1.386
Number of "Hard Words"	8	1.527	1.520	1.513	1.507	1.501	1.494	1.488	1.482	1.476	1.470	1.465
	9	1.613	1.605	1.598	1.591	1.583	1.576	1.569	1.562	1.556	1.549	1.543
	10	1.699	1.691	1.682	1.674	1.666	1.658	1.650	1.643	1.635	1.628	1.621
	11	1.785	1.776	1.766	1.757	1.749	1.740	1.731	1.723	1.715	1.707	1.700
	12	1.871	1.861	1.851	1.841	1.831	1.822	1.813	1.803	1.795	1.786	1.777
	13	1.957	1.946	1.936	1.924	1.914	1.904	1.894	1.884	1.874	1.865	1.855
	14	2.043	2.031	2.019	2.008	1.997	1.986	1.975	1.964	1.954	1.944	1.933
	15	2.129	2.116	2.104	2.091	2.079	2.068	2.056	2.045	2.033	2.023	2.012
	16	2.215	2.201	2.188	2.175	2.162	2.149	2.137	2.125	2.113	2.101	2.090
	17	2.301	2.287	2.272	2.258	2.245	2.231	2.218	2.205	2.193	2.180	2.168

[2]Ibid., pp. 204-5.

TABLE 11--Continued

		Number of Words in Sample									
		111	112	113	114	115	116	117	118	119	120
	0	.839	.839	.839	.839	.839	.839	.839	.839	.839	.839
	1	.917	.916	.915	.914	.914	.913	.913	.912	.911	.911
	2	.994	.993	.991	.990	.989	.987	.986	.985	.983	.982
	3	1.071	1.069	1.067	1.065	1.063	1.061	1.059	1.058	1.056	1.054
	4	1.149	1.146	1.143	1.141	1.138	1.136	1.133	1.131	1.128	1.126
	5	1.226	1.223	1.219	1.216	1.213	1.210	1.207	1.203	1.200	1.197
	6	1.304	1.300	1.296	1.292	1.288	1.284	1.280	1.276	1.273	1.269
	7	1.381	1.377	1.372	1.367	1.363	1.358	1.353	1.349	1.345	1.341
	8	1.459	1.453	1.448	1.443	1.437	1.432	1.427	1.422	1.417	1.412
	9	1.536	1.530	1.524	1.518	1.512	1.506	1.501	1.495	1.489	1.484
	10	1.614	1.607	1.600	1.593	1.587	1.580	1.574	1.568	1.562	1.556
	11	1.691	1.684	1.676	1.669	1.662	1.655	1.647	1.641	1.634	1.627
	12	1.769	1.760	1.752	1.744	1.736	1.729	1.721	1.714	1.706	1.699
	13	1.846	1.837	1.828	1.820	1.811	1.803	1.795	1.787	1.779	1.771
	14	1.924	1.914	1.905	1.895	1.886	1.877	1.868	1.859	1.851	1.842
	15	2.001	1.991	1.981	1.971	1.961	1.951	1.942	1.932	1.923	1.914
	16	2.079	2.068	2.057	2.046	2.035	2.025	2.015	2.005	1.995	1.986
	17	2.156	2.144	2.133	2.121	2.110	2.099	2.089	2.078	2.068	2.057

Number of "Hard Words"

APPENDIX F

WORKSHEET FOR APPLICATION OF THE

FRY READABILITY FORMULA

WORKSHEET FOR APPLICATION OF THE

FRY READABILITY FORMULA

BOOK_____ DATE_____

AUTHOR_____ PUBLISHER_____

	Sentences per 100 words	Syllables per 100 words
1. 100 word sample on pgs. ___ to ___	_____	_____
2. 100 word sample on pgs. ___ to ___	_____	_____
3. 100 word sample on pgs. ___ to ___	_____	_____
4. 100 word sample on pgs. ___ to ___	_____	_____
5. 100 word sample on pgs. ___ to ___	_____	_____
6. 100 word sample on pgs. ___ to ___	_____	_____
7. 100 word sample on pgs. ___ to ___	_____	_____
8. 100 word sample on pgs. ___ to ___	_____	_____
9. 100 word sample on pgs. ___ to ___	_____	_____
10. 100 word sample on pgs. ___ to ___	_____	_____
11. 100 word sample on pgs. ___ to ___	_____	_____
12. 100 word sample on pgs. ___ to ___	_____	_____

WORKSHEET--<u>Continued</u>

13. 100 word sample on
    pgs. ___ to ___   _____   _____

14. 100 word sample on
    pgs. ___ to ___   _____   _____

15. 100 word sample on
    pgs. ___ to ___   _____   _____

  Total   _____   _____

  Average   _____   _____

  Plotted on graph--Grade   _____   _____

$

APPENDIX G

WORKSHEET FOR APPLICATION OF THE

SPACHE READABILITY FORMULA

WORKSHEET FOR APPLICATION OF THE SPACHE READABILITY FORMULA[1]

BOOK_____ DATE_____

AUTHOR_____ PUBLISHER_____

	Page___ From___ To___	Page___ From___ To___	Page___ From___ To___	Page___ From___ To___	Page___ From___ To___	Page___ From___ To___
1. No. of words						
2. No. of sentences						
3. No. of words not on Stone Rev. Word List						
4. Average sentence length ($\div$1 by 2)						
5. % hard words ($\div$3 by 1, x100)						
6. Multiply (4) by .141						
7. Multiply (5) by .086						
8. Constant	.839	.839	.839	.839	.839	.839
9. Estimated grade placement (add 6, 7, & 8)						

Average grade
placement of_____ samples_____

Analyzed by_____

Date_____

_____

[1]Spache, Good Reading, p. 195.

APPENDIX H

WORKSHEET FOR APPLICATION OF THE WHEELER-

SMITH READABILITY FORMULA

WORKSHEET FOR APPLICATION OF THE WHEELER-SMITH READABILITY FORMULA

BOOK_____ DATE_____

AUTHOR_____ PUBLISHER_____

		From Page____ To_____	From Page____ To_____	From Page____ To_____	From Page____ To_____	From Page____ To_____	From Page____ To_____
1.	No. of words	_____	_____	_____	_____	_____	_____
2.	No. of units	_____	_____	_____	_____	_____	_____
3.	Average unit length	_____	_____	_____	_____	_____	_____
4.	No. of polysyllabic words	_____	_____	_____	_____	_____	_____
5.	% of polysyllabic words	_____	_____	_____	_____	_____	_____
6.	Average unit length times % of poly-syllabic words	_____	_____	_____	_____	_____	_____
7.	Times 10	_____	_____	_____	_____	_____	_____
8.	Grade level from Table	_____	_____	_____	_____	_____	_____

Table of Norms[1]

Primer 4.0 to 8.0
1st Reader 8.1 to 11.5
2nd Reader 11.6 to 19
3rd Reader 19.1 to 26.5
4th Reader 26.6 to 34.5

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[1]Wheeler, "Practical Readability Formula," p. 398.

APPENDIX I

MEAN READABILITY LEVEL, FIRST SAMPLE SUBSCORE,

RANGE LIMITS, RANGE, AND CHILDREN'S CATALOG

GRADING FOR EACH BOOK

TABLE 12

MEAN READABILITY LEVEL, FIRST SAMPLE SUBSCORE, RANGE LIMITS, RANGE,
AND CHILDREN'S CATALOG GRADING FOR EACH BOOK*

	Title and Series	Formula	Mean Read-ability Estimate	First Sample Subscore	Range Limits	Range	CC Grading
1.	The Amazing Animals of Australia (Putnam See and Read Beginning to Read)	Fry Spache Wheeler-S.	3(3.5) 2.9 3(3.5)	3(3.5) 3.0 3(3.5)	2-6(2.5-6.5) 2.6-3.4 All 3(3.5)	4.1 .9 0	2-4 (2.5-4.5)
2.	Animal Doctors--What Do They Do? (Harper-- An I Can Read Book)	Fry Spache Wheeler-S.	2(2.5) 3.0 3(3.5)	4(4.5) 3.9 3(3.5)	1-5(1.5-5.5) 2.3-4.4 All 3(3.5)	4.1 2.2 0	K-2 (1.0-2.5)
3.	Are You My Mother? (Random--Beginner Books)	Fry Spache Wheeler-S.	1(1.5) 1.8 P(1.0)	1(1.5) 1.6 P(1.0)	P-1(1.0-1.5) 1.6-2.0 All P(1.0)	0.6 0.5 0	E (1.0-2.5)
4.	Bears on Wheels** (Random--A Bright and Early Book)	Fry Spache Wheeler-S.	P(1.0) 1.0 P(1.0)	P(1.0) 1.0 P(1.0)	1 sample, no range 1 sample, no range P(1.0)		E (1.0-2.5)
5.	Beginning-to-Read Riddles and Jokes (Follett--Beginning to Read)	Fry Spache Wheeler-S.	P(1.0) 2.3 P(1.0)	1(1.5) 2.8 P(1.0)	P-1(1.0-1.5) 1.6-3.3 All P(1.0)	0.6 1.8 0	1-3 (1.5-3.5)
6.	Benny's Animals (Harper--A Science I Can Read)	Fry Spache Wheeler-S.	2(2.5) 2.8 2(2.5)	2(2.5) 2.5 2(2.5)	1-4(1.5-4.5) 2.1-3.9 All 2(2.5)	3.1 1.9 0	1-3 (1.5-3.5)

TABLE 12--Continued

	Title and Series	Formula	Mean Readability Estimate	First Sample Subscore	Range Limits	Range	CC Grading
7.	Big Ball of String (Random--Beginner Books)	Fry Spache Wheeler-S.	P(1.0) 2.5 P(1.0)	1(1.5) 1.9 P(1.0)	P-2(1.0-2.5) 1.9-3.3 All P(1.0)	1.6 1.5 0	E (1.0-2.5)
8.	Binky Brothers, Detectives (Harper--An I Can Read Mystery)	Fry Spache Wheeler-S.	1(1.5) 2.7 2(2.5)	1(1.5) 2.5 2(2.5)	All 1(1.5) 2.1-3.2 All 2(2.5)	0 1.2 0	E (1.0-2.5)
9.	Book of Animal Riddles (Random--Beginner Books)	Fry Spache Wheeler-S.	1(1.5) 2.6 1(1.5)	1(1.5) 2.3 P(1.0)	P-2(1-2.5) 2.3-3.1 P-1(1.0-1.5)	1.6 0.9 .6	K-2 (1.0-2.5)
10.	Book of Riddles (Random--Beginner Books)	Fry Spache Wheeler-S.	1(1.5) 2.2 P(1.0)	1(1.5) 2.4 1(1.5)	P-1(1.0-1.5) 2.0-2.4 P-1(1.0-1.5)	.6 .5 .6	K-2 (1.0-2.5)
11.	Case of the Cat's Meow (Harper--An I Can Read Mystery)	Fry Spache Wheeler-S.	1(1.5) 2.6 2(2.5)	1(1.5) 2.2 2(2.5)	1-2(1.5-2.5) 2.2-3.1 All 2(2.5)	1.1 1.0 0	E (1.0-2.5)
12.	The Case of the Dumb Bells (Harper--An I Can Read Mystery)	Fry Spache Wheeler-S.	1(1.5) 2.7 2(2.5)	2(2.5) 2.9 2(2.5)	1-2(1.5-2.5) 2.1-3.5 1-2(1.5-2.5)	1.1 1.5 1.1	E (1.0-2.5)
13.	Case of the Hungry Stranger (Harper--An I Can Read Mystery)	Fry Spache Wheeler-S.	1(1.5) 2.3 1(1.5)	1(1.5) 2.2 2(2.5)	P-1(1.0-1.5) 1.9-2.7 1-2(1.5-2.5)	.6 .9 1.1	E (1.0-2.5)

TABLE 12--<u>Continued</u>

Title and Series	Formula	Mean Read-ability Estimate	First Sample Subscore	Range Limits	Range	CC Grading
14. Cat in the Hat (Random--Beginner Books)	Fry Spache Wheeler-S.	P(1.0) 2.2 P(1.0)	P(1.0) 1.8 P(1.0)	All P(1.0) 1.8-3.4 All P(1.0)	0 1.7 0	E (1.0-2.5)
15. Cat in the Hat Comes Back (Random-- Beginner Books)	Fry Spache Wheeler-S.	P(1.0) 2.2 P(1.0)	1(1.5) 2.0 P(1.0)	P-1(1.0-1.5) 1.9-3.4 All P(1.0)	.6 1.6 0	1-2 (1.5-2.5)
16. Chester (Harper-- An I Can Read Book)	Fry Spache Wheeler-S.	1(1.5) 2.1 1(1.5)	1(1.5) 2.2 1(1.5)	All 1(1.5) 1.8-2.3 All 1(1.5)	0 .6 0	E (1.0-2.5)
17. Cindy's Sad and Happy Tree (Knopf-- Read Alone Book)	Fry Spache Wheeler-S.	3(3.5) 3.6 3(3.5)	2(2.5) 3.3 2(2.5)	1-7(1.5-7.5) 2.4-6.3 2-3(2.5-3.5)	6.1 4.0 1.1	K-3 (1.0-3.5)
18. Come and Have Fun (Harper--Early I Can Read Book)	Fry Spache Wheeler-S.	P(1.0) 1.8 P(1.0)	P(1.0) 1.6 P(1.0)	P-1(1.0-1.5) 1.6-2.4 All P(1.0)	.6 .9 0	E (1.0-2.5)
19. Danny and the Dino-saur (Harper--An I Can Read Book)	Fry Spache Wheeler-S.	2(2.5) 2.5 2(2.5)	1(1.5) 2.1 1(1.5)	1-4(1.5-4.5) 2.0-3.2 1-2(1.5-2.5)	3.1 1.3 1.1	E (1.0-2.5)
20. Doctors and Nurses-- What Do They Do? Harper--An I Can Read Book	Fry Spache Wheeler-S.	1(1.5) 2.5 2(2.5)	2(2.5) 3.1 2(2.5)	1-3(1.5-3.5) 2.1-3.1 1-2(1.5-2.5)	2.1 1.1 1.1	K-2 (1.0-2.5)

TABLE 12--Continued

	Title and Series	Formula	Mean Read-ability Estimate	First Sample Subscore	Range Limits	Range	CC Grading
21.	Egg to Chick (Harper--A Science I Can Read)	Fry Spache Wheeler-S.	2(2.5) 2.8 2(2.5)	2(2.5) 2.3 2(2.5)	1-5(1.5-5.5) 2.2-3.4 All 2(2.5)	4.1 ·1.3 0	K-2 (1.0-2.5)
22.	Emmett's Pig (Harper--An I Can Read Book)	Fry Spache Wheeler-S.	1(1.5) 2.5 2(2.5)	2(2.5) 2.0 2(2.5)	1-3(1.5-3.5) 1.9-3.5 All 2(2.5)	2.1 1.7 0	E (1.0-2.5)
23.	The Fire Cat (Harper--An I Can Read Book)	Fry Spache Wheeler-S.	1(1.5) 2.5 2(2.5)	1(1.5) 2.3 2(2.5)	P-3(1.0-3.5) 2.1-3.1 All 2(2.5)	2.6 1.1 0	E (1.0-2.5)
24.	The Five Pennies (Knopf--Read Alone Books)	Fry Spache Wheeler-S.	1(1.5) 2.3 2(2.5)	1(1.5) 2.1 2(2.5)	1-2(1.5-2.5) 2.1-2.6 All 2(2.5)	1.1 .6 0	E (1.0-2.5)
25.	A Fly Went By (Random--Beginner Books)	Fry Spache Wheeler-S.	P(1.0) 2.2 P(1.0)	P(1.0) 2.1 P(1.0)	All P 1.8-2.8 All P(1.0)	0 1.1 0	E (1.0-2.5)
26.	Franklin Delano Roosevelt (Putnam See and Read Beginning to Read)	Fry Spache Wheeler-S.	2(2.5) 2.8 3(3.5)	2(2.5) 2.7 3(3.5)	1-3(1.5-3.5) 2.3-3.4 All 3(3.5)	2.1 1.2 0	2-4 (2.5-4.5)
27.	A Ghost Named Fred (Harper--An I Can Read Mystery)	Fry Spache Wheeler-S.	1(1.5) 2.9 1(1.5)	3(3.5) 3.4 2(2.5)	1-3(1.5-3.5) 2.4-3.4 P-2(1.0-2.5)	2.1 1.1 1.6	E (1.0-2.5)

TABLE 12--Continued

	Title and Series	Formula	Mean Read- ability Estimate	First Sample Subscore	Range Limits	Range	CC Grading
28.	Greg's Microscope (Harper--A Science I Can Read)	Fry Spache Wheeler-S.	1(1.5) 2.4 1(1.5)	1(1.5) 2.3 1(1.5)	1-2(1.5-2.5) 2.0-2.9 All 1(1.5)	1.1 1.0 0	1-3 (1.5-3.5)
29.	Grizzwold (Harper--An I Can Read Book)	Fry Spache Wheeler-S.	1(1.5) 2.6 2(2.5)	2(2.5) 2.9 2(2.5)	1-2(1.5-2.5) 2.2-3.0 1-2(1.5-2.5)	1.1 .9 1.1	E (1.0-2.5)
30.	The Happy Birthday Present (Harper--An I Can Read Book)	Fry Spache Wheeler-S.	1(1.5) 2.1 2(2.5)	1(1.5) 1.7 2(2.5)	P-1(1.0-1.5) 1.7-2.7 1-2(1.5-2.5)	.6 1.1 1.1	E (1.0-2.5)
31.	Here Comes the Strikeout (Harper-- A Sports I Can Read)	Fry Spache Wheeler-S.	1(1.5) 2.5 1(1.5)	1(1.5) 2.4 1(1.5)	P-1(1.0-1.5) 2.0-2.9 All 1(1.5)	.6 1.0 0	K-3 (1.0-3.5)
32.	Hidden Animals (Harper--A Science I Can Read)	Fry Spache Wheeler-S.	3(3.5) 3.1 2(2.5)	2(2.5) 2.4 2(2.5)	2-4(2.5-4.5) 2.4-3.7 2-3(2.5-3.5)	2.1 1.4 1.1	K-3 (1.0-3.5)
33.	The Homework Caper (Harper--An I Can Read Mystery)	Fry Spache Wheeler-S.	1(1.5) 2.4 2(2.5)	1(1.5) 2.6 1(1.5)	1-2(1.5-2.5) 1.9-2.7 1-2(1.5-2.5)	1.1 .9 1.1	E (1.0-2.5)
34.	How to Make Flibbers etc. (Random--Be- ginner Books)	Fry Spache Wheeler-S.	1(1.5) 2.4 1(1.5)	1(1.5) 2.7 P(1.0)	All 1(1.5) 2.2-2.7 P-1(1.0-1.5)	0 .6 .6	1-3 (1.5-3.5)

TABLE 12--Continued

	Title and Series	Formula	Mean Readability Estimate	First Sample Subscore	Range Limits	Range	CC Grading
35.	Indian Summer (Harper--An I Can Read History)	Fry Spache Wheeler-S.	1(1.5) 3.1 2(2.5)	1(1.5) 2.7 2(2.5)	1-2(1.5-2.5) 2.5-3.8 All 2(2.5)	1.1 1.4 0	1-3 (1.5-3.5)
36.	Johnny Lion's Book (Harper--An I Can Read Book)	Fry Spache Wheeler-S.	1(1.5) 2.2 3(3.5)	1(1.5) 2.3 3(3.5)	1-2(1.5-2.5) 1.8-2.7 2-3(2.5-3.5)	1.1 1.0 1.1	E (1.0-2.5)
37.	Kick, Pass and Run (Harper--A Sports I Can Read)	Fry Spache Wheeler-S.	1(1.5) 2.1 P(1.0)	1(1.5) 1.8 P(1.0)	All 1(1.5) 1.7-2.5 P-1(1.0-1.5)	0 .9 .6	1-3 (1.5-3.5)
38.	A Kiss for Little Bear (Harper--An I Can Read Book)	Fry Spache Wheeler-S.	1(1.5) 2.0 P(1.0)	1(1.5) 1.8 P(1.0)	All 1(1.5) 1.8-2.3 P-1(1.0-1.5)	0 .6 .6	E (1.0-2.5)
39.	Last One Home is a Green Pig (Harper--An I Can Read Book)	Fry Spache Wheeler-S.	1(1.5) 2.0 P(1.0)	1(1.5) 1.9 P(1.0)	P-1(1.0-1.5) 1.6-2.5 All P(1.0)	.6 1.0 0	E (1.0-2.5)
40.	Last One in is a Rotten Egg (Harper--A Sports I Can Read)	Fry Spache Wheeler-S.	1(1.5) 2.3 2(2.5)	1(1.5) 2.2 2(.25)	P-1(1.0-1.5) 1.9-2.8 1-2(1.5-2.5)	.6 1.0 1.1	K-3 (1.0-3.5)
41.	Let's Get Turtles (Harper--A Science I Can Read)	Fry Spache Wheeler-S.	1(1.5) 2.3 2(2.5)	1(1.5) 1.9 2(2.5)	P-4(1.0-4.5) 1.9-3.0 2-3(2.5-3.5)	3.6 1.2 1.1	E (1.0-2.5)

TABLE 12--Continued

	Title and Series	Formula	Mean Readability Estimate	First Sample Subscore	Range Limits	Range	CC Grading
42.	Little Bear (Harper--An I Can Read Book)	Fry	1(1.5)	P(1.0)	P-2(1.0-2.5)	1.6	E (1.0-2.5)
		Spache	2.2	1.7	1.7-2.8	1.2	
		Wheeler-S.	2(2.5)	1(1.5)	1-2(1.5-2.5)	1.1	
43.	Little Black, A Pony (Random--Beginner Books)	Fry	1(1.5)	P(1.0)	P-1(1.0-1.5)	.6	E (1.0-2.5)
		Spache	1.8	1.7	1.6-2.0	.5	
		Wheeler-S.	P(1.0)	P(1.0)	All P(1.0)	0	
44.	Little Runner of the Longhouse (Harper--An I Can Read Book)	Fry	1(1.5)	1(1.5)	1-2(1.5-2.5)	1.1	E (1.0-2.5)
		Spache	2.6	2.5	2.3-3.3	1.1	
		Wheeler-S.	3(3.5)	3(3.5)	2-3(2.5-3.5)	1.1	
45.	Magic Secrets (Harper--An I Can Read Book)	Fry	2(2.5)	2(2.5)	1-4(1.5-4.5)	3.1	1-3 (1.5-3.5)
		Spache	2.8	2.5	2.5-3.2	.8	
		Wheeler-S.	2(2.5)	2(2.5)	1-2(1.5-2.5)	1.1	
46.	No Funny Business (Harper--An I Can Read Book)	Fry	1(1.5)	1(1.5)	P-1(1.0-1.5)	.6	E (1.0-2.5)
		Spache	2.0	2.0	1.5-2.9	1.5	
		Wheeler-S.	1(1.5)	1(1.5)	P-1(1.0-1.5)	.6	
47.	Nobody Listens to Andrew (Follett--Beginning to Read)	Fry	1(1.5)	1(1.5)	All 1(1.5)	0	E (1.0-2.5)
		Spache	2.2	2.0	2.0-2.4	.5	
		Wheeler-S.	2(2.5)	2(2.5)	1 sample, no range		
48.	Oliver (Harper--An I Can Read Book)	Fry	2(2.5)	3(3.5)	1-3(1.5-3.5)	2.1	E (1.0-2.5)
		Spache	2.4	1.9	1.9-2.7	.9	
		Wheeler-S.	2(2.5)	2(2.5)	All 2(2.5)	0	

TABLE 12--Continued

Title and Series	Formula	Mean Read-ability Estimate	First Sample Subscore	Range Limits	Range	CC Grading
49. The One Bad Thing About Father (Harper--An I Can Read History)	Fry Spache Wheeler-S.	2(2.5) 3.2 3(3.5)	2(2.5) 3.4 3(3.5)	1-5(1.5-5.5) 2.4-3.7 3-4(3.5-4.5)	4.1 1.4 1.1	K-3 (1.0-3.5)
50. Oscar Otter (Harper--An I Can Read Book)	Fry Spache Wheeler-S.	2(2.5) 3.0 2(2.5)	3(3.5) 3.0 2(2.5)	2-3(2.5-3.5) 2.7-3.4 All 2(2.5)	1.1 .8 0	E (1.0-2.5)
51. The Penguins Are Coming (Harper--A Science I Can Read	Fry Spache Wheeler-S.	2(2.5) 3.1 2(2.5)	2(2.5) 3.1 2(2.5)	1-3(1.5-3.5) 2.6-3.8 All 2(2.5)	2.1 1.3 0	K-3 (1.0-3.5)
52. A Picture For Harold's Room (Harper--An I Can Read Book)	Fry Spache Wheeler-S.	1(1.5) 2.8 2(2.5)	1(1.5) 2.7 2(2.5)	1-2(1.5-2.5) 2.5-3.1 All 2(2.5)	1.1 .7 0	E (1.0-2.5)
53. The Pig War (Harper--An I Can Read History)	Fry Spache Wheeler-S.	2(2.5) 2.7 2(2.5)	3(3.5) 2.9 2(2.5)	1-3(1.5-3.5) 2.3-3.0 All 2(2.5)	2.1 .8 0	K-2 (1.0-2.5)
54. Plants to Grow In-doors (Follett--Beginning Science Books)	Fry Spache Wheeler-S.	2(2.5) 2.7 2(2.5)	2(2.5) 3.0 1(1.5)	1-3(1.5-3.5) 2.2-3.0 1-2(1.5-2.5)	2.1 .9 1.1	2-3 (2.5-3.5)
55. Plenty of Fish (Harper--A Science I Can Read)	Fry Spache Wheeler-S.	1(1.5) 2.3 2(2.5)	1(1.5) 2.2 2(2.5)	1-2(1.5-2.5) 1.9-2.9 All 2(2.5)	1.1 1.1 0	K-2 (1.0-2.5)

TABLE 12--Continued

Title and Series	Formula	Mean Readability Estimate	First Sample Subscore	Range Limits	Range	CC Grading
56. Prove It! (Harper-- A Science I Can Read	Fry Spache Wheeler-S.	1(1.5) 2.5 1(1.5)	1(1.5) 2.8 1(1.5)	1-2(1.5-2.5) 2.1-3.1 All 1(1.5)	1.1 1.1 0	K-3 (1.0-3.5)
57. Put Me in the Zoo (Random--Beginner Books)	Fry Spache Wheeler-S.	P(1.0) 1.7 P(1.0)	P(1.0) 1.6 P(1.0)	All P(1.0) 1.6-1.8 All P(1.0)	0 .3 0	E (1.0-2.5)
58. Red Fox and His Canoe (Harper--An I Can Read Book)	Fry Spache Wheeler-S.	1(1.5) 2.7 1(1.5)	2(2.5) 2.3 1(1.5)	1-2(1.5-2.5) 2.3-3.3 P-2(1.0-2.5)	1.1 1.1 1.6	E (1.0-2.5)
59. Red Tag Comes Back (Harper--A Science I Can Read)	Fry Spache Wheeler-S.	1(1.5) 2.0 P(1.0)	1(1.5) 2.2 1(1.5)	P-1(1.0-1.5) 1.8-2.3 P-1(1.0-1.5)	.6 .6 .6	K-2 (1.0-2.5)
60. Sam the Minuteman (Harper--An I Can Read History)	Fry Spache Wheeler-S.	2(2.5) 3.0 2(2.5)	3(3.5) 3.5 3(3.5)	1-3(1.5-3.5) 2.7-3.5 2-3(2.5-3.5)	2.1 .9 1.1	E (1.0-2.5)
61. Sammy the Seal (Harper--An I Can Read Book)	Fry Spache Wheeler-S.	1(1.5) 2.2 1(1.5)	1(1.5) 2.1 1(1.5)	All 1(1.5) 1.9-2.6 1-2(1.5-2.5)	0 .8 1.1	E (1.0-2.5)
62. The Secret Three (Harper--An I Can Book)	Fry Spache Wheeler-S.	1(1.5) 2.6 2(2.5)	1(1.5) 2.3 2(2.5)	P-3(1.0-3.5) 2.2-3.0 All 2(2.5)	2.6 .9 0	E (1.0-2.5)

TABLE 12--Continued

Title and Series	Formula	Mean Read-ability Estimate	First Sample Subscore	Range Limits	Range	CC Grading
63. The Several Tricks of Edgar Dolphin (Harper--An I Can Read Book)	Fry Spache Wheeler-S.	2(2.5) 3.0 2(2.5)	2(2.5) 2.9 1(1.5)	1-5(1.5-5.5) 2.7-4.0 1-2(1.5-2.5)	4.1 1.4 1.1	E (1.0-2.5)
64. Small Pig (Harper--An I Can Read Book)	Fry Spache Wheeler-S.	2(2.5) 2.9 2(2.5)	2(2.5) 3.1 2(2.5)	1-3(1.5-3.5) 2.6-3.1 All 2(2.5)	2.1 .6 0	E (1.0-2.5)
65. Spooky Tricks (Harper--An I Can Read Book)	Fry Spache Wheeler-S.	1(1.5) 2.9 2(2.5)	1(1.5) 3.1 2(2.5)	1-2(1.5-2.5) 2.4-3.5 1-2(1.5-2.5)	1.1 1.2 1.1	1-3 (1.5-3.5)
66. Stanley (Harper--An I Can Read Book)	Fry Spache Wheeler-S.	1(1.5) 2.5 2(2.5)	1(1.5) 2.6 2(2.5)	1-2(1.5-2.5) 2.1-2.8 1-2(1.5-2.5)	1.1 .8 1.1	E (1.0-2.5)
67. Stop That Ball! (Random--Beginner Books)	Fry Spache Wheeler-S.	P(1.0) 2.1 P(1.0)	P(1.0) 1.9 P(1.0)	P-1(1.0-1.5) 1.9-2.4 All P(1.0)	.6 .6 0	E (1.0-2.5)
68. The Strange Disappearance of Arthur Cluck (Harper--An I Can Read Mystery)	Fry Spache Wheeler-S.	1(1.5) 2.7 2(2.5)	2(2.5) 3.0 2(2.5)	1-2(1.5-2.5) 2.2-3.7 1-2(1.5-2.5)	1.1 1.6 1.1	E (1.0-2.5)
69. Tell Me Some More (Harper--An I Can Read Book)	Fry Spache Wheeler-S.	1(1.5) 2.5 2(2.5)	1(1.5) 2.2 2(2.5)	P-2(1.0-2.5) 2.0-3.8 All 2(2.5)	1.6 1.9 0	E (1.0-2.5)

TABLE 12--Continued

	Title and Series	Formula	Mean Readability Estimate	First Sample Subscore	Range Limits	Range	CC Grading
70.	Terry and the Caterpillars (Harper--A Science I Can Read)	Fry Spache Wheeler-S.	2(2.5) 2.4 2(2.5)	2(2.5) 2.0 2(2.5)	1-3(1.5-3.5) 2.0-2.7 All 2(2.5)	2.1 .8 0	K-2 (1.0-2.5)
71.	This is the House Where Jack Lives (Harper--An I Can Read Book)	Fry Spache Wheeler-S.	P(1.0) 1.8 P(1.0)	P(1.0) 1.6 P(1.0)	All P(1.0) 1.6-1.9 All P(1.0)	0 .4 0	K-2 (1.0-2.5)
72.	Tiny's Big Umbrella (Houghton--Read-by-yourself Books)	Fry Spache Wheeler-S.	1(1.5) 2.2 2(2.5)	1(1.5) 2.1 2(2.5)	P-2(1.0-2.5) 1.8-3.3 1-2(1.5-2.5)	1.6 1.6 1.1	E (1.0-2.5)
73.	Toad Hunt (Harper--A Science I Can Read)	Fry Spache Wheeler-S.	2(2.5) 3.1 3(3.5)	1(1.5) 2.7 2(2.5)	1-3(1.5-3.5) 2.3-4.0 2-3(2.5-3.5)	2.1 1.8 1.1	E (1.0-2.5)
74.	Tony's Birds (Harper--A Science I Can Read)	Fry Spache Wheeler-S.	1(1.5) 2.3 1(1.5)	1(1.5) 1.9 1(1.5)	P-2(1.0-2.5) 1.9-2.8 All 1(1.5)	1.6 .9 0	K-2 (1.0-2.5)
75.	Truck Drivers--What Do They Do? (Harper--An I Can Read Book)	Fry Spache Wheeler-S.	1(1.5) 3.1 2(2.5)	1(1.5) 2.5 2(2.5)	1-3(1.5-3.5) 2.5-3.5 All 2(2.5)	2.1 1.1 0	K-2 (1.0-2.5)
76.	What Have I Got (Harper--Early I Can Read Book)	Fry Spache Wheeler-S.	P(1.0) 1.9 P(1.0)	P(1.0) 1.6 P(1.0)	All P(1.0) 1.6-2.1 All P(1.0)	0 .6 0	E (1.0-2.5)

TABLE 12--Continued

Title and Series	Formula	Mean Readability Estimate	First Sample Subscore	Range Limits	Range	CC Grading
77. What Spot (Harper--	Fry	1(1.5)	1(1.5)	1-3(1.5-3.5)	2.1	E
An I Can Read Book)	Spache	2.3	2.4	1.9-2.8	1.0	(1.0-2.5)
	Wheeler-S.	2(2.5)	2(2.5)	All 2(2.5)	0	
78. When An Animal Grows	Fry	2(2.5)	3(3.5)	1-6(1.5-6.5)	5.1	K-2
(Harper--A Science	Spache	2.8	2.9	2.2-3.5	1.4	(1.0-2.5)
I Can Read)	Wheeler-S.	2(2.5)	2(2.5)	All 2(2.5)	0	
79. Wolfie (Harper--A	Fry	1(1.5)	1(1.5)	1-2(1.5-2.5)	1.1	K-3
Science I Can Read)	Spache	2.7	2.5	2.1-3.2	1.2	(1.0-3.5)
	Wheeler-S.	2(2.5)	2(2.5)	All 2(2.5)	0	

*Numbers assigned for mathematical purposes are placed in parenthesis. All P and below scores, K, or E are given a 1.0 grading, 1st = 1.5, 2nd = 2.5, etc.

**Data based on 88 words instead of 100.