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Abstract

The "Books for Young Adults 1974 Honor Listing" and the "1975 BYA Book Poll" are reading lists compiled by students participating in the University of Iowa's Books for Young Adults Program. There are no readability levels included. Three readability formulas, Dale-Chall, Flesch, and Fry formulas, were applied to the books on these lists. Each formula is based upon a 100 word sample The number of samples varies according to the formula that was used. Using the three formulas, the results showed that sixty-nine percent of the books fell within the readability levels of grades five through twelve. Forty-one percent of the books tested had a mean readability of 5-6. Fifty-two percent of the books tested did not vary from the mean grade more than plus or minus one grade level.

READABILITY ESTIMATES OF
"BOOKS FOR YOUNG ADULTS 1974 HONOR LISTING"
AND THE "1975 BYA BOOK POLL"

A Research Paper

Presented to the

Faculty of the Library Science Department

_____

In partial Fulfillment
of the Requirements for the Degree
Master of Arts

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Linda Fischer

June 1, 1977

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Read and approved by

Gerald Hodges

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Elizabeth Martin

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Accepted by Department

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Date *June 6, 1977*
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ABSTRACT

The "Books for Young Adults 1974 Honor Listing" and
the "1975 BYA Book Poll" are reading lists compiled by students
participating in the University of Iowa's Books for Young
Adults Program. There are no readability levels included.
Three readability formulas, Dale-Chall, Flesch, and Fry
formulas, were applied to the books on these lists. Each
formula is based upon a 100 word sample. The number of
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five through twelve. Forty-one percent of the books tested
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books tested did not vary from the mean grade more than
plus or minus one grade level.

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Chapter 1

THE PROBLEM

Introduction

The concern for readability is not completely a new idea. As early as 900 A.D., the Talmudists, the only literate people of their day, were concerned with word and idea counts. In modern times, the first serious concern for readability was by educators in 1840. They were interested in the ability of students to easily understand the vocabulary in the McGuffey Readers.[1]

The first work on a readability formula was done in 1898 by F. W. Kaeding. His work may not have been considered a formula, because he was only concerned with word count, but an attempt had been made to determine readability.[2]

Probably the biggest boost to the development of formulas was the publication of The Teacher's Word Book by E. L. Thorndike in 1921. Thorndike's publication led the way for Bertha A. Lively and S. L. Pressey to develop their formula. Most authorities considered their formula to be the first readability formula. They based it on the vocabulary difficulty of 1000 sample words selected systematically throughout a book.[3]

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[1]Georg R. Klare, The Measurement of Readability (Ames: Iowa State University Press, 1963), p. 44.

[2]Ibid., p. 30.   [3]Ibid.

The first validation study on Lively and Pressey's formula was done by Carleton Washburne and Mabel Vogel. They took the formula and used it along with the Stanford Achievement Test. They obtained a .80 correlation and were able to determine grade level of reading material by using the Stanford test.[4]

During the 1920's, other formulas were developed, but all were concerned primarily with the readability of children's books. It was not until librarians began to ask for readable materials for adults that any effort was made to determine the readability of adult materials.

In 1934, Ralph Ojemann set out to determine

> reading ability among adults; the factors most closely associated with reading difficulty; and the characteristics of materials at various levels of difficulty.[5]

His study dealt with three factors; sentence factors, vocabulary factors, and qualitative factors, all containing criteria developed by him. Other studies followed Ojemann in determining readability for adult materials.[6]

The development of formulas most familiar and often used today was not until 1938. Readability experts were trying, during this time, to simplify the older formulas which often took three hours or more to apply.

In 1939, Irving Lorge developed his formula. The

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[4]Ibid., p. 38.   [5]Ibid., p. 44

[6]Ibid., p. 53.

formula was based on "efficiency as a major basis for the retention or rejection of formula elements."[7] Lorge's formula dealt with three factors; sentence length, prepositional phrases, and word count. Because of the ease of applying his formula, it was widely used in areas outside of education.[8]

Another popular and much used formula was developed by Rudolf Flesch in 1943. His formula was based on the readability of adult magazines. The popularity of his formula was due to its ease and simplicity. His formula also dealt with three factors; sentence length, number of affixes, and number of personal references. Flesch brought his formula to public attention by publicizing it with educators, journalists, businessmen, and government officials. Flesch's formula is widely used today and has been revised several times.[9]

According to Klare,[10] the Flesch formula ranks number one as most frequently used. The second most frequently used formula is the one developed by Edgar Dale and Jeanne Chall in 1948. Their formula was a revision of the Flesch formula and it was based on only two factors; sentence length, and percentage of words not included in the Dale list of 3,000. In 1948, Edgar Dale developed the list of 3,000 for use with his formula. He tested fourth grade students on their knowledge of ten thousand words taken from Thorndike,

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[7]Ibid., p. 53.   [8]Ibid.

[9]Ibid., p. 56.   [10]Ibid., p. 59.

Buckingham, Dolch and other word lists. A word was considered to be known when eighty percent of the fourth graders knew the word. This formula was intended primarily for use with adult materials.[11]

Other formulas followed, but again these formulas were attempts to revise existing formulas or they were attempts to determine readability levels for children's materials, and are not within the scope of this study.

Edward Fry developed his formula in 1968. It was an attempt to simplify the time-consuming formulas of others. His formula was based on two factors; number of sentences and number of syllables in a one hundred word sample. His formula correlated highly with the Dale-Chall and Flesch formulas.[12]

Statement of the problem

This study was conducted to determine the reading level of books contained on the list of "Books for Young Adults 1974 Honor Listing"[13] and the "1975 BYA Book Poll"[14]

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[11]Edgar Dale and Jeanne S. Chall, "A Formula for Predicting Readability." Educational Research Bulletin 27 (January 21, 1948). p. 16.

[12]Edward Fry, "A Readability Formula That Saves Time." Journal of Reading 11 (April, 1968). p. 516.

[13]G. Robert Carlsen, Tony Manna and Betty Lou Tucker, "Books for Young Adults 1974 Honor Listing." English Journal 64 (January, 1975). p. 112.

[14]G. Robert Carlsen, Tony Manna and Jan Yoder, "1975 BYA Book Poll." English Journal 65 (January, 1976). p. 95-99.

when the Dale-Chall, Flesch, and Fry readability formulas were applied.

Until 1975, the list was entitled "Books for Young Adults Honor Listing." In 1975, the title was changed to "BYA Book Poll," but the criteria were the same. The listing is compiled each year by students participating in the University of Iowa's Books for Young Adults Program, Cooperating Schools Systems. The books included are recommended by the National Council of Teachers of English. The purpose of the list is to help teachers and media specialists in choosing books of interest to young people. "The aim of this listing is not to include all notable books,...., but to note the ones which proved most popular with our readers."[15] There are no readability levels given in the annotated listings.

Hypotheses

Since the materials included in the lists had been chosen by high school students, this researcher assumed that the readability levels would be representative of reading abilities within that group.

In 1975, Beverly Brown conducted a similar study using Booklist's "Best of the Best, 1970-75" recommended reading list. She applied the Dale-Chall, Flesch, and Fry formulas to the books on that list and found that readability ranged from grades two through sixteen. She also found that

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[15]G. Robert Carlsen, Tony Manna and Betty Lou Tucker, "Books for Young Adults 1974 Honor Listing," English Journal 64 (January, 1975). p. 112.

sixty-six percent of the books had a readability level between grades five through twelve.[16]

Based on the findings of Brown, the following hypothesis was tested. Since the materials were read by high school students, sixty-seven percent of the readability levels were expected to fall between grades five through twelve.

Joseph Vaughan's 1976 study, cited in the literature review, indicated that the Dale-Chall and Fry formulas correlated at .89. He found that grade levels were within plus or minus one grade level in eighty-five percent of the passages tested.[17] Therefore, based on Vaughan's study, the estimates of the formulas were not expected to vary from the mean grade level more than plus or minus one grade level in eighty-five percent of the passages tested.

Significance of the study

Library media specialists and teachers often rely on published lists in making their selections. Many lists in periodicals such as Booklist, School Library Journal, English Journal and others contain annotations and possibly interest levels, but readability levels are seldom given.

This researcher hoped that the results of this study could be used by media specialists and teachers who would be

[16]Beverly Brown, "Readability Estimates of the 'Best of the Best, 1970-75.'" (unpublished research paper, University of Northern Iowa, 1976). p. 18.

17Joseph L.J. Vaughan, "Interpreting Readability Assessments." Journal of Reading 19 (May, 1976). p. 636.

interested in obtaining readability levels for these lists.

Limitations of the study

This study was limited to only those books found
on the "Books for Young Adults 1974 Honor Listing" and the
"1975 BYA Book Poll." The study was also limited to the
availability of the books on the lists. This researcher
obtained the books through the University of Northern Iowa's
library, surrounding libraries, book stores, and through the
I-LITE network. The list contained the book I'm Somebody
Important; Young Black Voices from Rural Georgia which was
reviewed as a photographic essay and would not lend itself
to a readability test. Poems by Richard Thomas, included
on the 1975 listing also would not lend itself to a read-
ability test because a one hundred word sample was required.
The results of this study could not be generalized to other
lists.

This study was also limited to the Dale-Chall, Flesch
and Fry readability formulas and to the individual limitations
that each of these formulas impose. These limitations are
cited under the discussion of each formula.

Definitions

For the purpose of this study, the term readability
formula was defined as a "method of measurement intended as
a predictive device."[18]

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

The term readability was difficult to define. Dif-
ferent authors had used different meanings. For this study
readability was defined as "the ease of understanding due
to the style of writing."[19]

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[19]Ibid.

Chapter 2

REVIEW OF LITERATURE

The search for related literature on the subject of
readability and the development of readability formulas
produced studies that were conducted beginning in the late
1940's through 1976.

In 1947, Jeanne Chall examined readability in general.
She traced the development of readability formulas and was
concerned with bringing the issue of readability before the
public when she stated:

> If we want the public to be informed, either we
> have to find some way of increasing everyone's reading
> ability to the levels of the available books, or we
> must find some way of writing certain books and other
> materials so that they can be understood by all readers.[20]

Edgar Dale joined Jeanne Chall early in 1948 to
discuss their new formula for predicting readability. They
had used their formula with newspapers and concluded that
the Wall Street Journal was the most readable newspaper.
They tested the following three hypotheses with their formula.

> First, a larger word list would predict as well
> as, if not better than, the count of affixes. It
> would avoid the pitfalls of lack of discrimination

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[20]Jeanne S. Chall. "This Business of Readability."
Educational Research Bulletin 26 (January 15, 1947). p. 1-2.

at the upper levels of difficulty.
        Second, a count of personal references does not
add much to the prediction of readability.
        Third, a shorter, more efficient formula could
be evolved with the use of a word factor and a factor
of sentence length.[21]

The results indicated that the hypotheses were valid.[22]

Rudolf Flesch introduced a revised formula in 1948.
His formula was somewhat different from the Dale-Chall
formula in that it measured affixes and references to people.
Dale and Chall had considered these as shortcomings in a
readability formula. Flesch's formula was relatively easy
to apply and did have a high correlation with the Dale-Chall
formula.[23]

A study by Patricia Hayes, James Jenkins, and Bradley
Walker in 1950 examined the reliability of the Flesch formula.
They found that the formula had a high rate of reliability
and that since Flesch's revision of the formula, it was
easier to apply.[24]

In 1951, David H. Russell and Henry R. Fea applied six
formulas to twelve books to test the validity of the formulas.

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[21]Edgar Dale and Jeanne S. Chall. "A Formula for
Predicting Readability." Educational Research Bulletin 27
(January 21, 1948). p. 15.

[22]Ibid.

[23]Rudolf Flesch. "A New Readability Yardstick."
Journal of Applied Psychology 32 (June, 1948). p. 221.

[24]Patricia M. Hayes, James J. Jenkins, and Bradley
j. Walker. "Reliability of the Flesch Readability Formula."
Journal of Applied Psychology 34 (February, 1950). p. 22.

Their study dealt with juvenile fiction. They found that the Dale-Chall formula had the highest correlation with the other six formulas. The Dale-Chall, Flesch, and Yoakam formulas were found to be the easiest to apply.[25]

In 1956, Jeanne Chall conducted two studies. In the first study, she pointed out different studies that needed to be conducted on the subject of readability. She determined that more evidence was needed to determine grade placement of textbooks. Also studies that use more than one formula need to devise a way of computing the results so that they can be understood in relation with each other. Her third finding was that more validation studies are needed at the upper readability levels.[26] In her other study, she conducted a survey among people who have used the Dale-Chall formula. She found that when more than one formula was used, the Flesch formula was most often used in conjunction with the Dale-Chall formula. She also was able to identify several weaknesses of the formula, such as the word list, broad grade level designations, and not being applicable to books below the fourth grade.[27]

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[25]David H. Russell and Henry R. Fea. "Validity of Six Readability Formulas as Measures of Juvenile Fiction." The Elementary School Journal 52 (September, 1951). p. 136.

[26]Jeanne S. Chall. "This Business of Readability: A Second Look." Educational Research Bulletin 35 (April 11, 1956). p. 89.

[27]Jeanne S. Chall. "A Survey of Users of the Dale-Chall Formula." Educational Research Bulletin 35 (November 14, 1956). p. 197.

The study conducted by Niel Snotum found that the Flesch formula was more efficient than the Dale-Chall formula. The Flesch formula took less time to apply than did the Dale-Chall formula.[28]

All of the studies discussed until now have dealt with formulas that were devised in the 1940's and 1950's. The next major formula was developed in 1968. Developing a readability graph that would save time for the user was the prime concern of Edward Fry. In 1968, he developed the Fry graph which is based on two factors, number of sentences in on hundred words and number of syllables in one hundred words. He found that his formula correlated well with the Dale-Chall and the Flesch formulas.[29]

Mary Gaver and Edward Fry wrote a two-part article in 1969 explaining the benefits that a librarian could gain from the use of Fry's graph.[30] Gaver had good success in using Fry's graph to determine the readability of books for inclusion in her work on The Elementary School Library Collection. As Fry pointed out, "giving students books that are above their readability level will quickly turn them into

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[28]Niel K. Snotum. "Readability Re-examined." Journal of Communication 14 (September, 1964). p. 136.

[29]Edward Fry. "A Readability Formula That Saves Time." Journal of Reading 11 (April, 1968). p. 513.

[30]Edward Fry. "A Readability Graph for Librarians, Part I." School Libraries 19 (Fall, 1969). p. 23.

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

non-users of the library."[32]

Walter Pauk compared the Fry and Dale-Chall formulas. He found that both formulas work well together when applied to the same list because they both rely upon sentence length. He pointed out the time factor when employing these two formulas. The Fry formula takes approximately ten minutes to apply, while the Dale-Chall formula takes approximately forty minutes.[33]

Anthony V. Manzo presented a negative attitude toward readability formulas. He felt that readability formulas did not account for materials with a specialized vocabulary. His conclusion was stated as "readability formulae are of limited value; there is probably nothing that can be done with them that cannot be done equally well without them."[34]

Allen Blair's article discussed some of the short-comings of formulas. He found that short sentences lower readability and that formulas do not measure

> contextual difficulty, abstractness of ideas, density of ideas, reader interest, style appeal, how material is organized, whether material is interesting to look at, size of type, length of line, spacing, kind of ink and paper.[35]

[32]Edward Fry. "A Readability Graph for Librarians, Part I." <u>School Libraries</u> 19 (Fall, 1969). p. 16.

[33]Walter Pauk. "A Practical Note on Readability Formulas." <u>Journal of Reading</u> 13 (December, 1969). p. 207.

[34]Anthony V. Manzo. "Readability: A Postscript." Elementary English 47 (November, 1970). p. 963.

[35]Allen M. Blair. "Everything You Always Wanted to Know About Readability but Were Afraid to Ask." <u>Elementary English</u> 48 (May, 1971). p. 442.

He found that "word lists and formulas aren't absolutes- and they don't pretend to be. They are probability statements."[36]

By 1971, Karl Koenke determined that thirty one readability formulas existed. The same elements that are not measured in formulas as discussed by Blair were also discussed by Koenke. He felt that the Dale-Chall formula was difficult to apply in three ways.

1. vocabulary estimate is complicated
2. the definition of a word is complicated
3. the calculations confuse and probably frighten some potential users.[37]

In 1971, George R. Klare reviewed formulas that had been developed since 1960. The article gave advantages and disadvantages of various formulas. He determined that the way to tell whether a piece of writing is readable to a certain group of people is "to guess. A second solution- particularly suitable when a precise index of readability is needed, is a test. Readability formulas have come to provide a third possible solution to the problem."[38]

The article written by Joseph Vaughan compared the Dale-Chall and Fry formulas. He found that the two formulas had a correlation of .89. He also stated that

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[36]Ibid.

[37]Karl Koenke. "Another Practical Note on Readability Formulas." Journal of Reading 15 (December, 1971). p. 207.

[38]George R. Klare. "Assessing Readability." Reading 10 (1974-1975). p. 64.

In fifty instances, these formulas rated the
material exactly the same. In fifteen cases, the
Fry score was one grade level above the Dale-Chall;
in nine cases, the Fry score was one grade level
below. Thus, out of eighty-seven passages, Fry and
Dale-Chall were in agreement or within one grade
level of agreement in seventy four instances.[39]

In 1976, Beverly Brown did a study using the Dale-

Chall, Flesch, and Fry formulas. She applied these formulas

to fifty three book included on Booklist's "Best of the

Best, 1970-75" recommended reading list. That list is

similar to the one that will be used for this study. The

books are recommended for young adults. She found that the

readability of the selected books ranged from grade two

to grade sixteen and that the Dale-Chall and Fry results

were very similar while the Flesch score rated books higher.[40]

The literature review gave this researcher information

on readability in general. Formulas have improved from the

first ones that were devised. Directions have been revised

to make them clearer. The amount of time required to apply

a formula has improved. The Dale-Chall formula takes approx-

imately forty minutes, while the Fry formula is the shortest

taking approximately ten minutes. The fact that formulas

are often based on similar factors such as number of sentences

in a sample, and number of syllables in a sample was also

noted. Previous studies indicated that the three formula

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[39]Joseph L.J. Vaughan. "Interpreting Readability
Assessments." Journal of Reading 19 (May, 1976). p. 636.

[40]Beverly Brown. "Readability Estimates of the 'Best
of the Best, 1970-75.'" (unpublished research paper,
University of Northern Iowa, 1976). p. 18.

chosen for this study, Dale-Chall, Flesch, and Fry, seemed to yield approximately the same results when applied to the same list of materials. From the findings of the various studies, this researcher determined the formulas that were used in this study.

Chapter 3

METHODOLOGY

The literature indicated that the Dale-Chall, Flesch, and Fry formulas coordinated well together. Therefore, for the purpose of this study these three formulas were applied to samples taken from books on the "Books for Young Adults 1974 Honor Listing" (see appendix A) and the "1975 BYA Book Poll" (see appendix B) recommended by the National Council of Teachers of English and young adults in the University of Iowa's study. The lists contained new books most often read and appreciated by young adults. The lists were compiled by the students in the Books for Young Adults program The manner in which this researcher obtained the books on these lists was discussed under limitations on page seven.

The Dale-Chall formula is based on two factors, average sentence length and percentage of unfamiliar words not found on the Dale list of 3000 words. The following procedure as outlined by Dale and Chall was used. A sample of 100 words was taken from every tenth page of the book. The sample began with the first full paragraph on each tenth page and ended at the end of the sentence containing the one hundredth word. The total number of words in the sample was counted. Hyphenated words, contractions, numbers, compound names of persons and places, and initials which are

part of a name were counted as one word. The number of complete sentences in each sample was counted along with the number of words that were not included on the Dale list.[41]

All regular plurals and possessives of words on the list were considered as familiar. Irregular plurals were not counted on the list even if the singular form appeared on the list. Nouns that were formed by adding -er or -r to a noun or verb were considered as unfamiliar. Names of persons, places, organizations and documents were considered as familiar. Abbreviations were counted as one word in the sample and on the list. Verbs that were formed by adding -s, -ing, -n, -ed, or -ied were considered as familiar if the third person singular form was found on the list. Both comparative and superlative forms of adjectives were considered as familiar if the adjective was included on the list. Adverbs were considered as familiar if an -ly was added to an adjective on the list. Hyphenated wrds were considered as unfamiliar unless both parts of the word were on the list.[42]

There were several limitations to be considered in the use of this formula. The word list did not take into consideration any specialized vocabulary that may be contained in the sample. Many of the newer technological words such as

[41]Edgar Dale and Jeanne S. Chall. "A Formula for Predicting Readability." Educational Research Bulletin 28 (February 18, 1948). p. 37-38.
[42]Ibid., p. 40-41.

"television" known by fourth grade students today were not
included on the list of 3000. Results from the formula
placed readability estimates into broad grade levels.
Finally, the formula may not be appropriate to books below
the fourth grade because the 1948 word list is based on fourth
grade knowledge. Even though there are numerous limitations
to the formula, George R. Klare state in 1963 that "the
most accurate formula is the Dale-Chall. It is consistently
more accurate than others in comparison, though sometimes
only slightly so."[43]

The second formula that was used in this study was
the Flesch readability formula. The same sampling pattern
as used for the Dale-Chall formula was applied to the Flesch
formula. The sample ended at the one hundredth word. Numbers,
symbols, contractions, and hyphenated words were counted as
one word. The number of sentences in each sample was counted.
The number of words in all samples was totaled and divided
by the total number of sentences in all samples. The average
word length in syllables was determined by counting all
syllables and dividing by the number of words. The following
formula was then applied:

> Multiply the average sentence length by 1.015.
> Multiply the number of syllables per 100 words
> by .846.
> Add.

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[43]George R. Klare. The Measurement of Readability
(Ames: Iowa State University Press, 1963). p. 22.

Subtract this sum from 206.835.[44]
A chart was used to determine the reading ease score. This score was then transformed into grade levels (see appendix C).[45]

Consideration of the following limitations must be noted. Grade levels that are given become broader as the reading difficulty rises. Books rated lower than fourth grade cannot be measured on this scale.[46]

The final formula to be applied was the Fry readability formula. This formula offered a distinct advantage in that it was less time consuming to apply than either of the other two.

Only three samples were needed and these were selected from the beginning, middle and end of the book. The first sample of one hundred words was selected starting with the first paragraph on the tenth page. All proper nouns were skipped. The second sample was selected from the first paragraph on the middle page of the book, and the last sample was selected form the first paragraph on the tenth page from the end of the book.

The total number of sentences in each sample was

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[44]Rudolph Flesch. How to Test Readability. New York:Harper & Brothers 1951. p. 4

[45]Ibid., p.5,44.

[46]Ibid., p. 44

counted and these were averaged. The number of syllables in each one hundred word sample was counted and averaged. On the Fry graph, (see appendix D) the average number of sentences was plotted against the average number of syllables to find the readability grade level.

The Fry formula has the following limitations: sample passages containing a great amount of dialog tend to lower the grade level; books may not fall within the graph if they are written in an uneven style; several additional samples may need to be tested to determine this.[47]

Recording sheets used in this study when applying the three formulas are found in appendixes E, F, and G.

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[47]Edward Fry. "A Readability Formula that Saves Time." Journal of Reading 11 (April, 1968). p. 513.

Chapter 4

RESULTS AND CONCLUSIONS

The readability levels for sixty-three of sixty-
seven books on the "Books for Young Adults 1974 Honor List-
ing" and the "1975 BYA Book Poll" are displayed on Table 1,
pages 26-29. The table also indicates the mean readability
and the difference from the mean for each formula.

The table shows that forty-four of the sixty-three
books or sixty-nine percent of the books fall within read-
ability levels of grades five through twelve. Nineteen of
the sixty-three books or thirty percent of the books have
a readability level below the fifth grade. Therefore, the
hypothesis that sixty-seven percent of the books would fall
within the readability levels of grades five through twelve
is not rejected.

Since the two lists are intended for use by high
school students, the results indicate that the lists are
applicable to high school students. One must realize that
all high school students do not read at the high school level;
therefore, since the readability ranged from grades 2 through
12, the media specialist or user should consider that the
lists may be of value as lists of high interest and low
readability. Twenty-six of the sixty-three books or forty-
one percent of the books tested had a mean readability of 5-6.

This finding suggests that the high school students who compiled this list were most comfortable reading at the 5-6 readability level. The Dale-Chall formula rated forty-eight books at the 5-6 readability level; the Flesch formula rated thirty-four books at the 5-6 readability level; and the Fry formula rated twenty-five books at the 5-6 level.

The table also shows that of the sixty-three books, thirty-three were within the limits of the second hypothesis which stated that the estimates were not expected to vary from the mean grade more than plus or minus one grade level in eighty-five percent of the tested passages. Since only fifty-two percent fell within the range, this hypothesis is rejected. The range of difference from the mean varied from no difference to 3.2.

Klare has stated that the Dale-Chall formula is the most accurate.[48] Table 1 indicates this by showing that the Dale-Chall formula was the same as the mean readability in twelve cases. In two cases, the Fry formula was the same as the mean readability and in no cases was the Flesch formula equal to the mean readability. By comparing mean readabilities the Dale-Chall formula is the most accurate.

In thirty cases, the Flesch formula rated the readability score the same as the Dale-Chall formula. The Fry formula yielded the same results as the Dale-Chall formula

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[48] George R. Klare. The Measurement of Readability (Ames: Iowa State University Press, 1963). p. 22.

in twenty-four cases. This researcher concluded that the
Dale-Chall formula is the most accurate of the three. The
Flesch formula is the second most accurate of the three and
the Fry formula is the least accurate.

Since the readability levels of these books are only
an estimation, the media specialist and teacher using them
must take this into consideration. The user must also be
aware of interest level. Without Barbarians is rated as
second grade level, but the book may be too difficult for
second graders to comprehend and enjoy. Therefore, the
teacher and media specialist using readability formulas must
also take into consideration the interest level of the book.
Without Barbarians is rated at the 5-6 readability level for
the Dale-Chall formula, and at the 6 readability level for
the Flesch formula. The Dale-Chall score often seems to
fall somewhere between the Flesch and Fry scores.

Other interesting conclusions can be noted from the
table. Journey to Ixtlan and Ward 402 both had the highest
readability using only the Flesch formula while Sunshine and
Without Barbarians both had the lowest readability of grade
two using only the Fry formula.

Eighteen of the sixty-three books, or twenty-eight
percent had the same readability level on all formulas. Most
of these fell within the 5-6 readability level. This would
indicate that high school students are most comfortable read-
ing at this level. The maximum range among formulas was eight
grade levels. Journey to Ixtlan yielded a 4 using the Fry

formula and a 12 using the Flesch formula.

The Fry formula was the easiest and quickest to apply. This formula needed only three one hundred word samples and took approximately five minutes to apply. The Flesch formula took approximately fifty minutes to apply. Sentences and syllables were counted in one hundred word samples and the results were then applied in a formula. The Dale-Chall formula took approximately eighty minutes to apply. Consulting the Dale list of 3000 took a considerable amount of time at the beginning of the study, but as this researcher became more familiar with the list, the time decreased to approximately sixty minutes.

Readability estimates should be considered as one factor in selecting materials, but these estimates are certainly not the only selection criteria. The interest level of materials must also be determined by the media specialist and the teacheer. The "Books for Young Adults 1974 Honor Listing" and the "1975 BYA Book Poll" are lists of books which are of interest to high school students but generally have a low readability score when the above three formulas were applied.

Table 1

Readability Estimates of
"Books for Young Adults 1974 Honor Listing"
and the "1975 BYA Book Poll"
Using the Dale-Chall, Flesch, and Fry
Readability Formulas

TITLE	Mean Read-ability	Dale-Chall		Flesch		Fry		High	Low
		Read-ability	Dif-ference	Read-ability	Dif-ference	Read-ability	Dif-ference		
Alive	8	5-6	2.5	8-9	0.5	10	2.0	10	5
All Things Bright and Beautiful	6.8	5-6	1.3	7	0.2	8	3.2	8	5
As We Are Now	5.5	5-6	1.3	6	0.5	5	-0.5	6	5
The Chocolate War	6	5-6	0.5	6-7	0.5	6	0.0	7	5
Christie Malry's Own Double Entry	7	5-6	1.5	8-9	1.5	NA	NA	9	5
A Cry of Angels	6.2	7-8	0.7	7	0.8	4	-2.2	8	4
Didn't Anybody Know my Wife	5.5	5-6	0.0	6	0.5	5	-0.5	6	5
Down a Dark Hall	5.2	5-6	-0.3	6	0.8	4	-1.2	6	4
Dutch Uncle	5.8	5-6	0.3	6	0.2	6	0.2	6	5
Ellen	7.7	7-8	0.2	8-9	0.8	7	-0.7	9	7
Eric	4.8	5-6	0.7	6	1.2	3	-1.8	6	3
Exclusive	7.5	5-6	2.0	7	-0.5	10	2.3	10	5
Fair Day and Another Step Begun	5.5	5-6	0.0	6	0.5	5	-0.5	6	5
Fairy Tale	6.8	7-8	0.7	7	0.2	6	-0.8	8	6
The Falling Man	6.2	5-6	0.7	7	0.8	6	-0.2	7	5

Table 1 (con't)

Title	Mean Readability	Dale-Chall		Flesch		Fry		High	Low
		Readability	Difference	Readability	Difference	Readability	Difference		
Feral	4	4	0.0	5	1.0	3	-1.0	5	3
The Gift	6.8	5-6	1.3	7	0.2	8	1.2	8	5
Glimpses of the Beyond	7.3	5-6	1.8	8-9	1.2	8	0.7	9	5
A Hero Ain't Nothin' but a Sandwich	5.5	7-8	2	6	0.5	3	-2.5	8	3
Helter Skelter	8.3	7-8	2	8-9	0.2	9	0.7	9	7
The Honorary Consul	6.5	5-6	1.0	7	0.5	7	0.5	7	5
House of Stairs	5.8	5-6	0.3	6	0.2	6	0.2	6	5
If Beale Street Could Talk	5.2	5-6	0.2	6	0.8	4	-1.2	6	4
Indians' Summer	6.8	5-6	-1.3	7	0.2	8	1.2	8	5
Is That You Miss Blue	5.5	5-6	0.0	7	1.5	4	-1.5	7	4
Jack the Bear	6.5	5-6	-1.0	6	-0.5	8	1.5	8	5
Jaws	5.2	5-6	0.3	5	-0.2	5	-0.2	6	5
Joshua, Son of None	6.5	5-6	-1.0	7	0.5	7	0.5	7	5
Journey to Ixtlan	6.8	5-6	-1.3	10-12	4.2	4	-2.5	12	4
Kingdom Come	4.6	4.0	-0.6	6	1.4	4	-0.6	6	4
The Little Girl Who Lives Down the Lane	5.5	5-6	0.0	6	0.5	5	-0.5	6	5
Loophole or "How To Rob a Bank	5.8	5-6	0.3	6	0.2	6	0.2	6	5
Marathon Man	8.2	7-8	-0.7	7	-1.2	10	1.8	10	7

Table 1 (con't)

Title	Mean Read-ability	Dale-Chall		Flesch		Fry		High	Low
		Read-ability	Dif-ference	Read-ability	Dif-feremce	Read-ability	Dif-ference		
Mary Dove	5.8	5-6	-0.3	6	0.2	6	0.2	6	5
The Memory of Old Jack	6.5	5-6	-1.0	7	0.5	7	0.5	7	5
Nella Waits	5.8	5-6	0.3	6	0.2	6	0.2	6	5
None of the Above	5.0	4	-1.0	6	1.0	5	0.0	6	4
Not Comin' Home to You	5.5	5-6	0.0	6	0.5	5	-0.5	6	5
Of Love and Death and Other Journeys	5.2	5-6	0.3	6	0.8	4	-1.2	6	4
The Physicians	6.8	7-8	0.7	7	0.2	6	-0.8	8	6
The Princess Bride	5.8	7-8	1.7	6	0.2	4	-1.8	8	4
Representing Superdoll	4.8	5-6	0.7	6	1.2	3	-1.8	6	3
Richie	7.3	5-6	-1.8	8-9	1.2	8	0.7	9	5
Rockspring	5.5	5-6	0.0	6	0.5	5	-0.5	6	5
The Search for Joseph Tully	6.2	5-6	-0.7	7	0.8	6	-0.2	7	5
The Sentinel	7.2	5-6	-1.7	7	-0.2	9	1.8	9	5
Serpico	6.2	5-6	-0.7	6	-0.2	7	0.8	7	5
Somebody's Sister	6.2	5-6	-0.7	7	0.8	6	-0.2	7	5
The Son of Someone Famous	6.2	5-6	-0.7	6	-0.2	7	0.8	7	5
Spindrift	6.7	7-8	0.8	8-9	1.8	4	-2.7	9	4
A Sporting Proposition	5.8	5-6	-0.3	7	1.2	5	-0.8	7	5

Table 1 (con't)

Title	Mean Read-ability	Dale-Chall Read-ability	Dale-Chall Dif-ference	Flesch Read-ability	Flesch Dif-ference	Fry Read-ability	Fry Dif-ference	High	Low
The Summer Before	6.2	5-6	-0.7	6	-0.2	7	0.8	7	5
Sunshine	4.2	5-6	1.3	5	0.8	2	-2.2	6	2
The Taking of Pelham 1,2,3,	6.8	7-8	0.7	7	0.2	6	-0.8	8	6
Theodore Jonathan Wainwright Is Going to Bomb the Pentagon	4.7	4	-0.7	6	1.3	4	-0.7	6	4
Theophilus North	5.5	5-6	0.0	6	0.5	5	-0.5	6	5
The Thirteenth Trick	5.5	5-6	0.0	7	1.5	4	-1.5	7	4
Transport 7-41-R	5.8	5-6	-0.3	6	0.2	6	0.2	6	5
Trying Hard to Hear You	4.0	4	0.0	5	1.0	3	-1.0	5	3
Uncle Herschel, Dr. Padilsky and the Evil Eye	5.5	5-6	0.0	6	0.5	5	-0.5	6	5
Ward 402	7.8	5-6	-2.3	10-12	3.2	7	-0.8	12	5
Without Barbarians	4.5	5-6	1.5	6	1.5	2	-2.5	6	2
You and Me, Babe	5.8	5-6	-0.3	6	0.2	6	0.2	6	5

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APPENDIX A

"Books For Young Adults 1974 Honor Listing"[49]

<u>Alive</u> by Piers Paul Reed.

<u>As We Are Now</u> by May Sarton.

<u>The Chocolate War</u> by Robert Cormier

<u>Christie Malry's Own Double-Entry</u> by B.S. Johnson.

<u>Dutch Uncle</u> by Marilyn Durham.

<u>Fairy Tale</u> by Eric Segal.

<u>The Falling Man</u> by Warren Forma.

<u>The Gift</u> by Pete Hamill.

<u>A Hero Ain't Nothin' But A Sandwich</u> by Alice Childress.

<u>The Honorary Consul</u> by Graham Greene.

<u>I'm Somebody Important</u> by George Mitchell.

<u>Joshua, Son of None</u> by Nancy Freedman.

<u>Journey to Ixtlan</u> by Carlos Castaneda.

<u>Kingdom Come</u> by Gwen Davis.

<u>Let Me Hear You Whisper</u> by Paul Zindel.

<u>Loophole or "How to Rob a Bank"</u> by Robert Pollock.

<u>The Memory of Old Jack</u> by Wendel Berry.

<u>The Princess Bride</u> by William Goldman.

<u>Richie</u> by Thomas Thompson.

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[49]G. Robert Carlsen, Tony Manna, and Betty Lou Tucker, "Books for Young Adults 1974 Honor Listing," <u>English Journal</u> 64 (January, 1975). p. 112.

Revolutionary Suicide by Huey P. Newton.

Serpico by Peter Maas.

The Son of Someone Famous by M.E. Kerr.

A Sporting Proposition by James Aldridge.

The Summer Before by Patricia Windsor.

The Taking of Pelham One, Two, Three by John Godey.

Theodore Jonathan Wainwright is Going to Bomb the Pentagon by Louis Phillips.

Theophilus North by Thornton Wilder.

The Thirteenth Trick by Russell Braddon.

Uncle Herschel, Dr. Padilsky, and the Evil Eye by I.S. Young.

Ward 402 by Ronald Glasser, M.D.

APPENDIX B

"1975 BYA Book Poll"[50]

All Things Bright and Beautiful by James Herriot.

Caril by Patrick Trese.

A Cry of Angels by Jeff Fields.

Didn't Anybody Know My Wife by Willo Davis Roberts.

Down A Dark Hall by Lois Duncan.

Ellen by Rose Levit.

Eric by Doris Lund.

Exclusive by Marilyn Baker.

Fair Day, and Another Step Begun by Katie Lyle

Feral by Berton Roueche.

Glimpse of the Beyond by Jean-Baptiste Delacour.

Helter Skelter by Vincent Bugliosi.

House of Stairs by William Sleator.

If Beale Street Could Talk by James Baldwin.

Indians' Summer by Nasnaga.

Is That You, Miss Blue? by M.E. Kerr.

Jack the Bear by Dan McCall.

Jaws by Peter Benchley.

The Little Girl Who Lives Down the Lane by Laird Koenig.

Marathon Man by William Goldman.

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[50]G. Robert Carlsen, Tony Manna, and Jan Yoder. "1975 BYA Book Poll," English Journal, 65 (January, 1976). 95-99.

Mary Dove by Jane Gilmore Rushing.

Nella Waits by Marlys Millhiser.

None of the Above by Rosemary Wells.

Not Comin' Home to You by Paul Kavanagh.

Of Love and Death and Other Journeys by Isabelle Holland.

The Physicians by Henry Denker.

Poems by Richard Thomas.

Representing Superdoll by Richard Peck.

Rockspring by R.G. Voiet.

The Search for Joseph Tully by William H. Hallahan.

The Sentinal by Stanley Konvitz.

Somebody's Sister by Derek Marlowe.

Spindrift by Jan Bartell.

Sunshine by Norma Klein.

Transport 7-41-R by T. Degens.

Trying Hard to Hear You by Sandra Scoppettone.
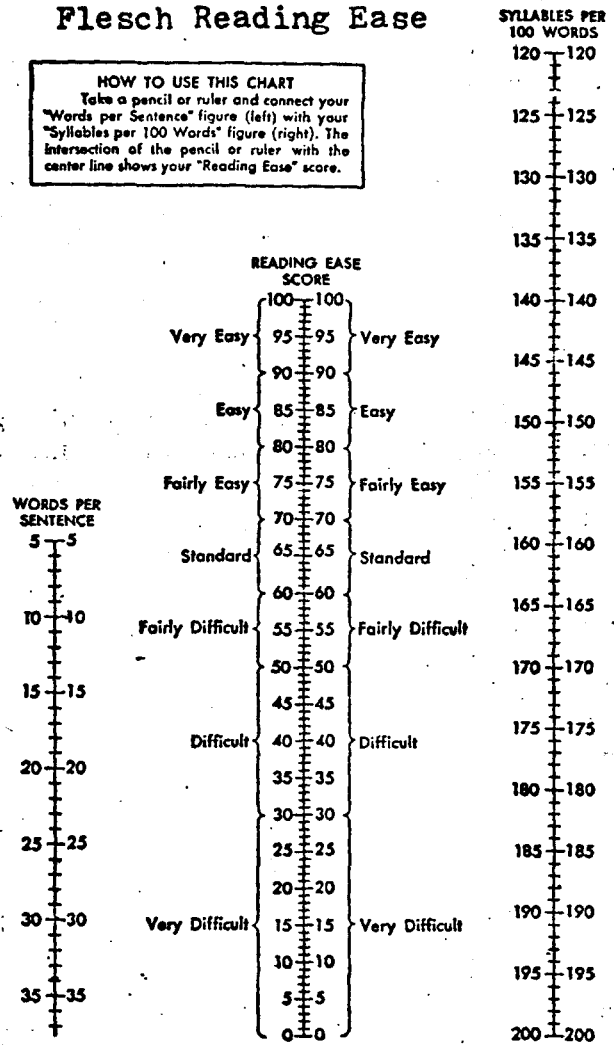
Without Barbarians by Jim Margnuson.

You and Me, Babe by Chuck Barris.

APPENDIX C

Flesch Reading Ease

SYLLABLES PER 100 WORDS

HOW TO USE THIS CHART
Take a pencil or ruler and connect your "Words per Sentence" figure (left) with your "Syllables per 100 Words" figure (right). The intersection of the pencil or ruler with the center line shows your "Reading Ease" score.

READING EASE SCORE

WORDS PER SENTENCE

Very Easy — 95 — Very Easy
Easy — 85 — Easy
Fairly Easy — 75 — Fairly Easy
Standard — 65 — Standard
Fairly Difficult — 55 — Fairly Difficult
Difficult — 40 — Difficult
Very Difficult — 15 — Very Difficult

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CONVERSION TABLE

Flesch Score	Grade Level
90 to 100	5th grade
80 to 90	6th grade
70 to 80	7th grade
60 to 70	8th and 9th grade
50 to 60	10th to 12th grade (high school)
30 to 50	13th to 16th grade (college)
0 to 30	College Graduate

APPENDIX D

GRAPH FOR ESTIMATING READABILITY
by Edward Fry, Rutgers University Reading Center, New Jersey
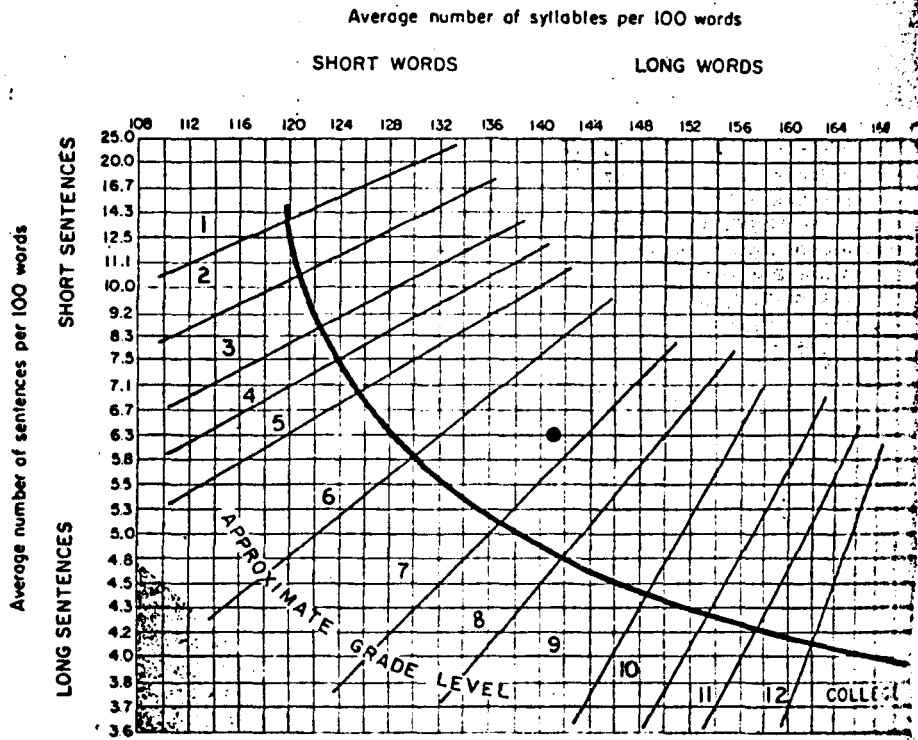
APPENDIX E

Application of the Dale-Chall Formula

Author: *Isabelle Holland*

Title: *Of Love and Death and Other Journeys*

Page #	6	16	26	36	46	56	66	76
Words	I — canvases	mother quitzer land	Peter - Florence	my - me	Darling growth	Im - trouble	Mark due	The - shawl
1. # of words	114	104	104	103	111	109	107	102
2. # of sentences	4	14	7	11	9	13	11	9
3. # of unfamiliar words	16	10	16	6	11	8	7	8
4. av. sent. length $1 \div 2$	28.5	7.4	14.9	9.4	12.3	8.4	9.7	11.3
5. Dale Score $3 \div 1 \times 100$	14.0	9.6	15.4	5.8	9.9	7.3	6.5	7.8
6. #4 x .0496	1.41	.37	.74	.47	.61	.42	.48	.56
7. #5 x .1579	2.21	1.52	2.43	.92	1.56	1.15	1.03	1.23
8. Constant = 3.6365	C	C	C	C	C	C	C	C
9. Raw Score (#6+#7+#8)	7.3	5.6	6.8	5.0	5.8	4.8	5.1	5.4

Average corrected grade level __5.6.__

APPENDIX E (continued)

Correction Table[51]

Formula Raw Score	Corrected Grade Levels
4.9 and below	4th grade and below
5.0 to 5.9	5-6th grade
6.0 to 6.9	7-8th grade
7.0 to 7.9	9-10th grade
8.0 to 8.9	11-12th grade
9.0 to 9.9	13-15th grade (college)
10.0 and above	16 (college graduate)

[51]Edgar Dale and Jeanne S. Chall, "A Formula for Predicting Readability:Instructions." Educational Research Bulletin, 27 (February, 1948). p. 42.

APPENDIX F

Application of the Flesch Formula

Author: *Isabelle Holland*

Title: *Of Dove and Death and Other Journeys*

Page #	7	17	27	37	47	57	67	77	87
1. # of words	100								
2. # of sentences	5.5	12.3	14.4	7	5	7.8	5.5	7	9.6
3. # of syllables	155	128	139	143	133	140	133	130	141

Sentence length = $\dfrac{\text{total \# words}}{\text{total \# sentences}}$ X 1.015   *11.83*

Word length = $\dfrac{\text{total \# syllables}}{\text{\# of samples}}$ X .846   *114.21*

Reading ease = 206.835 - word length - sentence length   *80.79*

Page #	97	107	117	127	137	147	157		
1. # of words	100								
2. # of sentences	5	11.3	5.5	10.1	8.2	NA	11.4		
3. # of syllables	137	130	145	125	132	NA	123		

APPENDIX G

Application of the Fry Formula

Author: *Isabelle Holland*

Title: *Of Love and Death and other Journeys*

Page #	17	80	149					
1. # of syllables	128	119	126					
2. # of sentences	4	14	6					

Average # of syllables _124_

Average # of sentences _8_

Reading level _4_