

3. The Error of Using Readability Formulas for Research and Practice: An Integrative Review of the Technical Communication and Accounting Literatures

Timothy D. Giles

PORTLAND COMMUNITY COLLEGE-SYLVANIA CAMPUS
GEORGIA SOUTHERN UNIVERSITY, PROFESSOR EMERITUS

Abstract: Because some U.S. government agencies have required documents to be written at a specific reading grade level, and Microsoft Word can be set to evaluate readability, readability formulas seem ensconced in the workplace. Given the formulas' limited variables, however, the Technical Communication (TC) literature has long evidenced resistance to readability formulas, especially to direct revision. Should readability formulas be included in TC research, or in the TC practitioner's toolkit? To address this conundrum, an integrative literature review analyzes readability formula discussion in the TC and Accounting literatures.

Keywords: Flesch Reading Ease, Flesch-Kincaid Reading Grade Level, McCall-Crabbs scores, Readability, Audience-appropriate texts

Readability formulas have been part of the technical communication (TC) landscape for almost 65 years (Docter, 1961), and in numerous articles, technical communicators have objected to applying the formulas to their work (Bruce et al., 1981; Carliner et al., 2023; Clark, 1975; Connaster, 1999; Davis, 1967; Docter, 1961; Giles, 1990; Hargis, 2000; Plung, 1981; Redish, 1981, 2000; Schriver, 2000; Stevens et al., 1992). As recently as 2023, in contemplating TC's past, Janice Redish championed developments in "user-centered focus, user-centered design, [and] usability testing" (as cited in Carliner et al., 2023) and dismissed readability formulas because they ignore "the person who's going to actually use the text." In support, Karen Schriver (2023) commented,

The most overrated development for technical communication is the inclusion of readability statistics in Microsoft's MS Word. Adding readability output to MS Word led many people to believe that running the Flesch or Kincaid formula would tell them if their document was understandable or not. . . many writers and even non-writers look to readability output as a kind of one-button

solution to understandability. But as research on usability has clearly shown, the output was really overrated in terms of what it told us about text quality. And here we are many years later still haunted by the same formula in Microsoft's Office 365. (as cited in Carliner et al., 2023)

The word "readability" in the phrase "readability formula" may be part of the problem. Generally, the idea of "readability" has a positive connotation for technical communicators. Christina M., a U.S. technical editor, noted, "Technical editors improve readability, by making sure the content has a consistent voice, tone, style, and format" (as cited in Henkin, 2023). Layout and document design are important facets of readability. As Nikki Arnell (2023) observed "viewers must be able to easily view the consistent chunks of information, or it will compromise readability." Denmark et al. (2022) advised, "write in plain English. Ninety percent of U.S. states have specific readability guidelines.... Content should not exceed a 3rd- to 8th-grade reading level, depending on the state," (p. 4) and "Measure readability (Flesch-Kincaid is generally accepted as the standard)" "Readability" emerges, then, as a TC motif and as it is reported in the review of the TC literature.

Because readability formulas seem widely accepted for use in TC, they might be useful for studying readability as part of TC theory. On using them, Moreno and Casasola (2016) posited that

although some concerns have been raised about readability formulas, this study uses an adapted version of the Flesch readability formula for comparability because it is the measure most widely applied by the accounting literature in general and studies of readability evolution in particular. (p. 205)

Thoms et al., (2020) acknowledged Redish (2000), who has repeatedly denied the dependability of formulas (Carliner et al., 2023; Redish, 1981); otherwise, Thoms et al. do not further delve into the TC readability literature, which suggests that, despite the formulas' drawbacks, using them as research tools can render meaningful insights that can contribute to the TC literature.

■ Research Problem

Though readability formulas seem ingrained in TC, they do not offer a useful evaluation. The Flesch Reading Ease and the Flesch-Kincaid formulas, for example, measure only the number of words per sentence and the number of syllables per word, rendering either a score on a scale of zero to one hundred, or a reading grade level, respectively. The Flesch Reading Ease's grounding in readability is from grade school children who were tested nearly 100 years ago, and the Flesch-Kincaid's is drawn from 1980s Navy personnel. Both formulas are available as a Microsoft Word tool setting.

That readability formulas are so widely used is problematic, especially when they become a part of the TC research methodology. Thoms et al. (2020) and Moreno and Casasola, (2016) study TC questions on readability drawn from Accounting, which has been studying and making use of readability formulas, usually with empirical studies, for as long as it has been a concern in TC. Is there something worthwhile that might emerge from examining this research that might benefit TC? This article explores that research to try to learn from it.

■ Background on Readability Formulas

Education scholars first developed readability formulas in the 19th century to determine appropriate reading materials for children. Russian scholar N. A. Rubakin evaluated readability to correlate with a 1500-familiar words vocabulary list (Klare, 1963). By 1898, F. W. Kaeding correlated the word count of a text with its readability. In the US, E. L. Thorndike catalogued words most frequently found in English texts, providing teachers insight into measuring difficulty, especially for new texts.

By the 1920s, the Vogel and Washburne Formula could evaluate 100-word samples, accounting for the numbers of different words, prepositions, words not on the Thorndike list, and simple sentences. These factors were then cast into a regression equation:

$$^X_1 = .085X_2 + .101X_3 + .604X_4 - .411X_5 + 17.43$$

This formula is credited as a precursor to Rudolph Flesch's (1948) formula:

$$\text{Reading Ease} = 206.835 - 846wl - 1.015sl$$

wl = word length (number of syllables per word)

sl = number of words per sentence in 100-word samples

Originally, the Flesch Reading Ease formula was applied to 100-word samples, which allowed it to be applied to longer works, such as books (Flesch, 1948, p. 225). The Flesch Reading Ease yields a score on a 0 to 100 scale: the higher the score, the more readable the text (p. 230).

Other formulas popularized after World War II still in use today include the Dale-Chall Formula (Dale & Chall, 1948a, 1948b), which was revised in 1995. The Dale-Chall formula drew upon 769 words common to Thorndike's list, another list from the International Kindergarten Union, and an 8000-word list familiar to 4th, 6th, and 8th grade students, expressed in this formula:

$$X_{c_{50}} = .1579X_1 + .0496X_2 + 3.6365$$

$X_{c_{50}}$ = reading score of a pupil who could answer one-half of the test questions correctly

X_1 = Dale score (relative number of words outside Dale list of 3000 words)

X_2 = average sentence length

3.6365 = constant (the point against which deviation and correlation are measured) (1948a, p. 18).

In 1981, J. Peter Kincaid published his revision of the Flesch Reading Ease. A version of it is available as part of Microsoft Word 365 (Microsoft, 2024) and renders a reading grade level using the same two variables from the Flesch Reading Ease:

Grade Level = 0.39 (Avg. No. Words/Sentence) + 11.8 (Avg. No. Syllables/Word) - 15.59 (Kincaid et al, 1981, p. 38).

The Flesch Reading Ease and the Flesch-Kincaid Reading Grade Level are widely available for a technical communicator's use. Not only can Microsoft Word easily be set to run the Flesch Reading Ease and the Flesch-Kincaid Reading Grade Level formulas, various web sites offer free readability assessments that only require the user to cut-and-paste text onto the site to receive the Dale-Chall, Flesch Reading Ease and Flesch-Kincaid Grade Level readability measures, among others (Readability formulas, n.d.).

Readability Formulas in the Technical Communication and Accounting Literatures

Studying readability questions in accounting is relevant to TC because the 2020–2021 *STC Salary Database's* “Ten Largest Job Gains For Technical Writers In 2020” ranked “Management of Companies and Enterprises” third among top-10 employers (2022, p. 26). A company's annual report for stockholders, then, might be written by a TC professional and could be part of the public relations specialist's purview as well (p. 25).

Some U.S. government agencies require documents to be evaluated with readability formulas. The U.S. Food and Drug Administration (2001) has recommended that patient-support materials be written at the eighth-grade level, which the Flesch-Kincaid Reading Grade Level formula, originally created for the U.S. Navy, supplies (Kincaid et al., 1981).

Research Questions

With this background in mind, we can pose these questions:

- Research Question One: Should readability formulas be part of a TC research methodology, when so many valid objections have been raised to their use, or has the ease of the application of readability formulas

ignored what otherwise does not belong in our professional toolbox, much less in research methodologies generating new knowledge in TC?

- Research Question Two: Because readability formulas have been a part of the Accounting literature longer than, and to a greater degree, than in TC, has TC missed something of value?

Research Methodology: The Integrative Literature Review

To explore readability and its meaning to TC, an integrative literature review can be useful, especially “when the knowledge base of a mature topic is larger and more diversified,” which is certainly the case after 65 years in both TC and Accounting, because it can “capture the dynamics and development of new knowledge on the topic by reviewing and critiquing the literature and then synthesizing knowledge in its current state through ... [its] reconceptualization” (Torraco, 2016, p. 409). Examining the references for Moreno and Casasola (2016) and Thoms et al. (2020) revealed that their inquiries are grounded in readability scholarship from the field of Accounting. Moreno and Casasola (2016), for example, cited 23 Accounting journals.

To access additional literature for TC and Accounting, the MLA, ProQuest (Accounting, Tax, and Banking Collection), and Business Source Complete databases were queried with the keywords “Readability Formula,” “Flesch” and Flesch Reading Ease.” These searches rendered 21 articles on readability as a TC issue and 24 in Accounting for review, as listed in Table 3.1:

Table 3.1. TC and Accounting Readability Researchers Reviewed

Technical Communication	Accounting
Arnell, 2023	Adelberg, 1979
Bruce, Rubin, & Starr, 1981	Clatworthy & Jones, 2001
Carliner, Redish & Schriver, 2023	Courtis, 1986, 1995, 1998, 2004
Cherry, 1982	Hongkang, et al., 2022
Clark, 1975	Hrasky et al., 2009
Connaster, 1999	Jones, 1988, 1997
Davis, 1967	Jones & Shoemaker, 1994
Denmark, Lippincott, & Morel, 2022	Lewis et al., 1986
Giles, 1990	Li, 2008
Hargis, 2000	Miller, 2010

Technical Communication	Accounting
Henkin, 2023	Pashalian & Crissy, 1952
Klare, 2000	Schroeder & Gibson, 1990
Longo, 2004	Smith et al., 2006
Moreno & Casasola, 2016	Smith & Taffler, 1992
Plung, 1981	Soper & Dolphin, 1964
Redish, 1981, 2000	Still, 1972
Schenck, 1977	Stone & Lodhia, 2019
Schrivver, 2000	Stone & Parker 2013
Spinuzzi & Zachry, 2000	Sydserff & Weetman, 1999
Thoms, Degenhart & Wohlgemuth, 2020	Tan et al., 2014

Additionally, the search included names of these scholars who appeared multiple times with forward and backward searches of their names as listed in Table 3.2:

Table 3.2. TC and Accounting Forward and Backward Name Searches

Accounting	TC
Clatworthy, M.	Redish, J.
Courtis, J.K.	Schrivver, K.
Jones, M.J.	
Shoemaker, P. A.	
Smith, M.	
Stone, G.	

Using the same search terms, five TC-focused journals were also searched because they have long been the major TC journals, which is important since this topic spans 65 years

- *IEEE Transactions on Professional Communication*
- *Journal of Business and Technical Communication*
- *Journal of Technical Writing and Communication*
- *Technical Communication*
- *Technical Communication Quarterly.*

Similarly, Ryan K. Boettger and Erin Friess (2020) surveyed these journals in their longitudinal content analysis, and so did Lisa Melonçon and Kirk St. Amant (2019) to study technical communication research methods in articles. After queries in both disciplines, relevant articles were analyzed according to their content and conclusions.

■ Findings

The literature review from the TC and the accounting literature answered the research questions:

- Research Question One: Should readability formulas be part of a TC research methodology, when so many valid objections have been raised to their use, or has the ease of the application of readability formulas ignored what otherwise does not belong in our professional toolbox, much less in research methodologies generating new knowledge in TC?
- Research Question Two: Because readability formulas have been a part of the Accounting literature longer than, and to a greater degree, than in TC, has TC missed something of value?

This study's first research question focuses on TC theory and research, and the second question relates to literature published in 21 Accounting journals. The results are organized with a discussion of TC literature and then of the Accounting literature.

■ Readability Formulas in the Technical Communication Literature

The TC literature demonstrates that technical communicators have resisted readability formulas, without any studies posing questions regarding readability set up in an experimental design. In fact, up until Moreno and Casasola (2016) and Thoms et al. (2020), TC scholars had not used readability formulas as part of their research methodology, perhaps because the resistance to their use has been so adamant. Instead, theoretical concerns with audience and comprehension emerged as dominant themes in the TC articles addressing readability formulas. As early as 1961, Stewart Docter asserted, “. . . technical writing is not, at least with the present formulas, a proper medium for the Flesch methods” (p. 91) because “our readers are human and do become bored and fatigued” (p. 96). After excoriating writing to please a formula, because to do so would be “to invite disaster,” Andrew K. Clark (1975) reminded the technical communicator “how important the *reader* is perceived to be in the communication process” (p. 69).

In the 1980s, technical communicators more actively resisted readability formulas, and the formulas do not appear in TC research methodologies. In 1981, *IEEE Transactions on Professional Communication* published, “Forum: Readability Formulas: Used or Abused?” It consisted of six articles (pp. 43–54) that the editor claimed to be “both pro and con, on the use of readability formulas” (p. 43), though most responders opposed the use of readability formulas. In this forum (1981), Redish noted that readability formulas cannot determine a text's relevance for an audience, citing Robert M. Gordon's (1980) study measuring Plato's *Parmenides* as appropriate for 4th- to 8th-grade students, according to the Dale-Chall and Fry formulas (pp. 47–48). Daniel L. Plung (1981) faulted readability formulas for

not considering audience: “All books on writing, expository and technical, agree that writing must be adapted to its intended audience. Yet readability formulas ignore this rule” (p. 53). Furthermore, he objected to being required to write for “people with extremely limited vocabularies and reading abilities” (p. 53).

As Plung suggested, comprehension continued to concern technical communicators. Bertram Bruce and his collaborators (1981) explained how writing to accommodate a readability formula could create miscomprehension if conjunctions indicating cause and effect, for example, are omitted to shorten a sentence, an edit to which readability formulas such as the Flesch Reading Ease and the Flesch-Kincaid Reading Grade Level respond favorably when the number of words per sentence is a variable: shorter sentences render a higher Flesch Reading Ease score (90 to 100 is evaluated as “very easy”), or a lower reading grade level for the Flesch-Kincaid.

Lawrence T. Frase (1981) argued readability formulas as an ethical lapse because, for a work to be readable, it should be comprehensible. However, the formulas’ variables are only peripherally related to comprehension, such as the correlation with the 1926 McCall-Crabbs Standard Test Lessons in reading from the original Flesch formulas.

■ Quantifying comprehension: The McCall-Crabbs correlation

On comprehension, Eleanor Schenck (1977) first questioned this serious methodological flaw with the Flesch Reading Ease, which cited a positive correlation of its scores with the McCall-Crabbs Standard Test Lessons in Reading as proof of comprehension. The correlations were drawn from question-comprehension scores based on passages that test takers (who were children) had read in 1926. These scores were correlated with the Flesch Reading Ease as well as other formulas developed at that time (Jacobson et al., 1978).

On comprehension, Flesch (1948) admitted that

For many obvious reasons, the grade level of children answering test questions is not the best criterion for general readability. Data about the ease and interests with which adults will read selected passages would be far better. But such data were not available at the time the first formula was developed, and they are still unavailable today. So McCall-Crabbs’ Standard test lessons are still the best and most extensive criterion that can be found; therefore they were used again for the revision. (pp. 222–223)

Though Flesch completed his PhD at Columbia University’s Readability Laboratory of the American Association of Adult Education in 1944, he did not choose to test his formula for comprehension on adults (Longo, 2004, p. 168), which is odd since after World War II, many veterans were attending college on the GI Bill. Schenck (1977) does not directly ask but infers the question of the

extent data from 1926 would be relevant to readers in 1948, when the Flesch and the Dale-Chall formulas were published, or in 1977, when Schenck published her article. Jacobson et al. (1978), who researched reading processes, concluded, after working with revising the McCall-Crabbs Standard Test Lessons, that “the McCall-Crabbs norms are out of date” and required revision (p. 229).

■ Introducing the Flesch-Kincaid Reading Grade Level Formula

J. Peter Kincaid’s Formula Reading Grade Level (1981) accounted for comprehension to some degree, but such an undertaking never occurred for the Flesch Reading Ease. The same March 1981 issue of *IEEE Transactions on Professional Communications*, with the previously cited readability forum, heralded the publication of what has come to be known as the Flesch-Kincaid Reading Grade Level formula: “a recalculation of the Flesch Reading Ease Formula developed by testing Navy enlisted personnel on their understanding of passages from Navy training manuals” (Kincaid et al., 1981, p. 38). For this formula, the variables remained the number of words per sentence and of syllables per word, with vocabulary lists included to quantify comprehension further, including the 1948 Dale-Chall List, plus three different lists particular to the military and one specifically from U.S. Navy training materials: “About 1,900 words common in Navy documents were identified by a computer frequency analysis of 240,000 words taken from two basic Navy training texts used in recruit training” and “a merged list of 4300 root words made up of three military word lists,” (Kincaid et al., p. 39). Kincaid used these variables, rather than updating the 1926 McCall-Crabbs grounding for reading scores to account for comprehension. Instead, he modeled his formula on the Dale-Chall Formula, which accounts for deviation from vocabulary lists. Those deviations are not supplied on the truncated version of the Flesch-Kincaid Reading Grade Level included with Microsoft Word, which uses the same variables but renders a reading grade level.

■ The Research Deficit

Though readability formulas lack research focused on adults, which Flesch readily admitted, the formulas lack research support for use in TC. To begin to address this void, Richard M. Davis (1967) experimented with headings, description, and visual aids in a study with more than 2300 subjects and concluded by lamenting that,

considering the rooms full of reports generated in the production of an automobile, the tons of paperwork developed in the building of a power plant, or the shelves full of manuals and other supporting documents necessary to maintain a single airplane, it is a little surprising . . . that there just does not seem to be much controlled experimentation aimed at determining how such things should best be written to fill their functions. (p. 38)

Today, such research emanates most frequently from universities, whose TC programs were only beginning as recently as the 1960s and 1970s. Tracing the development of academic programs in TC, Kenneth T. Rainey and Rebecca S. Kelly (1992) credited Rensselaer Polytechnic University for the first TC PhD program, beginning in 1965, with the first two dissertations completed in 1979. At Carnegie-Mellon University, the second oldest university offering a PhD in TC, no dissertations were completed there before the 1980s. Considering these dissertations, when Davis (1967) published his research related to TC and readability, only one dissertation per year related to TC had been written in 1965, 1969, and 1973, respectively, gradually increasing to 32 in 1988 and 31 in 1989. And though Rensselaer Polytechnic University is cited as the first technical communication PhD program, Rainey and Kelly (1992) credit the first PhD dissertation as Harold Burton Simpson's "A Descriptive Analysis of Scientific Writing," completed at the University of Michigan in 1965, with other early works completed at Columbia University (1969) and the University of Houston (1973), so very little TC research to support the study of readability was being conducted at universities.

■ Bell Labs and Writer's Workbench

Without support of TC research in universities, Bell Labs created Writer's Workbench, an evaluative software whose various iterations released in the 1970s and 1980s included the Flesch Reading Ease, the Flesch-Kincaid Reading Grade Level formula, and other formulas, as well as additional information for evaluation of writing, such as the number of words, length of sentences, percentage of verbs, and the percentage of active or passive voice, with vestiges of these programs still apparent in Microsoft Word 365's Editor. To introduce their research, Bell Labs researchers published articles in *IEEE Transactions on Professional Communications*. Two articles that can serve as examples are one by computer scientist Lorinda Cherry (1982) and another by four Bell Labs employees (Macdonald et al., 1982).

On writing, Cherry asserted, "For many people, writing is painful and editing one's own prose is difficult, tedious, and error-prone" (p. 100). Macdonald et al. (1982) assured their readers of the general agreement over what constitutes good writing, which they defined as grammatical correctness, correct spelling, and conciseness. From sources described as "disparate," they assimilated advice on writing from Walter Strunk and E. B. White, "who wrote notes for a college course" [*sic.*]; George R. Klare, "who wrote about the readability of a text"; and E. B. Coleman, "who empirically studied comprehension," which led them to assert these experts valued active voice, "short concrete words," and a verbal (rather than a nominal) style. In these two articles, Cherry (1982) and Macdonald et al. (1982) described various computer programs that constitute Bell's Writer's Workbench, which carried out tasks now taken for granted, ranging from tracking spelling errors and punctuation errors, or assessing word choice, or measuring

a passage's abstractness. Subsequent Bell Labs publications seemed similar to "complimentary copy," articles in trade magazines that claim to compare different products but are really advertisements, in this case for Writer's Work Bench (e.g., Coke & Koether, 1983; Frase, 1983). For technical communicators, the discussion about readability formulas decreased, with the title of one article declaring "Last Rites for Readability Formulas in Technical Communication" (Connaster, 1999).

■ Technical Communicators Respond

In 2000, another forum on readability formulas, this time in the *ACM Journal of Computer Documentation*, included a reprint of the first chapter from George R. Klare's *The Measurement of Readability* (1963), another response from George R. Klare (2000), and from IBM software engineer Gretchen Hargis (2000), readability researcher J. Redish (2000), TC researcher K. Schriver (2000), web designer K. Zibbel (2000), and TC researchers Clay Spinuzzi and Mark Zachry (2000). A resonant theme for the articles from TC scholars supported implementing usability studies to determine readability, and to support revision; audience and comprehension again emerged as the technical communicator's primary concerns. In the final article, Spinuzzi and Zachry (2000) allude to "genre ecology," encouraging technical communicators to work with readers to create meaning but not specifically addressing readability.

■ The Accounting Literature

The second research question for this study focuses on the Accounting literature, which dealt with Accounting concepts such as "obfuscation," typically an attempt to measure how less-readable text might obscure loss or other forms of dishonesty.

In Accounting, readability formulas began to be used only a few years after R. Flesch (1948) started promoting their application to adult reading materials, specifically professional documents (what we call business and technical communication today). In a 1950 issue of the *Journal of Applied Psychology*, Siroon Pashalian and William J. E. Crissy first recommended applying the Flesch Reading Ease to annual reports, using research from Pashalian's 1949 New York University master's thesis in psychology, "An Investigation of the Application of the New Flesch Readability Formulas to Corporate Annual Reports." Two years later, in *The Journal of Accountancy*, Pashalian and Crissy (1952) published an article that is in places verbatim to the *Journal of Applied Psychology* article. Because the 1952 article focused on applying readability to Accounting issues, specifically the readability of annual reports, it is the more relevant one referenced in this study. In this article, they recommended using the Flesch Reading Ease and the Flesch Human Interest score. Citing feedback from readers indicating "considerable apathy to company reports," they recommended applying the Flesch Reading Ease to improve how easily company reports can be read and comprehended (Pashalian &

Crissy, 1952, p. 244). Recognizing the difficulty of writing these reports, to provide “sufficient technical data and information for the financial expert,” they sought to accommodate a stockholder reading about a company’s yearly progress, its technological and scientific advancements, or both (p. 215).

Applying the Flesch Reading Ease and the Human Interest Rating formulas to the annual reports for companies cited by *Business Week’s* Corporate Billion-Dollar Club listing for June 11, 1949, Pashalian and Crissy (1952) learned that these reports’ scores ranged from 6 to 58 on the Flesch Reading Ease, which rates them as “very difficult” to “fairly difficult” on Flesch’s scale (p. 215–216). Flesch equated the “very difficult” category with “scientific” journals and “fairly difficult” with what he referred to as “Quality,” which rated as less difficult than “Academic” but more difficult than “Digests,” such as *Reader’s Digest* (Flesch, 1948, p. 230).

■ Accounting Responds

An Accounting scholar immediately supported Pashalian and Crissy (1952). John A. Beckett (1952), a former MIT Accounting Professor and practicing San Francisco accountant, wrote to the editor of *The Journal of Accountancy*, supporting the Flesch Reading Ease as “a step in the right direction” but recommending “further experimentation . . . if the method is to prove helpful to financial reporting . . . [I]t is hoped that the profession will use the best results—with imagination and judgment—toward the improvement of the art” (p. 547). Though Beckett called for testing, Accounting was not quick to explore readability formulas but did so before TC began to consider using them.

Fred J. Soper and Robert Dolphin (1964) appear to be credited with the next academic study of readability formulas. Replicating Pashalian and Crissy (1952), Soper and Dolphin (1964) evaluated annual reports according to the Flesch Reading Ease, citing Pashalian and Crissy (1952) and Pashalian’s master’s thesis (1949), from which her two articles with Crissy, a Queens College professor, were drawn. On the Flesch Reading Ease, they concluded it offers “a useful rating of reading ease for corporate annual reports” (p. 362), noting “the reading ease of corporate annual reports has not improved from 1948 to 1961, [and] reading ease is a vital factor in aiding comprehension of the corporate annual reports. . .” (p. 362). As a result, the Flesch Reading Ease emerged rendering the same fascination with evaluating readability formulas that sustains it to this day.

■ Ubiquity of the Flesch Reading Ease

The Accounting literature provides proof of the dominance of the Flesch Reading Ease, as many studies used readability formulas as a central tenet of their methodology in the 73 years after Pashalian and Crissy (1951). Generally, the 24 studies identified in this literature review sought to discover a relationship between readability and an Accounting theoretical concept such as “obfuscation,” which typically means to seek to determine deception, and if deception could be determined by a readability score.

In these studies, the Flesch Reading Ease and the Flesch-Kincaid Reading Grade Level were used more often than any other tool to evaluate readability. Its use eventually pointed to its ubiquity, which Accounting researchers Mark Clatworthy and Michael J. Jones (2001) supported, justifying it as a tool when they sought to determine if the middle of the annual reports were less readable for less-profitable companies, as John K. Curtis (1998) claimed. At this point in the Accounting literature, objections to the Flesch Reading Ease included its limited measure of readability, given the variables and its age, which included its comprehension correlations dating to the 1926 McCall-Crabbs scores, but instead, Clatworthy and Jones (2001) characterized it as resilient, and cited Curtis (1998) to affirm its “computational ease, understandability, and comparability” (p. 313). Clatworthy and Jones (2001) concluded by reminding readers that they aimed to address Curtis’ claims, not to test the Flesch Reading Ease as a method for evaluating comprehension.

Curtis (1998), for example, had sought to connect a corporation’s reported loss to a lower readability score. He sampled 120 companies on the Hong Kong Stock Exchange, with attention, in terms of profitability, to the top and bottom 30 companies. He asked if loss would be buried in the middle of an annual report, rather than signaled in the introduction, or included in the conclusion. To study overall readability, he applied the Flesch Reading Ease because it “has been the dominant choice of researchers, essentially because of its computational ease, general understandability, and comparability with other similar studies” (p. 2). He admitted as problematic that “validation studies . . . seem to be quite dated” (p. 2), which must mean the McCall-Crabbs scores since he references George R. Klare (1964). Here, Curtis (1998) does recommend that “Until an accounting researcher successfully correlates a readability formula score with a conventional reading comprehension test, there is a risk that these measures could be misleading” (p. 2). Curtis concluded by noting that they can provide a general idea of what they claim to measure, which is fine so long as too much judgement is not predicated upon them.

■ Discussion

Accounting has long used readability formulas for assessment. If Accounting had not used readability formulas to assess documents, perhaps the formulas would not be in Microsoft Word 365. Instead, the business world, and Accounting in particular, heed a rudimentary assessment of writing, especially for the annual report, as a convenient way to ignore and elide the time and expense required to correlate the score meaningfully with comprehension and through the study of usability.

Business and technical communicators then have four options for dealing with readability studies and readability tests:

- Push for user-experience studies to evaluate readability of documents;
- Endorse “big data” studies to refine readability tests and triangulate methods;

- Revise the Flesch Reading Ease and the Flesch-Kincaid Reading Grade Level Readability formulas;
- Wait for readability tests to fall into disuse.

■ Push for Usability Testing

Carliner et al. (2023) advocated for usability studies since they are more meaningful. What has kept usability testing from being more widely used is the time and expense that it calls for. However, to what extent have the post-COVID-19 technical advances of communication technologies, such as Zoom calls, been fully exploited? In other words, how might such technology decrease the amount of time it takes to set up and carry out usability studies? Such studies have not yet begun to emerge from TC theory.

■ Endorse “Big Data” Studies

Some Accounting researchers (e.g., Hongkang et al., 2021; Miller, 2010; Smith et al., 2006) have advocated correlating readability formulas with other variables. For example, to test the “obfuscation” hypothesis, Smith et al. (2006) examined the chair’s statement for 513 Malaysian companies, correlating the Flesch Reading Ease with the Bullfighter Composite Index, which measures readability by the amount of “corporate jargon,” because jargon is “likely to include potentially obfuscating terms and phrases” (p. 50). They correlated both scores with seven variables: “profitability,” “liquidity,” “total liabilities and assets,” size in terms of total assets, “number of administrative boards,” “PN [Pacific National] status,” and “industry group [consumer, industrial, or trading]” (p. 56). Despite such extensive data analysis, no significant support for the obfuscation hypothesis emerged.

Brian P. Miller (2010) correlated the Gunning Fog Index, the number of words in a document, and eighteen other variables to measure the readability of 10-K reports, which are required annually by the SEC and are intended to be more detailed than annual reports. Miller concluded that longer, more complicated 10-K reports were less likely to be read than the typically shorter annual reports, which negatively affected the ability of 10-K reports to generate sales.

Hongkang Xu and their collaborators (2021) sought a correlation between a local government’s political corruption and the readability of documents produced by those corporations that correspond geographically to those areas. They suspected that management of these companies would be more likely to write less readable reports. Examining 12,742 annual reports for 2369 different firms, from 2006–2014, they concluded that less readable reports were produced by such managers. Xu et al. (2021) see their work as contributing both to the obfuscation theme in accounting and political corruption and to

measuring its effect.

■ Revise the Flesch Reading Ease and the Flesch-Kincaid

If the Flesch Reading Ease is to continue to be used, its correlation with comprehension should be addressed, and its 1926 comprehension scores should be updated. Though the U.S. Navy version of the Reading Grade Level accounts for technical vocabulary and its deviation from vocabulary lists, the version of the Flesch-Kincaid Reading Grade Level available with Microsoft Word 365 does not feature any correlation with any vocabulary lists, or any other correlation with comprehension other than assigning a reading grade level.

On these issues, Gerard Stone and Leah D. Parker (2013) critiqued the Flesch Reading Ease, arguing the word length variable to be the least meaningful but without advocating for its removal because doing so would leave the Flesch Reading Ease's score ". . . unusable. Moreover, reducing the number of variables to predict readability arguably further limits the measure's utility," especially because the formula is weighted about 89% in favor of word length, leaving sentence length at only 11% (p. 43). Tweaking word- and sentence-length weightings would create problems with how prose measured in the past might correlate with these scores. Rather than accept these formulas for their influence on research, Gerard Stone and Sumit Lodhia (2019) instead favor being more audience-focused and valuing document design. From the Accounting literature, they valued what had been written about visual aids--especially tables, charts, headings, and subheadings--and recommend a model for what could become a formula to evaluate document layout and design. However, even if the Flesch Reading Ease, and the Flesch-Kincaid were revised, unless meaningful variables were identified, the Flesch Reading Ease, and the Flesch-Kincaid, would still be manipulating syllable and word counts.

■ Wait for Readability Tests to Fall Into Disuse

Readability formulas may indeed eventually fall into disuse: for example, word processors like Google Docs and Open Office do not provide readability formula evaluation. Many U.S. government agencies continue to require organizations that seek funding to write and revise, according to reading grade levels; for example, the FDA recommends that patient labeling be written at an eighth-grade level (U.S. Food and Drug Administration, 2001, p. 16). On the other hand, a document recommending the use of readability formulas on the Centers for Medicare & Medicaid Services web site (see Figure 3.1) was removed (U.S. Department of Health and Human Services Centers for Medicare & Medicaid Services, 2021) and replaced in 2023 (see Figure 3.2).

TOOLKIT for Making Written Material Clear and Effective		10
Table of contents		
SECTION 4		
Special topics for writing and design		
	Using readability formulas: A cautionary note	
Introduction		
	Background on the Toolkit	1
	What are “readability formulas”?	1
Reasons for caution		
	Why be cautious about using readability formulas?	4
	<i>Reason for caution 1:</i> Readability formulas ignore most factors that contribute to ease of reading and comprehension	5
	<i>Reason for caution 2:</i> Grade level scores tend to be unreliable	9
	<i>Reason for caution 3:</i> Grade level scores are less precise than they sound and prone to misinterpretation	12
	<i>Reason for caution 4:</i> Imposing a grade level requirement has the potential to do harm	14
Recommendations		
	Recommendations for using readability formulas	16
	<i>Recommendation 1:</i> Do not use readability formulas to assess overall suitability	17
	<i>Recommendation 2:</i> Pick your formula and method carefully	19
	<i>Recommendation 3:</i> Interpret reading grade level scores broadly as indicating a general range of difficulty	22
	<i>Recommendation 4:</i> Report grade level scores in ways that acknowledge their narrow scope and limitations	24
Instructions for using readability formulas		
	Instructions for using the Fry method	28
	Instructions for using the SMOG	35

Figure 3.1. From the Medicare & Medicaid ToolKit (U.S. Department of Health and Human Services Centers for Medicare & Medicaid Services, 2021)

Although Figure 3.1 advocates readability formulas, with reservations, Figure 3.2 does not mention them. The Fry “method” recommended in Figure 3.1 calculates a score based upon the same variables as the Flesch Reading Ease: the number of syllables per word and the number of words per sentence (Fry, 1968), and the SMOG index variables are another contortion of the number of syllables and sentence length, and includes the opportunity for the researcher to “Estimate the square root of the number of polysyllabic words counted” (McLaughlin, 1969, p. 639) Rather than sentence length, the placement of sentences in the document are accounted for. Either reflects more of a fascination, as Bernadette Longo (2004) has asserted, with mechanism and technique than with readability.

Guidelines for effective writing

Keep content meaningful & user-focused

Give users clear value.

Ask yourself: Is this content saying something meaningful or adding new information?

Get right to the point.

People have limited attention and patience and are quickly frustrated when expectations aren't met. As communicators, it's our job to help them get what they need quickly.

Delete fluff.

Too much unnecessary text leads to skipping. Users don't care about what your organization and programs are doing; they care about WHAT AFFECTS THEM. Eliminate promotional, redundant, outdated, and trivial copy.

Show, don't tell.

Language like "this page makes it easy for you to find helpful contacts" is unnecessary. If the page really makes it easy, it should be obvious.

Limit introductory text or instructions.

If we write clearly and concisely, the purpose and meaning should be obvious.

Limit sentence & page length

Keep sentences as short as you can — the shorter, the better.

Try to keep sentences to 20 words or less. Express one point per sentence. Put the most important information at the beginning. Remember audiences are scanning, not reading.

Paragraphs should be 2 or 3 sentences max.

Put the most important information first.

Tips for web pages.

Write content in independently meaningful chunks that make sense when taken out of context. Each content chunk should address just one issue. Readers overlook the second point when there are multiple items in a single chunk.

If your webpage requires scrolling, make sure there are headers and/or menus to help users find what they're looking for. Consider breaking up long text across multiple pages.

Figure 3.2. From the current Medicare & Medicaid Services Guidelines for effective writing (U.S. Department of Health and Human Services Centers for Medicare & Medicaid Services, 2023)

■ Plain Language?

Although it would be reasonable to expect the digital and print manifestations of the plain language guidelines put out by the U.S. General Services Administration to support usability studies and to criticize readability formulas, such a stance has been weak, at best, with, for example, the 2011 Plain Language Guidelines only devoting about ten pages to testing, and in fact obliquely supporting Rudolph Flesch (1979) by citing one of his later books on style. An interesting contrast may be found in the U.S. Security and Exchange Commission (SEC) produced *A Plain English Handbook: How to create clear SEC disclosure documents* (1998). This handbook, which is still available for purchase on Amazon, is likely to be read by an accountant and

includes a one-page chapter devoted to “Using Readability Formulas and Style Checkers.” There, on readability formulas, the U.S. SEC (1998) notes, “Take their suggestions as just that—suggestions. The final test of whether any piece of writing meets its goal of communicating information comes when humans read it” (1998, p. 57). Interestingly enough, the U.S. SEC’s guide for writing does not mention Rudolph Flesch’s work. The SEC supports, in another brief chapter, the use of “focus group testing” (1998, p. 59), which is helpful but needs to be updated to represent how much more is now known about, and through, usability testing.

■ Conclusion

The Flesch Reading Ease and the Flesch-Kincaid Reading Grade Level formulas, like all readability formulas, are flawed: they depend upon too few variables, and as we have seen, adding variables generally has not proven fruitful.

Problems with comprehension correlation plague the Flesch Reading Ease and the Flesch-Kincaid. The Flesch Reading Ease’s correlations are not only almost 100 years old but were based on data drawn from elementary school children. Surely reading abilities have changed since then, and better testing for usability, rather than readability, could be done with a cross-section of adults.

Tweaking the Flesch Reading Ease and Flesch-Kincaid’s formulas’ variables might seem more useful for the technical communicator. However, changes would require extensive testing, not only of the equation but also of comprehension. Fortunately, TC programs can be stimulated with corporate funding and, it is important to remember, despite the influence of artificial intelligence on writing, people will continue to read what technical communicators write and design. Testing and refining readability formulas could be done with “big data” approaches to support using the Flesch Reading Ease and the Flesch-Kincaid, but so far, correlating multiple variables in Accounting has not proven fruitful.

Technical communicators should acknowledge that the U.S. government’s support for readability formulas is beginning to wane, as at least one agency is starting to remove grade-level readability requirements. (see Figures 3.1 and 3.2.) Additionally, readability formulas are not part of Google Doc or Open Office, which writers use for collaborative writing.

Considering the challenges of testing and revising the scores and the waning of government, and software, interest in these formulas, it seems more prudent to wait. While TC waits, technical communicators and researchers should understand the limitations of readability formulas and protest their use to determine usability. Additionally, they should not be accepted as tools for research methods in TC studies, not when human subjects can provide more accurate data on the use of documents, both print and digital. As reading and writing abilities wax and wane as part of the effects of educational experiences disrupted by epidemic, weather catastrophes, digital media, or AI, we must be more than ever observant, and flexible, in our approaches to evaluating audiences.

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