

Designing a better readability formula

StyleWriter's Nick Wright, discusses the background behind developing his company's Bog Index.

I once presented a course to technical writers on the drafting of computer manuals. Unlike every other profession I taught, I didn't have to tell the technical writers to write shorter sentences. So I asked: 'Who taught you to write in short sentences?' No one knew. Their manager eventually piped up: 'They only write short sentences because they don't know many words.' A little harsh, but according to standard readability formulas — short sentences and a basic vocabulary is the ideal way to write clearly.

Readability formulas, such as Flesch-Kincaid or the Gunning Fog Index assess writing style by analysing a document's sentence length and the length of words. The shorter the sentences and the fewer syllables or characters in the words, the lower the score. Advocates of these formulas use this to work out the grade of education needed to understand the text. The lower the score or grade level the easier the writing style — or so the theory goes.

Back in the classroom, the technical writers had pages of short sentences — often disjointed — and always with a liberal sprinkling of acronyms, abbreviations, jargon and abstract words and passive verbs. Perfect according to the readability formulas; but confounding to their readers.

Designing the Bog Index

With the power of the modern computer, we can design a readability formula to assess many more features in writing than word and sentence length.

We've designed a new readability measure for our StyleWriter editing software — the **Bog Index** — so called because it measures how style can bog down writing. It's unique in analysing text against a graded 200,000-word dictionary, and in assessing style faults found by the StyleWriter program such as; redundant phrases, passive verbs and hidden verbs.

The Bog Index doesn't just measure poor writing habits but includes measures of good writing style — called **Pep** because these features pep up writing. Pep makes reading easier and more enjoyable and consists of lively verbs, interesting nouns, names and conversational style (contractions, personal pronouns, direct questions and short sentences).

StyleWriter's Bog Index measures sentence length, word choice, style problems and abbreviations. It then reduces the index depending on the Pep (good writing features) found in the text.

Adjusting the Bog Index by Writing Task and Audience

Clear, readable writing differs depending on the writing task and the audience. A medical paper read by scientists naturally uses more difficult words than a speech to the public. StyleWriter's Bog Index adjusts its scores and ratings depending on the writing task and audience chosen.

What makes the Bog Index better than standard readability formulas?

Readability formulas claim good writing is around US education eighth grade — that produced by 13-year-olds. Gunning, in 'The Technique of Clear Writing' states that the easy reading level is in the range of sixth to tenth grade and that 'anyone who writes with a Fog Index of more than [Grade] 12 is putting communication under a handicap and a needless handicap at that'. This doesn't mean writing should be like a 13-year-old's, but rather a 13-year-old can read and understand it. Insofar as it goes, this is reasonable advice, but there are problems.

In a survey of 50 different readability formulas on text independently assessed by teachers as suitable for different school grades, standard readability formulas:

- Predicted the correct grade in only 8 to 28 per cent of cases.
 - Had an average error between 1.5 to 3.8 grades.
 - Often produced errors of up to 6 grades.
- But even if readability formulas were accurate, they offer limited help to the writer because:
- They do not show writers where and how to edit.
 - They do not take into account the writing task and audience.
 - Writers often ignore a high grade level as claiming they are writing to an educated audience.
 - Good writing can have a higher grade level than poor writing.

Compare these two examples:

Management-speak

The ARP and AAR outputs were determined as part of the overall operational FSX needs. Management were then asked to oversee both ARP and AAR production with consideration being given to ARP and AAR in the annual accounts. The ongoing assessment of the above requirements is a necessity for ARP and also AAR production.

- Average sentence length 18,
- Flesch Reading Ease 47.5 (fairly difficult)

References

Gunning, R (1952)
The Technique of Clear Writing
 McGraw-Hill
 Wright, N (2010)
 Towards a better readability measure – the Bog index,
www.editorsoftware.com/StyleWriter.html#apm1_3

$$\text{Bog Index} = \text{Sentence Bog} + \text{Word Bog} - \text{Pep}$$

$$\frac{(\text{Average Sentence Length})^2}{\text{Long Sentence Limit of Writing Task}} + \frac{(\text{Style Problems} + \text{Heavy Words} + \text{Abbreviations} + \text{Specialist}) \times 250}{\text{Long Sentence Limit}} - \frac{(\text{Names} + \text{Interest Words} + \text{Conversational}) \times 25}{\text{Number of Words}} + \text{Sentence Variety}$$

Figure 1. Bog Index Equation

- Grade Level 11.0
- Bog Index: 123 (bad)

Journalism

Elephants, rhinoceroses and wildebeest have migrated across the parched African grasslands to the continent's high tablelands, searching for desperately needed water. Zoologists studying animal migration have reported devastating losses with thirteen million animals under threat. Alexander Donaldson, from the African Wildlife Agency, declared this was 'disastrous and endangering animals to the point of extinction'.

- Average sentence length 18
- Flesch Reading Ease 5.2 (very difficult)
- Grade Level 16.9
- Bog Index: 18 (excellent)

Why does the measure of grade level education show that you need nearly six more years of education to understand the clear and descriptive piece of journalism compared to the mind-numbing management-speak? Why does StyleWriter's Bog Index give the opposite result, considering the journalism excellent writing and the management-speak bad writing? The answer is simple — it depends on how you assess the words and style.

Flesch's Reading Ease and the Flesch-Kincaid Grade Level look at the number of syllables. The journalist's writing contains longer words

— averaging 6.5 characters a word compared to 4.8 (because of the overuse of three-letter abbreviations) in the management-speak example. StyleWriter's Bog Index knows the words in each sentence and distinguishes between words and abbreviations. It allows that clear, specific and descriptive words, proper nouns and Pep words such as **grasslands** and **tablelands** in the journalist's writing add interest and specific content, which make the document easier to read. The Bog Index also marks the management-speak down for using abbreviations, passive verbs, jargon and other style faults, and it finds no Pep to relieve the boring style.

Turning the Bog Index into an editing tool

As StyleWriter's Bog index accurately measures each sentence, we have a powerful editing tool. First, we can plot each sentence on a graph for its readability and style. Second, we can highlight sentences with poor readability and edit them. Third, we can highlight the words, phrases and sentences that need editing in order to improve readability.

How can we be so sure StyleWriter will improve writing style? An independent test of the program on financial documents showed that following editing after applying StyleWriter, the grade level fell by 2.7 from an average of 12.8 to 10.1. In some samples, the grade level fell by 5 years. **G**

Nick Wright BA

is the Director of Editor Software and co-designer of the StyleWriter editing software. An award-winning writer and teacher of business and technical writer services, he specialises in helping companies and government agencies improve writing standards.
E: info@editorsoftware.com
W: www.editorsoftware.com



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