

The Cuttlefish Problem: Readability and “Science-ese” in Scientific Writing

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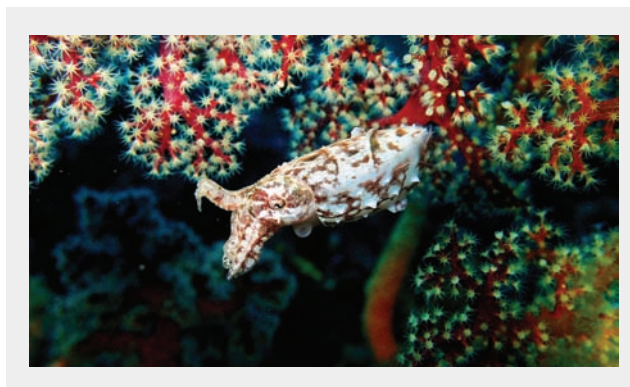
In “Politics and the English Language,” George Orwell’s famous essay on the ills of modern English writing, the 1984 author declared, “The great enemy of clear language is insincerity. When there is a gap between one’s real and one’s declared aims, one turns as it were instinctively to long words and exhausted idioms, like a cuttlefish spurting out ink.”¹

As the essay title suggests, Orwell was mainly criticizing writing related to political matters, but the section on “pretentious diction” does call out scientific writing for that particular vice. The essay also contains Orwell’s legendary list of six writing rules, one of which calls for avoiding jargon as much as possible (but not if doing so results in “anything outright barbarous”). Orwell’s insistence on clear and accessible writing in the interest of the reader’s understanding is still a worthy standard for any written work. Unfortunately, much of modern scientific writing is as obscured with jargon and garbled language as if it had been splattered with cuttlefish ink.

The most recent analysis of scientific writing’s cuttlefish problem was published in eLIFE on September 2, 2017.² William Hedley Thompson and his colleagues from the Karolinska Institutet in Sweden sought to answer a seemingly simple question: Has scientific writing become harder to understand over time? The authors used the Flesch reading ease (FRE) formula and the new Dale-Chall (NDC) readability formula to measure the readability of over 700,000 abstracts for biomedical research articles published from 1881 to 2015 in 122 high-impact journals. The FRE formula was used to calculate readability scores based on the average length of sentences and words, and the NDC formula was used to calculate readability scores based on the number of “difficult” words used (“difficult” words were any words not on a prearranged list of “common” words).

The results were expected but still disappointing: Biomedical abstracts have become harder to understand.

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The average yearly FRE steadily fell while the average yearly NDC steadily rose. Approximately a quarter (26.5%) of the abstracts published in 2015 have FRE scores of <0, which indicates the writing is so difficult to read that even college graduates would likely struggle to understand the abstracts.³ In contrast, only 16.3% of the abstracts published in 1960 had FRE scores of <0.

The authors attribute this decline in readability to the increasing use of both technical jargon and “science-ese,” the authors’ term for “general scientific jargon” (e.g., “furthermore,” “somewhat,” and “consequently”). Such words have become ubiquitous in scientific writing, but they require more effort to read and do not provide much value or meaning in return. As a paper accrues “science-ese,” the reader must put more and more energy into understanding the text. Although some technical jargon is necessary and expected when writing on certain topics, “science-ese” is just fancy cuttlefish residue.

The repercussions of authors spurting jargon and “science-ese” are predictably counterproductive. Papers clogged with rambling sentences and clunky words are needlessly difficult for nonexperts to understand, and many readers may decide the article is not worth the headache. Perhaps worse is the increased risk that a reader will be confused or misinformed by the overwrought text, opening the door to flawed replication studies and inaccurate media reporting.

The study preprint has been reported on by several media outlets,⁴⁻⁶ and this certainly is not the first time scientific

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writing has been scrutinized and found wanting.^{7,8} A variety of resources are available for writers looking to get rid of pesky cuttlefish threatening to blotch their manuscripts,⁹⁻¹¹ but more needs to be done to encourage scientific writers to favor clarity over “science-ese.”

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