

# Lingua Franca and Beyond

**“What is written without effort is, in general, read without pleasure”.**

This statement,<sup>1</sup> attributed to Dr Samuel Johnson (1709–1784), a British author, linguist, and lexicographer, perfectly introduces the article by Julia Bates, who shares her thoughts on how to make our scientific writing easier to read. Julia’s advice is based on a simple rule of three C’s: Be clear, be concise, and be correct, which are easily written down but much more difficult to implement. To write clearly, concisely and correctly requires a lot of effort, thinking, and re-writing, but, as we can see in Julia’s article,

it definitely produces a lot of pleasure during the reading.

Just to follow the second c (be concise), I am stopping here, and wish you a lot of pleasure while reading Julia’s helpful hints.

## Reference

Samuel Johnson. Wikiquote website. [cited 2017 December 18].

Available at: [https://simple.wikiquote.org/wiki/Samuel\\_Johnson](https://simple.wikiquote.org/wiki/Samuel_Johnson).

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## How to make your scientific paper easier to read

Do you ever wonder how many people are actually going to read your paper? I mean, not even my mother has read my papers, and with good reason:

*There is no form of prose more difficult to understand and more tedious to read than the average scientific paper.* – Francis Crick<sup>1</sup>

It is not surprising that scientific papers are difficult to understand; they are usually written for a very specific audience, typically fellow scientists within a niche field. This means that the article is often full of technical information and jargon.

But wouldn’t it be nice if your paper was read by scientists *outside* your field? Or by medical professionals who may implement some of your findings in their treatment plans? Or by journalists who could inform the wider public of the exciting work that you are doing?

Communicating your work clearly to those outside your field is especially important for any research involving vaccines and immunotherapies. Misinformation about vaccines and misleading reports concerning adverse events in the media can have devastating consequences, such as the recent measles outbreaks in Europe resulting from decreasing vaccination rates.<sup>2</sup>

Therefore, we all have a responsibility to communicate scientific research in such a way that it is understood by a broad audience. Your goal should be to inform others, not impress your peers.

The key to making scientific papers easier to read is to follow the three C’s of good writing, namely, to be clear, concise, and correct.

## How do the three C’s apply to science writing?

### 1. Be clear

*My aim is to put down on paper what I see and what I feel in the best and simplest way.*

– Ernest Hemingway

Just like Hemingway, you should write your paper in the simplest way. Try not to over-complicate things, the science is usually complicated enough. When possible, use words that are familiar to the reader; for example, “burgeoning” becomes “increasing” and “aetiology” becomes “cause”. Do not try to impress your reader with complicated phrases or words.

Define or explain any terms that may not be known to the reader. As a general rule, try to make sure that your text is understandable to an undergraduate-educated scientist outside their field of specialty.

Another good tip is to get a

colleague or friend to read your draft, and then ask them what they thought were the main points of your paper. This will tell you whether your writing is clear.

Indeed, as Nancy Baron states in her book *Escape from the Ivory Tower: A Guide to Making Your Science Matter*:<sup>3</sup>

*No matter what your specialty, the keys to success are clear thinking, knowing what you want to say, understanding your audience, and using everyday language to get your main points across.*

I also suggest trying to follow the three C’s of effective paragraphs: context, content, and conclusion. In particular, the first sentence of a paragraph should state the single idea you wish to discuss (i.e., the topic or *context*). The topic sentence is then followed by the *content*, which provides more details to support the main idea. The final sentence of the paragraph provides the *conclusion* or purpose of the content, and may also help lead the reader into the next paragraph or idea.

### 2. Be concise

*So the writer who breeds more words than he needs is making a chore for the reader who reads.* – Dr Seuss

Try to stick to the point. Figure out what your main message is and stick to that topic. Remember that you don’t need to tell the reader everything you know about an entire field in one paper. You may have spent years learning about a particular protein or scientific technique, but it might not be relevant to the topic at hand. Ask yourself whether that sentence or paragraph helps the reader to interpret the findings presented in this particular paper. Also, check that you haven’t duplicated sentences or entire paragraphs in your introduction and discussion.

Another mistake is to use very long sentences, which can leave the reader confused and having to re-read the sentence multiple times. These lengthy sentences can be spotted easily if you read your paper aloud. If possible, try to break



them down into shorter sentences to improve the readability.

You should also remove unnecessary words. For example: “is a reflection of” becomes “reflects”; “we performed a detailed analysis of” becomes “we analysed”; “the question as to whether” becomes “whether”; “in order to” becomes “to”; and “a large majority” becomes “most”. Cutting out these words will also help improve the overall readability.

Another tip for making your paper more concise is to use your references wisely. Instead of providing all the detailed background to a topic, simply pick out the most relevant points to your paper, and then direct the reader to a more comprehensive review article if they wish to learn more.

### 3. Be correct

The third **C** refers to both correct grammar and correct content. The correct use of punctuation and grammar will improve the readability of your paper. Consider the following sentence:

*Inclusion criteria for the study were aged between 10 to 15 years intravenous administration of antibiotics diagnosed with sepsis and no respiratory complications.*

This sentence makes no sense. But with the correct punctuation, it becomes much easier to read:

*Inclusion criteria for the study were: (i) aged between 10 to 15 years; (ii) intravenous administration of antibiotics; (iii) diagnosed*

**Being concise at the expense of being correct is not acceptable when reporting a scientific method or its results.**

*with sepsis; and (iv) no respiratory complications.*

The content (i.e., the science) also has to be correct. Be specific. For example, “We analysed 115 patients with non-small cell lung cancer treated with single-agent nivolumab” is not the same as “We analysed 115 cancer patients treated

with immunotherapy”. Being *concise* at the expense of being *correct* is not acceptable when reporting a scientific method or its results.

## Conclusion

We all have a responsibility to communicate scientific research clearly and correctly. This may help us to overcome the increasing problems in science communication, whereby scientific evidence fails to resolve public dispute over the risks and benefits of discoveries such as childhood vaccines.<sup>4</sup>

So, the next time you sit down to write a paper, remember the simple three C’s of good writing. Writing clearly, concisely, and correctly does take time, but by following these simple tips, your paper should reach a much broader audience.

## Additional resources

The *Nature* website has a great article on writing scientific papers in its section on *English Communication for Scientists*. Available from: <https://www.nature.com/scitable/ebooks/english-communication-for-scientists-14053993/writing-scientific-papers-14239285>.

Richard Threlfall wrote a series of articles on the Chemistry Views website. He takes you through each section of your paper and gives practical tips on how to improve it. There is also a free webinar: How to Write High-impact Research Papers. Available from: [http://www.chemistryviews.org/details/education/5202161/Tips\\_for\\_Writing\\_Better\\_Science\\_Papers.html](http://www.chemistryviews.org/details/education/5202161/Tips_for_Writing_Better_Science_Papers.html).

For basic grammar queries, check out sites like Grammar Girl: <http://www.quickanddirtytips.com/education/grammar>.

## References

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