



Ten Tips for Authors of Scientific Articles

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Writing a good quality scientific article takes experience and skill. I propose 'Ten Tips' that may help to improve the quality of manuscripts for scholarly journals. It is advisable to draft first version of manuscript and revise it repeatedly for consistency and accuracy of the writing. During the drafting and revising the following tips can be considered: 1) focus on design to have proper content, conclusion, points compliant with scope of the target journal, appropriate authors and contributors list, and relevant references from widely visible sources; 2) format the manuscript in accordance with instructions to authors of the target journal; 3) ensure consistency and logical flow of ideas and scientific facts; 4) provide scientific confidence; 5) make your story interesting for your readers; 6) write up short, simple and attractive sentences; 7) bear in mind that properly composed and reflective titles increase chances of attracting more readers; 8) do not forget that well-structured and readable abstracts improve citability of your publications; 9) when revising adhere to the rule of 'First and Last' - open your text with topic paragraph and close it with resolution paragraph; 10) use connecting words linking sentences within a paragraph by repeating relevant keywords.

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INTRODUCTION

Scientific articles are means for scholarly communication. The quality writing of articles leads to successful publications of interest to the global readership. Although scientific and evidence based contents of an article are critical for successful publishing and attracting citations, articulate writing easily understandable for non-expert readers value highly. Once a scientific experiment or an observation are accomplished, authors should think over how to properly describe their research and express their ideas in the context of previous publications. Writing scientific articles is a creative intellectual process which requires professional training in the subject area and accrued writing skills. The accuracy of expressing ideas and referring to scientific facts heavily depends of authors' mentality in their mother tongue. Writing in English is often an uphill task for non-native English speakers, who may succeed by working in a competitive academic environment supporting quality writing.

Numerous guidelines and toolkits from learned associations and experienced researchers are now available for native English and non-English speakers from diverse professional backgrounds (1-4). All of them are helpful novice and seasoned authors. For example, the International Committee of Medical Journal Editors (ICMJE) proposed a comprehensive set of recommendations which aim to standardize the writing by authors, reviewers, and editors (1). The European Association of Science

Editing (EASE) guidelines guide authors how to prepare their manuscript in details over language barrier by collecting many experts' suggestions (2). The American Medical Association (AMA) manual describes every practical item boosting the ICMJE Recommendation with special references for editors (3). My own life-long editorial experience and analysis of the guidance from large editorial associations allowed me to develop 'TenTips' which may be of help for current and future generations of scientific authors (4). These 'Ten Tips' are aimed at improving quality of scholarly works and supporting communication between authors, reviewers, editors, and readers.

TEN TIPS FOR THOSE WHO WRITE SCHOLARLY ARTICLES

Design of articles

First version of an article should have well-thought-out design and structure oriented towards scope of the target journal. All co-authors have to take part at all stages of the writing and be responsible for each and every bit of the scientific contents and conclusions. Non-substantive contributions, writing assistance, reference selection and accurate formatting should be also considered and acknowledged. Proper designing of the work at the start may ease drafting and revising at a later stage and avoid unpleasant conflicts between co-authors and those responsible for the whole process of science communication.

Formatting in compliance with target journal instructions
Careful (re)drafting and formatting is strongly advisable to meet the requirements of the target journal. The absolute majority of biomedical journals adhere to the ICMJE recommended format of the National Library of Medicine (NLM), the so-called Vancouver style. Biomedical authors are strongly advised to familiarize with the original style and its deviations endorsed by the target journal. Instructions to authors often provide descriptions of the modified Vancouver style, which have to be consulted before manuscript submission.

Consistency and logical flow of the writing

Consistency of writing, logical flow of ideas and scientific facts in a manuscript is critical for readability. Consistent tagging of title, abstract and main text with relevant keywords help readers to easily understand scientific content, to draw conclusions, and to refer to specific points in future publications. Proper coordination of multi-authored works throughout manuscript preparation, submission and revision is a key to consistent writing.

Scientific confidence

All co-authors must be confident of their study design, research methodology, results, interpretations, and conclusions. Failure to ensure such confidence at the manuscript submission may result in undesirable ethical investigations, especially when errors, research misconduct and manipulations are surfaced at the peer review and post-publication. Scientific confidence of all co-authors makes their work solid and easily understandable for readers, who may cite it in their own articles.

Each scientific article is a story

Each scientific item should tell readers a story. It starts with an informative background and ends with a conclusion, containing a new and citable scientific fact. Validated methodology and ethical conduct throughout the research and writing guarantee the objectivity and evidence base of the story. The story must be unique and complete. And the authors should take an effort to make their story attractive for a wider readership by avoiding the use of terms and passages hardly understandable for non-experts.

Write short and simple sentences

Scholarly articles differ from novels and other non-scientific writings. And short and simple sentences are keys to successful scientific communications. Non-native English-speaking authors often try to impress their readers by using complicated sentences full of odd and circuitous phrases. Their writings are too often influenced by their mother tongue and mentality established in non-English environment which makes it difficult to articulate in a simple and concise manner. Long sentences are hardly understandable and affect readability of articles. This

is why scientific authors should compose short and simple sentences. The short and simple writing style can be learned by regular reading of scientific articles in traditional and well-edited multi-disciplinary journals such as *Science*, *Nature*, *Cell*, and *The Lancet*.

Those who read titles not always read abstracts

Researchers, seeking relevant sources for their studies, perform initial searches by retrieving titles of scientific articles from bibliographic databases and platforms. Only a small proportion of those who read titles retrieve abstracts and cite the whole article. I suppose that only a small part of primary title readers click to open its abstract. We can attract more readers by good title. Short and content-reflecting titles, relating to evidence of global interest, attract attention of most readers, who cite and boost profile of the articles in citation-tracking databases (5). One more recent skill is making a search engine-friendly title (6). Since article titles are sorted by online engine first, online visibility of an article determines the fate of an article. It is thus advisable to compose short, attractive, tagged with keywords titles of interest to readers from all over the world. Authors from non-Anglophone and small professional communities may particularly improve impact of their articles by sharpening title writing skills.

Those who read abstracts not always read full-texts

Science editors currently advocate relevant and accurate referencing, which primarily implies retrieving and careful reading of full-texts of primary sources (i.e., original articles rather than reviews) (7, 8). Too often, however, those who read abstracts never access full-texts and either cite inappropriately or do not cite relevant sources at all. Proper understanding after reading an abstract should drive readers to look into the full-text. Available evidence suggests that roughly 20% of cited articles are read by citers (9). Apparently, well-structured and informative abstracts may increase citation rates and their correctness.

Relationship between first and last parts

The structure of well-edited articles is based on logical relationship between initial and final parts. An article starts with a paragraph introducing a topic and ends with a concluding paragraph. Likewise, first (topical) and last (concluding) sentences of each paragraph in an article are interrelated and complement each other (10). Intermediate paragraphs (sentences) connect neighboring paragraphs (sentences) to build up full story. Keeping in mind such writing structure helps prepare an article with logical flow of information.

Use of connecting words

When different parts (sentences) of an article are interconnected by (key)words, readability of the whole article improves substantially. Authors are thus recommended to pick and properly

place connecting words, and particularly to provide links between sentences within a paragraph. Such words make the reading fluent and understandable, particularly in extensive discussion parts.

DISCUSSION

The 'Ten Tips' presented above may help authors express their ideas and communicate with readers more effectively. The first tip guides authors how to design (structure) contents of their articles and pick target journal(s). The tip is aimed at easing the drafting and avoiding conflicts between co-authors.

Adhering to technical formatting requirements is essential for most, but not all journals. Current digital publishing provides formatting services that automatically convert texts and references to a style acceptable for a specific journal. The quality of scientific contents is often a top priority for most journal editors. Nonetheless, since proper formatting is a basic requirement of manuscript submission, it is recommended to write the first draft following the format of a target journal.

Keeping consistency of writing is especially important at the current stage of scientific progress, when complicated ideas, complex data and graphics are often fitted into one article. Sharpening skills of consistently expressing ideas and logically linking words, sentences, and paragraphs is thus becoming increasingly important.

Building up a story and properly linking fragmented parts of an article is an essential step towards an intellectual product (11). Easily understandable and readable sentences and paragraphs are building blocks of such product. The golden rule of scientific writing is to have short and simple sentences, which may require intensive and regular reading of the best scientific pieces.

Relevant citations of articles are valued high at the current stage of scholarly publishing. Citation chances improve when authors accurately choose target journals, properly edit titles, and tag titles, abstracts, and full-texts of their articles with relevant keywords.

At the re-drafting of an article authors have to analyze flow of information and links between first and last parts (sentences, paragraphs). Two or more sentences build a paragraph while the paragraphs build an article. When a paragraph starts with topic sentence and ends with concluding sentence, it delivers its message effectively. Within a paragraph, sentences have to be connected by repeatedly used keywords. Readers may comprehend the main message of an article by focusing on connecting words.

The Ten Tips are originally proposed to improve writing skills

of non-native English speakers (4). The guidance can be also helpful for authors working in small professional communities struggling with low visibility and citation rates. In conclusion, I do hope that the 'Ten Tips' will meet the requirements of most journal editors, who wish to produce reader-friendly scientific articles.

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