

1.1: Copy-editing scientific papers

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Editors of science journals deal with manuscripts at a macroscopic level, making sure the science is right. Copy-editors put the same material under a microscope, making sure the presentation of the science is right. But what exactly does copy-editing consist of? This chapter is for new editors and others who want to know what copy-editors do, how they do it, how their work contributes to the publications they work on, and what qualities and resources they need.

Copy-editing assesses correctness, consistency, precision, and all the minutiae that help to make articles acceptable and readable. Those who do this work are called copy-editors, technical editors, manuscript editors, subeditors, or various other names. Some journals and publishers have in-house copy-editing staff, but the work is often done by freelancers working outside the office. Both in-house and freelance staff need to know what level of editing is required and, if a consistent product is to be published, to be familiar with the house style of the journal or publisher.

Levels of copy-editing

For scientific manuscripts, copy-editors check grammar and spelling, make sure that the promised figures and tables are present and suitable for publication, check references, and modify the language where necessary. They also code or tag contributions in electronic format for typesetting – and much else, depending on the various requirements of the particular journal or publisher. The job may include administration as well as technical editing, substantive editing and – occasionally – creative editing. Editors need to decide which of these “levels of edit” are needed for their publication and instruct their copy-editors accordingly.

Administration is usually done by in-house staff who may or may not be copy-editors. It covers such matters as recording the date of receipt of articles, names and addresses of authors, and titles of articles. It may include assigning a reference number, checking that the contribution is complete, acknowledging its receipt, and checking on its progress through the refereeing and publishing processes. Many of these tasks can now be performed automatically by editorial software.

Technical editing is the core business of copy-editors. This kind of editing concentrates on correcting or standardizing the mechanical style, format, and language of papers, so that they conform with house style as set out in a typographic style sheet or other recommendations. It includes some or all of the checks listed in Boxes 1–4.

Box 1. Checklist for mechanical style and format of text

- Is the manuscript complete? Are all files with tables etc. included?
- Does the title page include all the required information?
- Is the format of authors' names, addresses, etc. correct?
- Is an abstract of the correct kind included, if required?
- Are spelling and punctuation consistent?
- Are headings and subheadings in the text clearly ranked?
- Are extracts and quotations clearly indicated and acknowledged?
- Are capital letters, small capitals, italics, and bold type clearly marked and used correctly and consistently?
- Are abbreviations and symbols used correctly and consistently?
- Are abbreviations other than recognized abbreviations for units explained at first mention and later used consistently? Are special scripts and accents clearly presented and used consistently?
- Are mathematical and chemical terms and equations correctly presented? Are numerals correctly written? Commas in numbers should preferably be replaced by thin spaces, to avoid confusion with decimal commas in other languages (see e.g. Ufnalska 2011).¹
- Are parentheses, brackets, and mathematical braces properly paired off?
- Is spacing between mathematical operators, numerals, and symbols appropriate?
- Are acknowledgements properly positioned and marked? If an appendix is included, is it properly positioned and marked?
- Are footnotes and endnotes, if any, clearly positioned and linked to their indicator symbols in the text?

Substantive editing overlaps with technical editing but may not always be part of a copy-editor's job description. It can include:

- revising article titles, table titles, figure legends, and abstracts to make them concise, accurate, and informative, as these parts of the paper are crucial for readers;
- adding keywords;
- examining and improving the logic, order, and emphasis of the text;
- eliminating jargon, repetition, redundancy, and irrelevancies;
- suggesting ways of shortening words, sentences, or

- paragraphs to make the text easier to read (see Box 4);
- cropping illustrations to emphasize the most important parts.

Some of this work may of course be done by a journal editor rather than a copy-editor, depending on the size of the journal and how much time the editor can spend working on it.

Box 2. Checklist for tables and figures

Are tables and figures referred to in the text in correct numerical order?

Do tables and figures show what the text says they show?

Do numbers and other references to table and figure contents match any details cited in the text?

Tables

Do tables have clear titles, column headings, and footnotes, as needed?

Have abbreviations in tables been explained?

Are all footnote indicators correctly attached to footnotes?

Is the arithmetic in tables correct — do numbers in table columns add up correctly, and are percentages correct?

Is the layout of tables clear to readers? If necessary, are different parts of tables clearly marked for typesetting?

Figures

Are line drawings clearly drawn?

Are photographs of good quality?

If figures have been supplied electronically, are size and resolution acceptable?

Have scale bars been included if needed?

Will lettering, lines, and symbols remain legible if reduction is necessary?

Do figure legends agree with what the figures seem to show?

Have symbols and abbreviations in figures been explained?

Creative editing means making major changes in the content or organization of an article. This is usually done by the journal editor, perhaps with referees' suggestions in mind. However, some copy-editing may include this kind of work too, especially if the copy-editors are authors' editors – who work for authors before papers are submitted rather than for journal editors after those papers have been received.

Copy-editing procedure

Both authors' editors and copy-editors in journal offices or publishing houses work on behalf of the eventual reader, focusing on areas that might make the text unclear or redundant. They try to remove the obstacles that hide the author's message, while avoiding distorting that message. They may start by checking that all the necessary parts of the paper – title page, copyright assignments, acknowledgements, tables, figures, and legends – have been included and are in the correct form (Box 1). What is done next depends on what level of copy-editing is required.

Marking up the format for typesetting, or tagging for electronic production, will be the minimum level, followed by marking the mechanical style in the ways indicated in Boxes 1 and 2.

Box 3. Checklist for citations and bibliographical references

Are all citations in the text included in the reference list?

Are all references in the list cited in the text?

If names and dates are given in the text, do they agree with those in the list?

Does the form of citations in the text match journal style?

Are all the required parts of references included in the reference list? Are those parts in the correct sequence and form?

Is the punctuation correct?

Is the typographical style (roman, italics, bold) correct?

If journal titles are abbreviated, are abbreviations correct?

Does the form of references to books, reports, and other types of publication match the required style?

Are links to internet resources valid?

The third level, correcting the language (Box 4), may be done at this stage, including substantive editing if this is required. A separate stage is usually needed for checking references and reference style in the ways listed in Box 3. Checking references may include verifying that the original source has been correctly cited; however, few if any journals routinely make this time-consuming check and it is usually done only if discrepancies are noticed. URLs should be checked to ensure accuracy and functionality.

One possible method of working is to deal with all the required levels of editing together, during one or two readings of a manuscript, followed by a separate stage for cross-checking and styling references. Another method is to edit the language first, at the same time as substantive editing if this is required, followed by format and mechanical style, again with reference checking and tagging for electronic production as separate stages.

If there are queries for authors, they may need to be answered before the manuscript is sent for typesetting or posted online. Any questions not answered at this stage can be marked on the author's proofs.

Copy-editors may also be responsible for checking proofs and making sure that answers to queries are incorporated in the final version of the article.

House style

Journals and publishers usually prepare style sheets: lists of their preferences on what is to be abbreviated, capitalized, italicized, or hyphenated, and on what spelling or punctuation should be used when acceptable alternatives exist. This is house style, built up from a mixture of experience and editorial idiosyncrasies. As well as encouraging consistency, house style saves time that would otherwise be spent making decisions about the same matters over and over again.² More extensive style sheets

may develop into style books and include information on nomenclature and terminology in the specialties covered by the publication(s). House style also applies to the details of how citations are made in the text and how they are styled in the reference list. Copy-editors should be consistent in applying house style; if there is no house style, they should draw up their own list of instructions.

Box 4. A checklist for language editing

Spelling and punctuation

Is the spelling correct and consistent, according to house style?

Are quotation marks correctly used according to house style or national conventions?

Are parentheses correctly placed?

Are subjects and verbs separated by paired commas or no commas (never by one)?

Are commas in adjectival clauses correctly used?

Are hyphens and en and em dashes correctly used?

Have apostrophes been kept to a minimum and been correctly used?

Are colons and semicolons correctly used?

Have exclamation marks and dashes been kept to a minimum?

Grammar and syntax

Do verbs agree with their subjects?

Have auxiliary verbs been included where necessary?

Are participles and infinitives correctly attached to their subjects?

Has the passive voice been kept to a reasonable minimum?

Are tenses correctly used?

Have abstract nouns been used with restraint?

Have strings of three or more nouns been kept to a minimum?

Do pronouns refer clearly to a preceding noun?

Have relative pronouns been correctly used?

Have definite and indefinite articles been included or omitted, as necessary?

Have prepositions been correctly used?

Are comparatives complete?

Have words been used in the right order?

Usage

Is usage correct according to current recommendations?

Have words been used with precision?

Have the simplest words and the simplest ways of writing been used?

Have sexist, racist, or dehumanizing terms been transformed or removed?

- make essential changes only;
- protect readers from authors and authors from themselves, i.e. make the manuscript easy to read and correct;
- be prepared to accept that their version of the author's prose is not necessarily an improvement – argue so far but no further, then give way gracefully;
- be ready to respect authors' feelings – provide praise before criticism;
- comment constructively when comment is needed;
- look for answers from reference sources or previous issues of the journal before putting queries to an author;
- keep queries to the author short and to the point.

Is copy-editing useful?

Editors new to the job may think that papers accepted for publication can be printed as they stand. This may be possible if the authors are skilful writers and exceptional keyboarders. Otherwise editors, readers, and printers or typesetters find that copy-editors make the publishing process much smoother and more economical in time and money. As well as improving the language of many papers,⁴ copy-editors remove the minor errors that annoy readers but may easily go unnoticed by editors and referees – and if readers find mistakes in details, they become suspicious of the rest of what authors have to say. Correctness in apparently minor matters is important in science, because readers may want to repeat experiments or observations. Copy-editors also keep production costs down by removing redundant material, styling manuscripts in an acceptable way, and providing clear instructions for typesetters or accurate tagging for electronic production.

Who are the copy-editors?

In many countries there is no clear path to becoming a copy-editor for a scientific journal or other publisher. A degree in an appropriate branch of science may help, but a degree in the humanities may be useful too. The ability to handle language sensibly and sensitively, a (well-controlled) passion for accuracy, and a good eye for errors and inconsistencies are essential qualities.

Formal qualifications in copy-editing are awarded by the Board of Editors in Life Sciences (BELS; www.bels.org), based in the USA. BELS holds examinations in North America and elsewhere and awards the qualification ELS: Editor in the Life Sciences. In the UK, the Society for Editors and Proofreaders (SfEP; www.sfep.org.uk) offers an accreditation scheme for copy-editors and proofreaders. These organizations and others, including some universities, in the USA, UK, Australia, the Netherlands, and elsewhere, provide short courses on copy-editing or publishing/editing. Other useful courses are those on writing well in science. Many of these courses are listed in EASE's journal, *European Science Editing*, and on EASE's website (www.ease.org.uk). Some publishers also hold in-house courses for new freelance staff and others.

Working principles for copy-editors

In their work, copy-editors should be encouraged to observe certain principles.³ They should:

- leave well enough alone — if authors write correctly, their own wording should be kept;
- find good authority for any changes needed;

Resources for copy-editors

A good reference library, and experienced co-workers who can be asked for advice, are the main resources for copy-editors, as well as the ability to use the internet. Some books and websites are listed below. Joining an association of editors, such as EASE, is a good idea too (for other examples, see www.ease.org.uk/resources/useful-links). Joining an online forum will also prove useful in finding answers to difficult questions and providing moral and practical support when problems arise.

Dictionaries

Acronym Finder (www.acronymfinder.com)

Dictionary.com (www.dictionary.com)

Dorland's illustrated medical dictionary, 32nd ed. 2011. Philadelphia, PA: Saunders.

Henderson's dictionary of biology, 15th ed. 2011. Harlow, UK: Pearson Education.

McGraw-Hill dictionary of scientific and technical terms, 7th ed. 2010. New York: McGraw-Hill.

Merriam-Webster Dictionaries (www.merriam-webster.com)

OneLook Dictionaries (www.onelook.com)

Oxford Dictionaries (www.oxforddictionaries.com)

Stedman's medical dictionary, 28th ed. illustrated. 2005. Philadelphia, PA: Lippincott Williams & Wilkins.

Wiktionary (http://en.wiktionary.org/wiki/Wiktionary:Main_Page)

yourDictionary.com (www.yourdictionary.com)

Editing and publishing in science

Butcher J. *Copy-editing: the Cambridge handbook for editors, authors and publishers*, 4th ed. Cambridge: Cambridge University Press, 2006.

Style manuals

AIP Publication Board. *AIP style manual*, 4th ed. New York, NY:

American Institute of Physics, 1990. (www.aip.org/pubservs/style/4thed/toc.html)

American Psychological Association. *Publication manual of the American Psychological Association*, 6th ed. Washington, DC: American Psychological Association, 2009.

BMJ house style (www.bmj.com/about-bmj/resources-authors/house-style)

Council of Biology Editors. *Scientific style and format*, 7th ed. Reston, VA: Council of Biology Editors, 2006.

Dodd J.S. *The ACS style guide: a manual for authors and editors*, 2nd ed. Washington, DC: American Chemical Society, 1997.

Iverson C (ed.) *AMA manual of style: a guide for authors and editors*, 10th ed. New York, NY: Oxford University Press, 2007.

University of Chicago Press. 2010. *The Chicago manual of style*, 16th ed. Chicago: University of Chicago Press.

English grammar, usage, and guides to writing

Albert T. (ed.) *The A-Z of medical writing*. London: BMJ Books, 2000.

Collins *COBUILD English Grammar*. London, UK: HarperCollins, 1990.

Fowler H. and Winchester S. (eds) *Fowler's modern English usage*, 3th ed. Oxford: Oxford University Press, 2004.

EASE guidelines for authors and translators of scientific articles to be published in English (www.ease.org.uk/publications/author-guidelines).

Goodman N.W. and Edwards M.E. *Medical writing: a prescription for clarity*, 3rd ed. Cambridge: Cambridge University Press, 2006.

Kirkman J. *Good style: writing for science and technology*, 2nd ed. Oxford, UK: Routledge, 2005.

Ngram Viewer (www.books.google.com/ngrams) [for comparing frequency of synonyms or spelling variants]

O'Connor M. *Writing successfully in science*. London: HarperCollins, 1991. [Now handled by Taylor & Francis.]

Ritter R.M. *New Hart's rules: the handbook of style for writers and editors*. Oxford: Oxford University Press, 2005.

Strunk W. Jr, White E.B. and Angell R. *The elements of style*, 4th ed. Boston, MA: Allyn & Bacon, 2000. (Earlier edition online at www.bartleby.com/141/)

Reference checking

PubMed/Medline (www.ncbi.nlm.nih.gov/pubmed/) [for checking details of publications in the biomedical sciences]

GoogleScholar (www.scholar.google.com) [for general reference searches]

Online forums

EASE-forum: subscribe at majordomo@helsinki.fi [open to non-members as well as EASE members]

Electric editors: www.electriceditors.net [several forums and many useful links]

References

1 Ufnalska S.B. EASE guidelines help editors and scientists save time. *Science Editor* 2011; 34(4): e10.

2 Cooter M. Putting on the style. *BMJ* 1999; 319: 1592. (<http://bmj.com/cgi/content/full/319/7225/1592>)

3 O'Connor M. *How to copyedit scientific books & journals*. Philadelphia, PA: ISI Press, 1986.

4 Cooter M. 2008. Style: what it is and why it matters. In: Hall G.M. (ed.) *How to write a paper*, 4th ed. London: BMJ Publishing Group, 2008.