

W(h)ither Technical Editing?

The omission of a single letter can transform meaning, and even the best spell-checking software cannot replace careful proofreading. If you are not convinced, read the title of this article again. Another incontrovertible fact is that human beings make mistakes. Those two facts probably explain the development and continued existence of technical editing, which comprises an array of activities designed to increase the consistency, accuracy, and usefulness of written material. However, the obvious effects of editing, or of the lack of it, might explain why it has been so little studied. Most people simply assume that technical editing raises the quality of publications and do not bother to test the assumption.

What little research there has been on the effects of technical editing points to modest improvements in readability and reference accuracy.¹ However, virtually all the research was done on large biomedical journals, which invest heavily in manuscript preparation and may not be typical of science publications. Another reason for our lack of understanding is that most studies have examined the effects of a largely unspecified editing “package” and did not distinguish among the effects of the various activities that occur between acceptance and publication of an article. A systematic review focusing on biomedicine identified just 11 relevant studies published up to 2000.¹ We are updating that review, but our initial searches suggest that no substantive studies have appeared in the last 5 years to reinforce or shift our conclusions.

Regardless of the lack of research, technical editing has been discussed in several forums. The World Association of Medical Editors (WAME) e-mail list discussed the case of an author who refused to accept a journal's changes.² Both journal editors and authors' editors who joined the discussion expressed the view that authors must accept journal copyediting and the imposition of house style. Several also comment-

ed that journals should make potential contributors aware of that condition in their instructions for contributors.

Although I agree wholeheartedly with that sensible advice, which I have sometimes given myself,³ I admit that the discussion also brought to mind Raymond Chandler's splendidly tetchy response to being edited: “Would you convey my compliments to the purist who reads your proofs and tell him or her that I write in a sort of

study estimated the cost of editing to be about \$40 per page and was one of the first to point out that the coding and tagging required for electronic publication actually cost more than editing for paper journals.⁶ A more recent evaluation of the economics of open-access publishing noted that “the one expense that escapes automated systems, and often goes beyond the volunteered time of editors, is copyediting and proof-reading, which may run to \$10,000

“Would you convey my compliments to the purist who reads your proofs and tell him or her that I write in a sort of broken-down patois which is something like the way a Swiss waiter talks, and that when I split an infinitive, God damn it, I split it so it will remain split.”⁴

— Raymond Chandler

broken-down patois which is something like the way a Swiss waiter talks, and that when I split an infinitive, God damn it, I split it so it will remain split.”⁴ But journal editors will probably protest that they rarely receive submissions from authors who write half as well as Chandler and that the responsibilities of authors of scientific fact differ from those who write crime fiction.

One factor that has drawn attention to technical editing is the debate about journal funding, open access, and electronic publication. That debate has caused publishers and academics to scrutinize the cost of publishing journals. A byproduct of the discussion has been increased insight into the costs of technical editing. A recent Australian study suggested that “production editing” cost between US\$250 and US\$330 per article, depending on the type of journal.⁵ An earlier (1996) Canadian

annually for a typical quarterly journal”.⁷ The Canadian report also noted that copyeditors “are highly skilled people” and reckoned that “it takes about nine months to train a scientific copy editor”.⁶

Even the strongest advocates of the liberation that accompanied electronic publishing admit that it has not killed technical editing. The American Psychological Association was one of the first to “go electronic”, but its publications director commented in 1998 that “I tried hard for a ‘no technical edit’ approach, but it simply proved impossible. All authors, even the most accomplished, need copy editing of some sort.”⁸ An analysis of the economics of electronic journals published in 1997 observed that the factors that distinguish journals from preprint archives were “filtering of submissions” and “editing”.⁹ The author also observed that “most scholars

agree that journals do perform an important role". Even in the world of physics, which appears to have embraced the preprint server most wholeheartedly, more traditional peer-reviewed and edited journals still survive. In other disciplines, such as medicine, preprint servers appear to have had little effect on the face of publishing.

Advances in electronic communication have provided new methods of technical editing, moving from paper markup to on-screen editing. This was a focus of discussion at CBE's annual meeting 7 years ago.¹⁰ The panel members explained that electronic copyediting may bring advantages in accuracy, speed, and consistency, but all commented on its disadvantages, such as the need to "pre-edit" submitted documents to remove bugs and the problems associated with training and equipping freelance editors with journal systems. Surprisingly, no one seems to have commented on the effects on the copyeditors, their preferences for screen or paper, or the effects of different editing media on editors' performance. I still print hard copy for anything that requires careful proofreading, and the fact that proofs are usually sent to authors as PDFs (portable document files), which are not designed for on-screen reading, suggests that I am not alone.

A different form of pre-editing revealed by the WAME discussion was the practice of improving submissions *before* they are sent to reviewers.² That showed how some editors are prepared to work with authors to improve the presentation of their findings. It contrasts with the practice of journals that have high rejection rates, which edit articles only after acceptance. Such altruistic (and, one suspects, time-consuming) behavior seems to occur mainly in smaller, local journals, but pre-editing should be encouraged because it may help to educate authors and save reviewers' time.

So whither technical editing for science journals in the 21st century? Like the paper journal, technical editing has not been killed by electronic publishing despite many prophecies of doom and the emergence of preprint servers in some disciplines. Commercial publishers still seem prepared to invest in this function and, now that

they are increasingly called on to explain how they add value to the process to justify their costs and profits, are actually proclaiming the benefits of technical editing.

Even if budgets are squeezed or funding models transformed (for example, by switching from subscription to "author pays"), it seems likely that money will still be found for technical editing. However, another discussion, this time on the European Association of Science Editors (EASE) Forum, suggested that publishers may try to reduce costs by shifting this work to low-wage countries, such as India and countries in the Far East.¹¹

I am still surprised that publishers are prepared to spend money, and editors prepared to devote time, to processes that we do not really understand. I would therefore welcome more research into the effects of copyediting on regular journal readers (as opposed to editors and reviewers) and more detailed analysis of the components of technical editing to determine which aspects are the most helpful. Lastly, I would like to see a journal prepared to develop a truly evidence-based house style, that is, one demonstrated to improve article readability and utility. There is evidence that readers prefer structured abstracts over unstructured ones and that structuring improves information retrieval,¹² but there is virtually no published research on other style features that journals impose.¹ I suspect that some design aspects, such as page layout and choice of typeface, represent nothing more than journal "branding", but it would be useful to know for sure. Moving slightly beyond the realm of technical editing, journal editors might consider how different methods of presentation affect readers' perception and interpretation of data. Those who take their role in improving science communication seriously should consider incorporating such evidence into their instructions for contributors.

Our updated systematic review will probably conclude that there isn't much evidence that technical editing raises the quality of articles, but that wouldn't mean that it doesn't work. Critics of evidence-based everything point out that most people don't need a randomized trial to convince them

that parachutes are helpful for those who jump out of airplanes. Perhaps technical editing falls into the same category. Now where did I put that piece about the withering of technical editing? 

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