Inclusivity in Science Communication: Prepublication Perspectives: Webinar Commentary

Eleonora Colangelo, Barbara Gastel, Christopher Magor, and Janaynne Carvalho do Amaral

Introduction

In a thought-provoking post from *Retraction Watch* on July 29, 2024,[1] a surprising comparison posed an arresting question: What do fairytales and scientific papers have in common? The answer highlighted a complex issue: Just as fairytales create an illusion, so too can researchers, sometimes unintentionally, generate an "illusion of novelty" in their findings. This happens particularly when results cling to the edge of statistical significance, suggesting something novel without clear substantive weight. This parallel sheds light on a critical, yet often overlooked, facet of science communication: the way research is crafted, communicated, and perceived, even before it reaches publication.

Although distinct in focus, the August 2024 webinar,[2] organized and moderated by Eleonora Colangelo, and generously sponsored by Digital Science, resonated strongly with the concerns raised in the *Retraction Watch* piece. The overall discussion focused on science communication in the prepublication phase, an area where researchers have the opportunity not just to shape narratives but to engage openly in shaping methodologies, analyses, and findings before they are set in academic stone.

Eleonora Colangelo is Public Affairs Officer, Frontiers; Barbara Gastel is Professor of Integrative Biosciences and of Medical Humanities, Texas A&M University; Christopher Magor is Senior Science Editor, Japan Medical Communication; and Janaynne Carvalho do Amaral is Postdoctoral Research Associate, University of Illinois Urbana-Champaign, School of Information Sciences.

Our webinar speakers offered insights that push science communication toward inclusivity and innovation, emphasizing the need for accessible language and targeted mentorship programs, particularly for early-career researchers and those from diverse linguistic backgrounds. The conversation examined key themes, such as the role of mentorship in guiding researchers, the benefits of inclusive peer review practices, and new peer review models that incorporate broader perspectives. In unpacking these themes, the discussion reinforced the idea that impactful science communication begins well before research sees publication.

Science Editors as Communication Mentors

Barbara Gastel, who teaches science editing and related subjects at Texas A&M University and directs the science journalism graduate program there, discussed providing communication mentorship as a science editor. She emphasized that science editors in various roles are well positioned to integrate mentorship into their interactions with authors and others. Points included the following.

Prime candidates for mentorship by editors include early-career researchers publishing their first few papers, more advanced professionals with little publication experience (e.g., those who recently moved from clinical to academic roles), and authors publishing in a new language or culture (including those publishing in a discipline other than their main one). Some pluses of working with such candidates are their high motivation, the suitable context provided for adult learning, the ability to affect both current and future papers, the chance to train individuals who may themselves train others, and the potential for rapid tangible success. In addition, by helping such candidates write well, the mentorship can facilitate subsequent work by peer reviewers and editors.

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Individuals with various roles in science editing or peer review can contribute communication mentorship in various ways. For example: Author's editors can provide mentorship through "educational editing" which contains more explanation of revisions and suggestions than typical substantive editing does, may have a relatively long and didactic cover letter, and may provide sample corrections and have the author make the rest. Some author's editors, such as those at The University of Texas MD Anderson Cancer Center and those at Nationwide Children's Hospital, also provide educational offerings such as workshops or courses. In addition, author's editors can contribute mentorship through their availability to answer questions, for example, when an author is uncertain how to address an item from a peer review.

Peer reviewers also can contribute mentorship. When reviewing manuscripts by authors who appear inexperienced or otherwise poorly versed, they can provide "educational peer reviewing"—for instance, by including more explanations than usual, demonstrating requested revisions more than usual, suggesting resources more than usual, and perhaps being more tactful than usual. Also, experienced peer reviewers can mentor beginning peer reviewers through "co-peer reviewing," in which (at the editor-in-chief's suggestion or with the editor-in-chief's permission) a senior peer reviewer and junior counterpart collaborate on a review. As described at the 2024 CSE annual meeting, one journal that promotes co-peer reviewing is *Academic Psychiatry*.[3]

Various categories of editors at journals also can, and do, provide mentorship to current and prospective authors and peer reviewers. For editors of journals from professional societies, a well-established way to do so is through instructional sessions at society conferences. Other means of such outreach include presentations in other contexts, as well as webinars, videos, and podcasts. Some editors also offer guidance through editorials or special articles in their journals. In addition, some journals have fellowship programs in which early- or mid-career scientists or health professionals obtain mentored experience in journal editing and related realms; examples appear in the *Science Editor* article by Semro[4] and an associated table.[5] More broadly, journals can promote excellence within their own staff and among authors and reviewers by fostering a "mentorship culture," in which editors-in-chief, managing editors, manuscript editors, and others at the journal view guiding and educating others as a priority.

In short, many aspects of the editorial process in science offer opportunities for mentorship. Pursuing these opportunities can promote excellence in science publication and a humane publication culture in science.

Promoting Better Inclusion of Authors From Outside the Anglosphere

In his talk, Christopher Magor, a senior science editor and Research Integrity trainer based in Japan, discussed some of the challenges multilingual researchers encounter during the publication process. He also presented strategies aimed at promoting inclusive language and providing support to these authors, ensuring they can deliver equitable research outputs. Magor's analysis drew on his experiences as a science editor in Japan. Although it is not clear whether this experience fully reflects the situation in all non-Anglophone countries, he considers it to be representative of the situation in Japan. Following are the key points he addressed in his speech.

According to the Nature Index,[6] authors from non-Anglophone countries account for almost 60% of English-language publications. It would seem reasonable to assert that this important author group is included in terms of number of publications. However, this does not reflect the overall inclusivity of the publication process. Researchers for whom English is not their first language often face additional costs that researchers from Anglophone countries do not face.[7] In addition, the time it takes to write an article or to prepare English language presentations can be greatly increased. While it may be impossible to completely overcome these disparities, there are ways in which the prepublication process can be more inclusive.

To gain an overview of the prepublication process, it is important to first consider the pathway of a typical peer-reviewed journal article written by a group of Japanese authors. The typical prepublication editing process looks something like this: 1) the authors agree on the contents of a draft; 2) the corresponding author engages the services of a communications agency (responsible for editing and proofreading) that forwards the draft to an editor; 3) the editor checks the draft, and returns it to the agency with corrections and queries; 4) the agency returns the edited draft to the corresponding author; and 5) the author either re-revises it and returns it to the agency for a second edit or submits it to the journal. It is unusual for there to be any direct contact between the editor and the author as this would place the communications agency at risk of losing business to the editor.

Another challenge, in terms of quality, is that not all people who edit are editors. Much of the work is done by graduate students or postgraduates who work for the larger internationally based agencies temporarily. Depending on the agency, they may receive some training or information about best practices. However, the quality of the output can vary widely.

The editing heatmaps in the Figure illustrate—at the character level—the volume of changes that are made to

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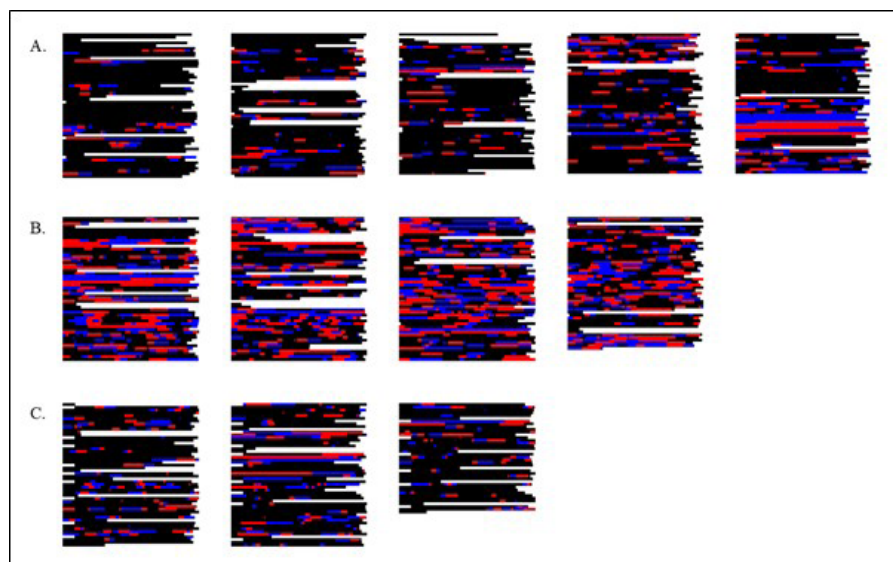
Figure. These editing heat maps were created using a Visual Basic macro for Microsoft Word. Briefly, the macro converts each character to a red (deletions), blue (insertions), or black (unchanged) block based on the tracked changes in the manuscript. The title page, references, and figure legends are removed to focus on the abstract and main text. The font, size (12 pt), vertical spacing, alignment, and margin sizes are unified, and headers and footers are removed. This visual representation provides an approximate reflection of the intensity of an edit. The 3 panels show A) a moderately intensive edit, B) a moderately intensive edit, and C) a secondary edit of a manuscript that was submitted to an English-language journal.

typical manuscripts, with Figure C showing the changes to a short manuscript that was sent for additional proofreading prior to publication in an English language journal in Japan.

When the editing process works as it should, the article is prepared to a publishable or near-publishable state, subject to any changes that are requested by the peer reviewers. However, a high-quality edit is no guarantee of a fair and equitable peer review process. While most reviewers will judge a manuscript based on the quality of the science and the accuracy of the language, Magor still encounters innumerable cases in which reviewers include throwaway comments about language (namely, comments related to language quality that do not reflect the quality of the language, in other words, comments based on the nationality of the author or the location of the research). When discussing this issue with other editors, Magor recalled not being surprised to learn that we had all experienced cases in which reviewers had made throwaway comments related specifically to language and grammar.

In one extreme example, the editor remarked, "The reviewer complained of *wholesale* grammar errors, but when we reviewed the manuscript, we could not find a single error." For the author, such comments can be an enormous problem. The author's language ability may not be sufficient for them to judge whether the comments are accurate. In most cases, the manuscript must be reevaluated at the cost of additional time and sometimes money. If the manuscript has been through an editing agency, this sort of follow-up is typically handled for free (and at the expense of paying work). Much of this inconvenience and extra cost would be avoided if the reviewer simply provided specific and actionable comments about what they thought was wrong.

Vague criticisms about language will send the author and their editor searching for an undefined number of needles in the haystack.

In Magor's experience, there seems to be improvement in the interactions between reviewers and authors for whom English is a secondary or additional language. Reviewers, for their part, seem to be more aware of the challenges that these authors face. To continue this trajectory, and establish a more diverse and inclusive publishing environment, Magor argues that we should actively encourage authors, editors, publishers, and other stakeholders to form direct connections and build professional networks that can connect authors to the support they need during the prepublication process.

(Non)Academic Voices in Peer Review and Science Communication

Open peer review can be implemented in various ways, according to open peer review traits chosen by the editor. Examples of open peer review traits are revealing the identities of authors and reviewers along the peer review process and the publication of reviewers' reports alongside the paper. In her talk, Janaynne Carvalho do Amaral, social anthropologist and information scientist from Brazil, currently a postdoctoral research associate at the School of Information Sciences at the University of Illinois Urbana-Champaign, presented the structure of open peer review models with public participation implemented in some scholarly and scientific journals, based on her PhD dissertation finalized in 2022, and current research on public engagement with science. As examples of journals, she mentioned *Atmospheric Chemistry and Physics*[8] (interactive

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public peer review, 2001—includes academic voices), *Journal of Instructional Research*[9] (hybrid peer review process, 2012—includes academic voices), *Economic Thought: History, Philosophy, and Methodology*[10] (open peer discussion, 2012—includes academic voices), *Research Involvement and Engagement*,[11] and *BMJ* (open peer review—includes academic reviewers, patient reviewers, and the public). By observing these models, Carvalho proposed that the meaning of "public" in public peer review may vary from one discipline to another according to the goals and initiatives of each journal. Peer reviewers can be invited by the editor, self-appointed, and/or indicated by the authors. In addition, open peer review models with public participation may be divided into 2 categories: hybrid open with multiple stages and open with one stage divided into steps.

Carvalho argued that open peer review models with public participation can bring a new role to scholarly and scientific journals and be a powerful tool to connect science and society and promote inclusion, diversity, and equity in academia, because it may attract a variety of readers with different experiences and expertise. However, more research needs to be conducted on public participation in peer review—mainly approaching power dynamics among researchers and minorities in science and researchers and the public.[12] Carvalho also connected her perspectives with AIDS activism in the 1990s, which challenged the authority of physicians and scientists with a concern shared among public academic voices and nonacademic voices after reviewing a manuscript: "Being treated as an equal partner in the peer review process—Will the editor/author consider my peer review report?"[13,14] Including nonacademic voices in peer review may be an opportunity to share our work with the public, learn from the public, and build trust with the public. However, these initiatives must be responsively and reflectively guided not only by scientific evidence, but by active listening, empathy, humility, and respect for other types of knowledge.

Conclusions

In the ongoing journey toward a more inclusive research communication, the prepublication phase stands out as a crucial space for meaningful transformation. It is in this liminal stage, just before research steps into the spotlight, that authentic dialogues begin—dialogues with the potential to reshape the entire scientific landscape. Invited experts illuminated this transformative power, first emphasizing the essential role of mentorship from editors and peer reviewers. For early-career researchers, especially those navigating the intricate waters of multilingualism, such guidance acts as a

beacon. Multilingual challenges faced by many researchers are not merely obstacles but critical gaps that must be addressed. Moreover, the exploration of open peer review models and the integration of public voices into the evaluation process opens up new frontiers in science communication: by welcoming nonacademic contributors into the peer review arena, it is possible to not only enhance transparency but also bridge the gap between science and society. The wish is to see these 3 crucial aspects—mentorship, multilingual tolerance, and the inclusion of engaged nonexpert voices in public science evaluation—more prominently acknowledged in both current and future educational frameworks for science communication professionals.

Disclosure

For Magor's presentation, generative artificial intelligence (Copilot and ChatGPT) was used to create and refine the Visual Basic code used to generate the Editing Heatmaps and to adjust the size and position of the Editing Heatmaps array in Microsoft PowerPoint. All code was generated with human oversight.

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