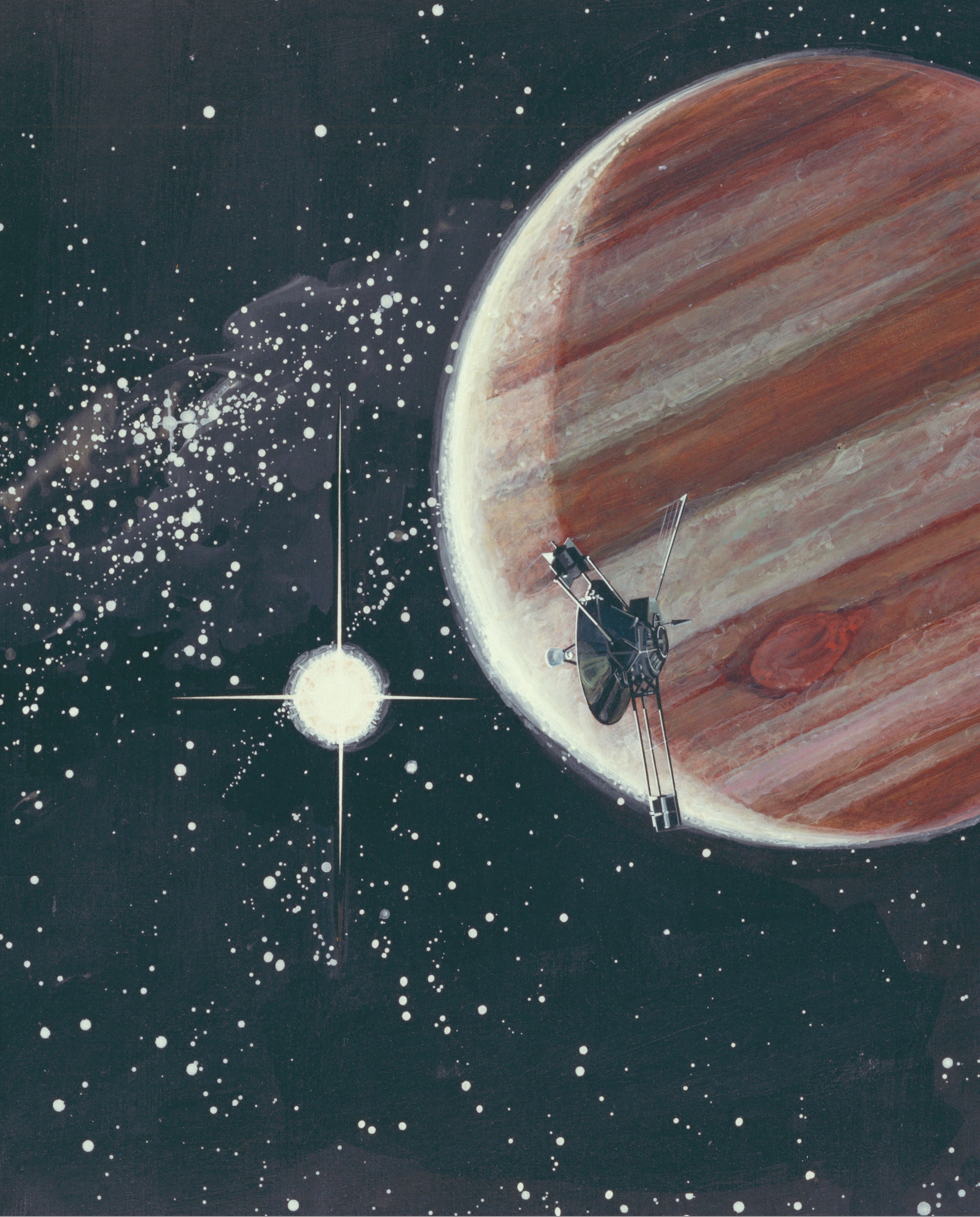
JUNE 2023 • VOLUME 46 • NUMBER 2

SCIENCE EDITOR

A PUBLICATION OF THE COUNCIL OF SCIENCE EDITORS

IN THIS ISSUE:



Pioneer 10 spacecraft passes by the gas giant planet Jupiter. Illustration by Rick Giudice (NASA).

SCIENCE EDITOR
JUNE 2023
VOLUME 46 • NUMBER 2
www.CSEScienceEditor.org

www.CouncilScienceEditors.org

FEATURES

INTERVIEWS

WEBINAR REPORTS

ANNUAL MEETING REPORTS

DEPARTMENTS

On the cover: *To mark NASA's Year of Open Science, the image on the cover of this issue of Science Editor is from the James Webb Space Telescope that went live last year, opening up some of the deepest, darkest regions of space to observation. As described by NASA, the cover image is "of the central region of the Chamaeleon I dark molecular cloud, which resides 630 light-years away. This image primarily shows blue smoky wisps on a dark background. The left top side additionally features orange and white wisps. Just below them are four bright points of light. Three are orange and one is a mix of white and orange. Each of these points have Webb's signature 8-point diffraction spikes emanating around them in long, thick orange lines, so that they look like huge snowflakes. Scattered throughout the image are distant stars or galaxies in shades of red, orange and blue, seen as tiny blobs."* ***Credit:*** *NASA, ESA, CSA, and M. Zamani (ESA). Science: M. K. McClure (Leiden Observatory), F. Sun (Steward Observatory), Z. Smith (Open University), and the Ice Age ERS Team (CC-BY). https://flic.kr/p/2ocuKQE*

Assessing the Effectiveness of SciScore in Supporting the Reproducibility of Scientific Research

Martijn Roelandse, I. Burak Ozyurt, Daniel Evanko, and Anita Bandrowski

Abstract

It is critical for researchers and grantees alike to adhere to rigor and transparency criteria to ensure their contributions to scientific research are sufficiently transparent so they can be replicated and eventually reproduced. SciScore evaluates scientific manuscripts for compliance with consensus granting agency and journal recommendations designed to address different aspects of rigor and transparency in the published literature (e.g., MDAR [Materials Design Analysis Reporting], ARRIVE [Animal Research: Reporting In Vivo Experiments], CONSORT [Consolidated Standards of Reporting Trials], RRID [Research Resource Identification] standards). SciScore has been implemented by several society publishers in different ways, with one allowing authors to run the tool as often as they wish, and another having editors verify manuscripts using the report provided by the tool. Results show that the use of the tool led to an increase in the average SciScore over time or via the revision process. The use of the tool also resulted in an increase in the number of manuscripts with RRIDs, a fairly easy transparency criterion to check. We conclude that the use of the tool is effective in improving some aspects of rigor of research articles.

Martijn Roelandse (https://orcid.org/0000-0001-5596-8084), martijnroelandse.dev, Ouderkerk aan de Amstel, The Netherlands; I. Burak Ozyurt (https://orcid.org/0000-0003-3944-1893), SciCrunch Inc., San Diego, CA, and Department of Neuroscience, University of California, San Diego, La Jolla, CA; Daniel Evanko (https://orcid.org/0000-0002-8097-8601), American Association for Cancer Research, Philadelphia, PA; Anita Bandrowski (https://orcid.org/0000-0002-5497-0243), Department of Neuroscience, University of California, San Diego, La Jolla, CA.

Opinions expressed are those of the authors and do not necessarily reflect the opinions or policies of the Council of Science Editors or the Editorial Board of Science Editor.

Introduction

Rigor and transparency criteria for the biological sciences are now well-defined by funders,[1] publishers,[2] and meta-researchers.[3] All essentially agree on several key aspects of the study that are consistent with higher levels of replicability of a study. These recommendations have been common practice in clinical studies for decades but have been infrequently used in the preclinical literature.[3] These key aspects of the study include the authors addressing the following: blinding of investigators or subjects with regard to group membership, randomizing subjects into groups, determining group size based on the power calculation, adding a detailed description of subject selection criteria as well as attrition, and of course, treating sex of subjects as an important biological variable. In preclinical studies, unambiguous identification of key resources such as mice and reagents such as antibodies is accomplished by the use of Research Resource Identifiers (RRIDs[4]). RRIDs are persistent identifiers for key resources (antibodies, model organisms, and software projects) assigned to help researchers cite these in the biomedical literature to improve the transparency of research methods.[5] In addition, the deposition and validation of data and code into appropriate repositories and the use of protocol databases or protocol journals are all aspects of manuscripts that are associated with better quality.[6–8]

To improve scientific reproducibility within their articles, multiple publishers have put forward new editorial policies and guidelines for authors. The most visible case is perhaps *Nature*, which implemented a checklist that all authors must address. Over 1000 journals now ask that authors identify key resources by using the RRID, resulting in 500,000+ RRIDs being used in scholarly literature by 2022.[9] Various society publishers have implemented checklists and processes that require many of these rigor-related items to be addressed. All of these are laudable steps toward more

CONTINUED

reproducible scientific literature; however, these are not cost-free endeavors because enforcement of any of these can be significant, especially as they involve staff time.

SciScore[10,11] is a methods review tool for scientific articles that can check for most of the common rigor criteria, data deposition, and RRIDs in an automated way (Figure 1). The tool can be used as a standalone, such that editors or authors run methods sections through our tool to assess their adherence to common rigor and reproducibility guidelines. It can also be integrated in a journal submission platform such as eJournalPress or Editorial Manager, where it is used by a number of publishers. While integrated, it will cost little to no staff time to run because submitting authors paste relevant sections of their paper into a tool without leaving the submission platform.

The tool has been used for over a year at several society publishers, and we now examine what sorts of conclusions can be drawn from the past year of work. We will examine several use cases in how the tool was implemented and examine how this process impacts the behavior of authors. Although the publishers involved in this study may well be tracked down, we choose to use the method of implementation instead of the names of the participants. These methods of implementation of SciScore should be transposable to any publishers that would like to use them.

Methods and Results

To analyze the effectiveness of our tool in the various journal submission workflows, we downloaded the scores from the SciScore database. Each of the use cases represents the data of 1 publisher with multiple journals. Data were further analyzed in Google Sheets, where it was split out into original submissions and revisions. We were grateful to receive 200 original submissions and matched revisions from a publisher not working with us for our control. For these experiments (see Figures 7 and 8), we also used 200 original submissions and matched revisions from 2 journals from use case 1 and 2.

Use Case 1: "Free for All"

The publisher allowed authors to access the SciScore tool as frequently as the authors desired during submission and all subsequent revisions prior to manuscript acceptance. The tool must be run at least once at each step but may be run by authors multiple times at any step. Authors, editors, and reviewers had access to the reports. There was no special mention to reviewers that they should or should not review the report. Under 1 year into the use of the service, the publisher updated the SciScore submission question to encourage authors to revise their methods if they received a score below 4 with no further consequence if they failed to do so.

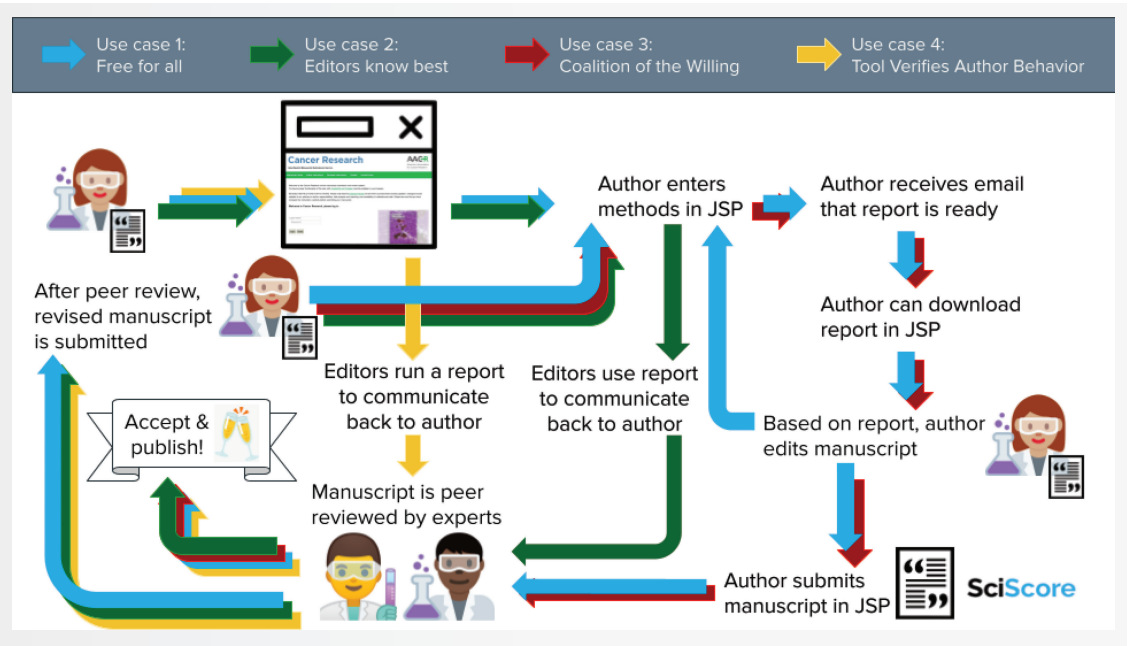


Figure 1. Overview of 4 workflows of SciScore integration in journal submission platforms. Blue arrows: Author enters their methods to SciScore during submission and can rerun this process, iterating their methods, before final submission. Report and score are available for both authors and editors/reviewers, and the process is repeated at revision. Green arrows: Author submits their methods; however, the report is primarily used by editor/reviewer in their feedback to the author. The process is repeated at revision. Red arrows: Author enters their methods once during revision; however, this is not a mandatory process. Both author and editor/reviewer can access the report. Yellow arrows: The methods are entered by journal editors, and they use it in their feedback to the author.

CONTINUED

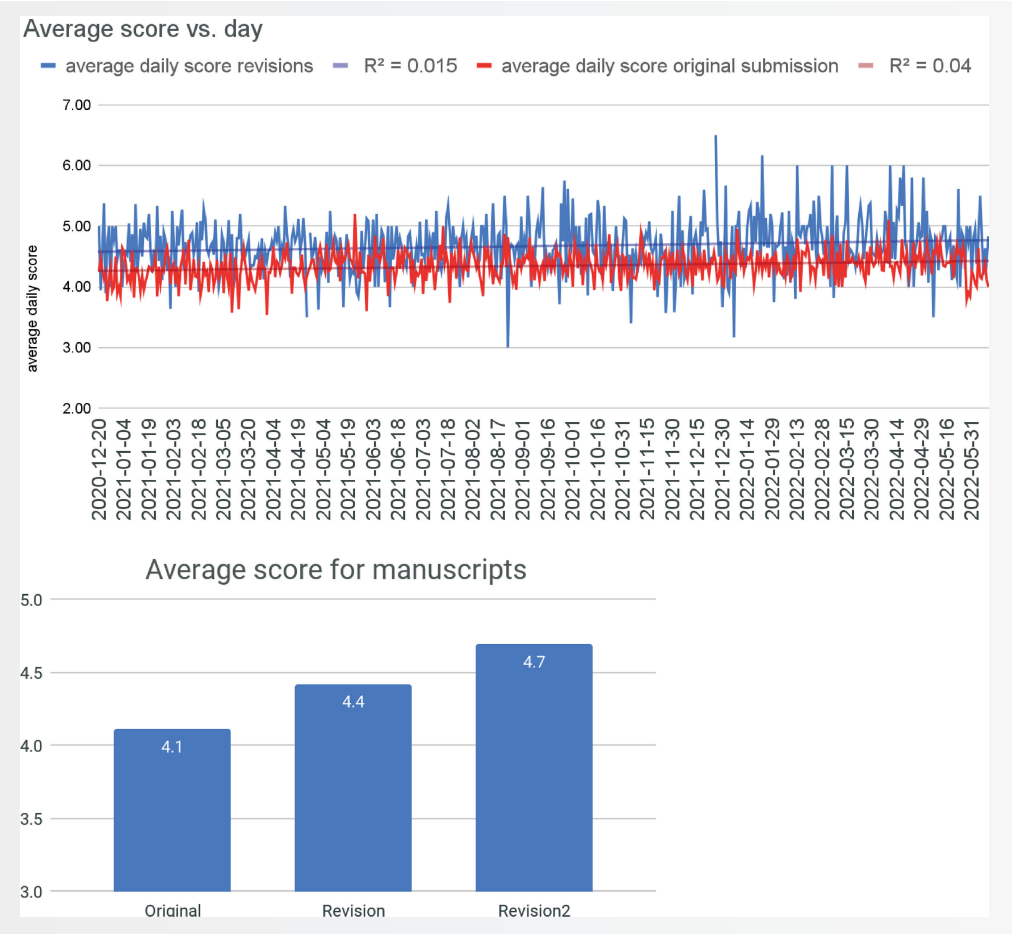


Figure 2. "Free for All." (top) The average daily score across all runs within the journal submission platform, original submissions n = 18,311, and revisions (n = 6,518). (bottom) The plot shows the average SciScore for all manuscripts over a 2-year period as a function of revision.

We downloaded the numerical scores for each run of the tool for the publisher and plotted the average monthly scores over time. These scores were stored in the back end of our platform, which was connected to the publisher's journal submission platform. The tool measured all initial submissions, revisions, and any runs that a user did multiple times to determine if scores were changing over time at a gross level. We found that over time, the average daily scores increased both for original submissions and revisions. We also found that with revision of the manuscript, the average score increased. This suggests that the combination of review and tool use is effective at improving scores.

Compliance is hard to measure, except in the case of RRIDs, which can be measured by just searching for the term across journal articles (requires access to the full text). If we assume that all manuscripts have an RRID (which is not exactly true, but it is a reasonable assumption), then the question becomes does SciScore compliance drive additional usage of RRIDs. A request to add RRIDs was added to the instructions to authors of the journal in April 2018, and the SciScore tool was added in June 2020. As Figure 3 (online) shows, the percentage of papers with RRIDs increased substantially immediately after the addition of SciScore and then continued to rise; currently, the rolling average is around 25% (115 per month) of manuscripts. Working with SciScore thus seemed to have accelerated the upward trend. The possibility exists though that some portion of this increase in RRID usage was due to increased uptake of RRIDs in the cancer research field covered by the publisher. To examine this possibility, RRID usage at comparable journals from other publishers was evaluated by searching for the term "RRID" in the subset of articles that also contain the term "cancer". Results were expressed as a percentage of the total number of published articles containing the term "cancer" (see Figure 3, inset [online]) and showed that the rate of growth in the usage of RRIDs in the "Free for All" publisher (Journal Portfolio A) greatly exceeded that of cancer journals in another publisher with a similar range of impact factors (Journal Portfolio B), 3 individual cancer journals (Journals 1–3) with impact factors

CONTINUED

similar to the average impact factors of journals in Journal Portfolio A, and an open access mega journal (Journal 4). Results strongly suggest that increased uptake of RRIDs in the cancer community would explain only a small fraction of the increase observed in the "Free for All" publisher.

Use Case 2: "Editor Knows Best"

This publisher had a stringent checklist of rigor items, agreed upon by the publications committee, that was used by editors to verify that all manuscripts meet the guidelines. The usage of the tool happened at each manuscript stage but was primarily intended for the editors who can verify that the checklist items that they are concerned about are present in the manuscript. This process is *facilitated* by our tool, as opposed to being *mediated* by our tool because editors communicated with authors about what their manuscripts were missing. The authors were allowed to see the SciScore reports as they were completed. A letter was sent to authors to address the items highlighted in the report. The reviewers were also able to see the report, but they were not directed to look at the content, so it is unclear whether any reviewers saw or acted on the report.

We downloaded the numerical scores from our database and found that there were no differences in the average monthly scores. However, manuscript revisions averaged much higher than original submissions (Figure 4 [online]). This suggests that the combination of editorial oversight and tool use was effective in improving scores.

Use Case 3: "Coalition of the Willing"

The publisher implemented SciScore access for all authors who were willing to use it at the revision stages only but did not mandate this for any of the authors at any stage. The number of total runs for this publisher was far smaller, constituting about one-third of the total manuscripts. For this use case, we must note that this publisher started with a single journal, and then brought on several additional journals after 1 year. The data for these additional journals were omitted from this use case because these new journals started at a somewhat lower average score. These 2 additional journals' (Journal 2 and Journal 3; Figure 5 [online]) SciScore averages were similar in value to where Journal 1 started and had only a couple of months of data; therefore, they were not evaluated further.

The data for use case 3 consisted entirely of revisions to papers and involved a small portion of the total papers, roughly 30% of all accepted manuscripts to the journal. The data showed that scores grew dramatically in this journal, echoing the gains made in the first use case in the first 3 months of use of the SciScore tool; however, they were sustained during the entire period of use, so far. This also suggests that the overall score of the journal may not improve as much as might be suggested by these rather sanguine changes because the total number of papers counted here is not 100% of the papers published.

Use Case 4: "Tool Verifies Author Behavior"

The publisher implemented a set of stringent guidelines in 2015[12] that strongly encourages authors to address rigor criteria in their manuscripts. In 2018, these guidelines were refined and updated,[13,14] and in 2019, SciScore staff started to use SciScore in a manner similar to use case 2, simply obtaining the report and contacting authors with requested changes. In 2020, the editors started to run the tool and provided the authors with the reports without additional notes or interpretation (Figure 6 [online]).

Control

The key question is what happens with journals and manuscripts that do not work with SciScore? To that end, we looked at 190+ manuscripts in journals of 3 different publishers across 12+ months. For all manuscripts, we had both the original submission and revised manuscript. This would help us to assess how far these manuscripts had improved in both presence and absence of SciScore integration.

First, we calculated the average SciScores for all 3 cases; control, use case 1, and use case 2 (Figure 7, top). In all cases, the average score increased from original submission to revision, including our control case. We subsequently broke down the scores in a histogram for both original and revised manuscripts (Figure 7, bottom). It is worth noting that our control is rather exceptional in the scores with a high percentage of very high-scoring papers (i.e. "6" scores; based on Menke,[11] a "6" is in the 96th percentile of all scores). This can largely be explained by the discipline of the journal (medical); something we observed earlier was that the medical journals largely outperformed preclinical journals, once published.[10] In the control journals, we saw "3" scores disappearing from original manuscripts to revisions. Similarly, in use cases 1 and 2, we saw "6" scores increase between original submissions and revisions.

In Figure 2 and Figure 5 (online), we saw an increase over time in daily average scores. We wanted to know whether this increase over time would also be visible for the matched manuscripts. We plotted the scores for the manuscripts over time for both submitted and revised manuscripts and calculated a trendline. What we saw was that, in the control situation (Figure 8, top), without SciScore integration, the trendline remained stable, with an R^2 of close to 0. The R^2 for original submission even seemed to decrease (i.e., lower scores over time). Looking at the left panel (Figure 8), for revised manuscripts, we see an R^2 of close to 0.3 (i.e., 30% of the variation toward the mean can be explained by working with SciScore). The effect is a bit weaker for original

CONTINUED

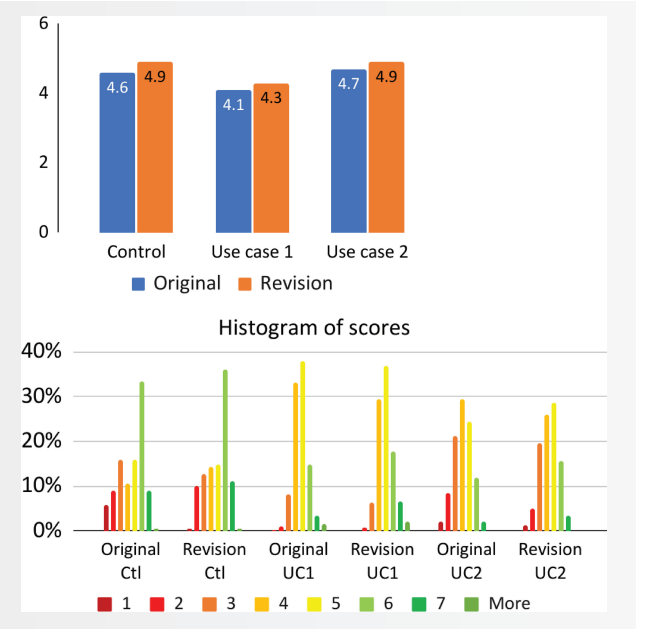


Figure 7. Average Sciscore increases between original submission and revisions. (top) Average SciScore for manuscripts at submission and revision for control (n = 190), use case 1 (n = 1.515), and use case 2 (n = 236). (bottom) Histogram of scores for the matched manuscripts.

submissions (18%). In use case 2 (Figure 8, right) we see a similar effect, and interestingly, a stronger effect for the revisions (20%) vs original submissions (4%).

Discussion

Since the inception of SciScore in 2020 and its integration in major journal submission platforms later that year, various use cases have been initiated at a number of society publishers, as outlined above. Whereas some publishers let authors use the tool in an unlimited fashion at various stages of the peer-review process, others opted for more limited and directed use of the tool. Up until now, it was largely unknown whether working with SciScore had any effect on the rigor and reproducibility adherence of journals, let alone which of the use cases would provide the best result. With the data laid out in this paper, we can draw a couple of conclusions.

Limitations of the Study

In this comparison of the 4 use cases with control, we were limited by a number of factors. Although we had 4 use cases, only 2 of them had such an integration that we could compare scores of identical papers at submission and revision stages. The other 2 use cases (3 and 4) used a different setup where the tool was used primarily by editors or by willing authors at revision. Therefore, there was no way to compare the results of these 2 use cases directly with use cases 1 and 2. We also cannot know at the current moment what the final published manuscripts will score, as many of these are embargoed for roughly 6 months, making a direct comparison difficult. We have sufficient data for this only in use case 4, but not yet for the others. Although the journals used in our comparison (Figure 6 [online]; Figure 7) are all life science and/or medicine, they are also different, especially in that the focus of the control is medicine, and the focus of other journal use cases is preclinical research. We know that medical journals tend to score higher than preclinical journals once the papers are published.[10] The histogram of scores illustrates this point, with a high percentage of "6" scores for the control vs the others.

In use case 1, we observed an increased score between original submission and revision across all analyzed manuscripts. In this use case, the tool is primarily author-centric. We could also see a slight increase in the daily average score, which might be explained by authors' increased awareness of rigor and reproducibility guidelines. These results are consistent for both the average daily scores as well as matched manuscripts of original submissions and revisions.

In use case 2, the tool is more editor- and reviewer-centric because it helps them in their feedback to authors. Authors do not encounter any SciScore reports nor information on the publisher website, which may explain why average scores for original submissions remain relatively stable. If we look at individual journals, we notice that all journal average scores increased to some degree. The variety may be explained by the variety in editorial boards—some editors may use the tool more than others.

In use case 3, we see an interesting diversion from the previous 2 cases. In this use case, SciScore was only used by authors (as in use case 1), but it is used in the revision stage for a small percentage of manuscripts. Although the average scores of all tested manuscripts increased rapidly, it is unclear what the overall effect is for the journal because most manuscripts were not tested in review. It remains to be seen how these papers will affect the journal's 2021 RTI (Rigor and Transparency Index).[10] However, the 4% month over month increase in the average score is encouraging because it suggests that the editors are becoming increasingly aware of rigor and reproducibility guidelines.

From the last use case, we can learn that implementing rigor guidelines alone does not necessarily increase the journal RTI sufficiently, but a combination of SciScore and rigor guidelines seemed to improve scores substantially. The biggest jump in RTI of over 1 point score increase and a more than 50% jump in the percentage of papers with RRIDs occurred once SciScore staff started to run reports, contacting authors with requested changes.

CONTINUED

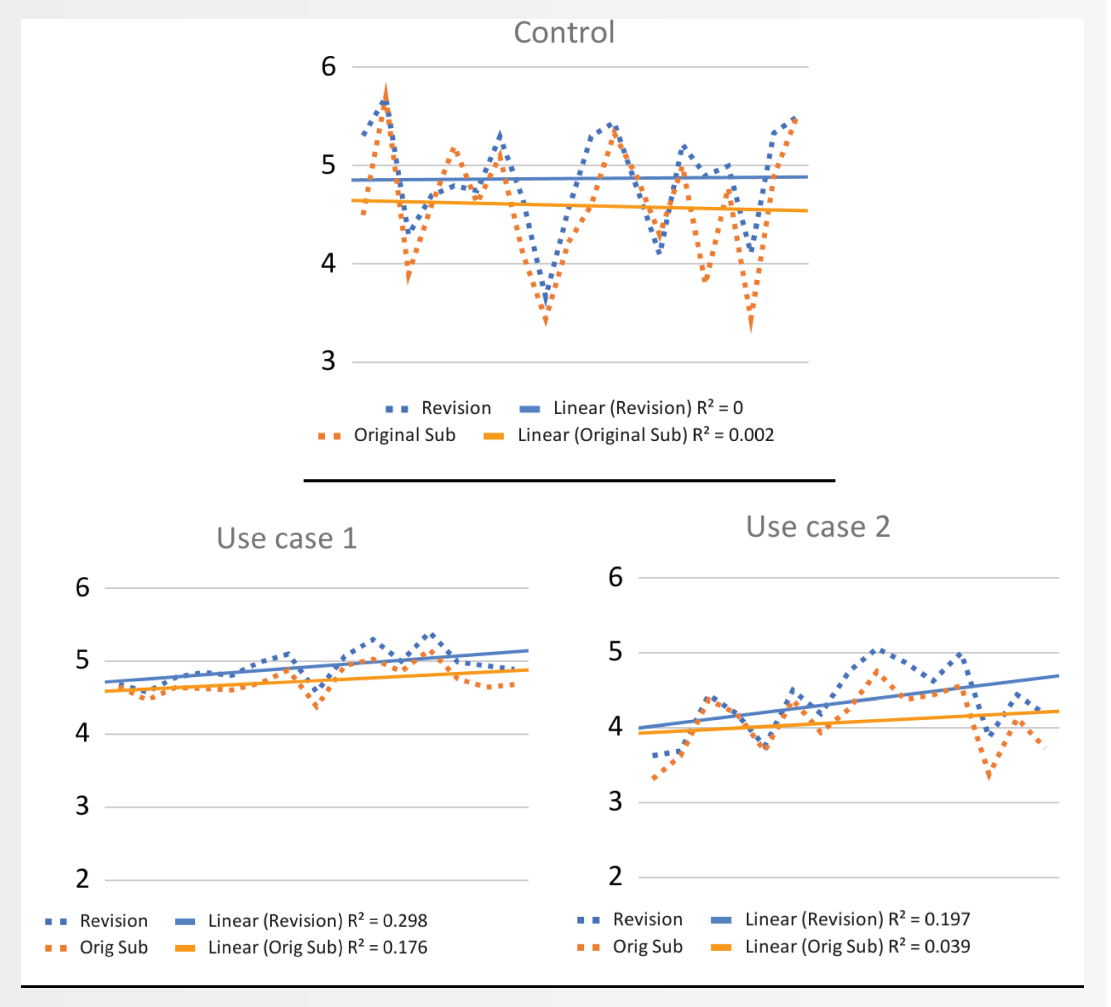


Figure 8. Sciscore trends over time for original submission and revisions. For display purposes we have plotted grouped averages instead of individual dots; however, these did not affect the trendlines.

Although the data for the 4 use cases look promising, proper control was needed to assess how far the results presented were an effect of the entire peer-review process or the integration with SciScore. We have seen in our earlier work[10] (Figure 2; Figure 3 [online]) that journals can increase their RTI if they change their approach, for example, in 2013–2014, when *Nature* made a significant push with authors to address rigor criteria, or in 2016 when *Cell* and *eLife* introduced STAR (Structured, Transparent, Accessible Reporting) methods formatting and implementation of RRIDs in their respective journals, contributing to a noticeable improvement in antibody identifiability for the entire biomedical literature.

In our control dataset, we compared scores of original submissions and revisions of the same papers from a publisher not working with SciScore. This showed that the average SciScore for those papers increased between original submission and revision, in a similar manner as for those journals working with SciScore. This suggests that peer review and editorial oversight in and of itself do improve rigor and reproducibility adherence in journals. However, in contrast to control, the scores increased over time, suggesting that authors and editorial teams became more aware of rigor and reproducibility issues and highlighted those in their comments to the authors. As a consequence, our data suggest that journals working with SciScore increase their average score over time and increase their adherence to rigor and reproducibility guidelines, whereas journals not working with SciScore tend to remain more stable over time.

The other benefit of working with SciScore may simply be that the tool makes it easier for editors to strictly enforce the

CONTINUED

standards that they are intending to enforce. Unlike humans, SciScore does not ever tire of pointing out that blinding is also missing in a particular manuscript, therefore making it easier for editors to highlight commonly omitted items. Neither does it suffer from error or inattention blindness or task monotony.

Conclusion: Dialing in Transparency

Although changes in journals tend to be gradual, Figure 5 (online) shows that they can be relatively abrupt, with over 50% shift year over year in compliance with the RRID standard. While training staff and maintaining high standards for publication, SciScore can enable journals to dial in reproducibility simply by requesting that authors achieve a certain score. This feature of the tool was used only by the journals represented in use case 1, where authors are asked to score higher than a 4/10; however, this number can be moved by asking authors to achieve a different score. We anticipate that as journal editors get to know and trust the tool, they will start to use the score to improve transparency compliance by requesting it and ensuring that the score obtained is sufficient.

Disclosures

A.B. and I.B.O. have an equity interest in SciCrunch Inc, the company behind the development of SciScore. D.A. works for the American Association for Cancer Research, one of the clients of SciCrunch Inc. The terms of this arrangement were reviewed and approved by the University of California, San Diego, California, in accordance with its conflicts of interest policies. M.R. and I.B.O. serve as independent contractors for SciCrunch.

Acknowledgements

The authors would like to thank the anonymous publishers who gratefully agreed to allow use of their data in this study. We also thank Adam Day, Sage Publishing, for helpful conversations and insights into this work. SciScore was funded by the US National Institutes of Health (OD024432, DA039832, DK097771, MH119094, and HHSN276201700124P). This project has been made possible in part by grant 2022-250218 from the Chan Zuckerberg Initiative DAF, an advised fund of the Silicon Valley Community Foundation. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscripts.

References and Links

1. Landis SC, Amara SG, Asadullah K, et al. A call for transparent reporting to optimize the predictive value of preclinical research. Nature. 2012;490:187–191. https://doi.org/10.1038/nature11556
2. Macleod M, Collings AM, Graf C, Kiermer V, Mellor D, Swaminathan S, Sweet D, Vinson V. The MDAR (Materials Design Analysis Reporting) Framework for transparent reporting in the life sciences. Proc Natl Acad Sci U S A. 2021;118. https://doi.org/10.1073/pnas.2103238118
3. Macleod MR, O'Collins T, Horky LL, Howells DW, Donnan GA. Systematic review and metaanalysis of the efficacy of FK506 in experimental stroke. J Cereb Blood Flow Metab. 2005;25:713–721. https://doi.org/10.1038/sj.jcbfm.9600064
4. https://www.rrids.org/
5. Bandrowski AE, Martone ME. RRIDs: simple step toward improving reproducibility through rigor and transparency of experimental methods. Neuron. 2016;90:434–436. https://doi.org/10.1016/j.neuron.2016.04.030
6. Curtis MJ, Ashton JC, Moon LDF, Ahluwalia A. Clarification of the basis for the selection of requirements for publication in the British Journal of Pharmacology: editorial. Br J Pharmacol. 2018;175:3633–3635. https://doi.org/10.1111/bph.14443
7. Tedersoo L, Küngas R, Oras E, Köster K, Eenmaa H, Leijen Ä, Pedaste M, Raju M, Astapova A, Lukner H, et al. Data sharing practices and data availability upon request differ across scientific disciplines. Sci Data. 2021;8:192. https://doi.org/10.1038/s41597-021-00981-0
8. Nosek BA, Ebersole CR, DeHaven AC, Mellor DT. The preregistration revolution. Proc Natl Acad Sci U S A. 2018;115:2600–2606. https://doi.org/10.1073/pnas.1708274114
9. Bandrowski A. (2022). A decade of GigaScience: What can be learned from half a million RRIDs in the scientific literature? GigaScience. 2022;11:giac058. https://doi.org/10.1093/gigascience/giac058
10. Menke J, Roelandse M, Ozyurt B, Martone M, Bandrowski A. The rigor and transparency index quality metric for assessing biological and medical science methods. iScience. 2020;23:101698. https://doi.org/10.1016/j.isci.2020.101698
11. Menke J, Eckmann P, Ozyurt IB, Roelandse M, Anderson N, Grethe J, Gamst A, Bandrowski A. Establishing institutional scores with the rigor and Transparency Index: large-scale analysis of scientific reporting quality. J Med Intern Res. 2022;24:e37324. https://doi.org/10.2196/37324
12. Curtis MJ, Bond RA, Spina D, Ahluwalia A, Alexander SP, Giembycz MA, Gilchrist A, Hoyer D, Insel PA, Izzo AA, et al. Experimental design and analysis and their reporting: new guidance for publication in BJP. Br J Pharmacol. 2018;172:3461–3471. https://doi.org/10.1111/bph.12856
13. Docherty JR, George CH, Giembycz MA, Hoyer D, Insel PA, Izzo AA, Ji Y, MacEwan DJ, Sobey CG, Stanford SC, et al. Experimental design and analysis and their reporting II: updated and simplified guidance for authors and peer reviewers. Br J Pharmacol. 2015;175:987–993. https://doi.org/10.1111/bph.14153
14. Teytelman L, Stoliartchouk A, Kindler L, Hurwitz BL. Protocols.io: virtual communities for protocol development and discussion. PLoS Biol. 2016;14:e1002538. https://doi.org/10.1371/journal.pbio.1002538

Introducing the DEIA Community of Practice from C4DISC

Patricia K Baskin on behalf of the Coalition for Diversity & Inclusion in Scholarly Communications

The Coalition for Diversity & Inclusion in Scholarly Communications (C4DISC) is launching a new initiative, the C4DISC Community of Practice (COP), to provide a virtual space for peer-to-peer learning regarding diversity, equity, inclusion, and accessibility (DEIA) in scholarly communications. For those with a dedicated role or a personal interest in spreading DEIA values, and whether they are acting in a paid role or as a volunteer, the COP venue offers a space for discussion of issues related to DEIA in your organizations. The purpose is to share knowledge and provide ideas and potential solutions to take back to the organizations that each of us represents or influences. C4DISC envisions the COP as a venue for building trusted connections and providing knowledge-sharing opportunities for organizations about their DEIA work.

An initial pilot session with more than 30 participants was held in January of this year and was open to anyone interested in peer discussions related to DEIA. Participants joined a Zoom call in which everyone was encouraged to discuss challenges in their organizations. Feedback followed, indicating enthusiasm to continue the initiative.

Although the pilot COP discussions centered around how DEIA work is organized or staffed in participants' organizations/communities and the DEIA initiatives that they worked on throughout the past year, thoughtful suggestions for future meetings included choosing specific topics and the types of support that participants need. Potential topics included spreading awareness of DEIA issues, making content more inclusive, creating DEIA committees, and getting buy-in from other staff in participants' organizations, along with general discussions regarding best practices, policies, and examples.

After the feedback from the pilot call, C4DISC decided to hold virtual discussions every two months that will combine time for open discussion with topical breakouts based on suggestions from participants ahead of the calls. Those interested can join discussions regularly or whenever topics on the agenda appeal to them. Discussions will not be recorded and minutes will not be taken. Conversations remain confidential among participants to foster open sharing of information. A working group of volunteers has been recruited to coordinate the activities of the COP.

C4DISC has also set up a COP listserv as an asynchronous space for ongoing discussion and networking. It will also house a crowdsourced resources document where those joining calls or communicating on the listserv may choose to share resources.

C4DISC hopes the COP will be an opportunity to learn about DEIA work already happening within our organizations, to share strategies, coordinate efforts, and to surface topics that warrant more in-depth discussion. You may register your interest in joining the COP calls online[1] as well as submit topic discussion ideas. Please share with any peers (at your organization or others) who may be interested.

About C4DISC

C4DISC is a volunteer-driven organization with a mission to work with organizations and individuals to build equity, inclusion, diversity, and accessibility in scholarly communications. The vision of C4DISC is a socially just community that welcomes, values, and celebrates all who seek to contribute to scholarly communications. Learn more at https://c4disc.org/.

Reference and Links

1. https://forms.gle/Fc8w7WEWrkVguknYA

Patricia K Baskin is Executive Editor, Neurology® Journals.

https://doi.org/10.36591/SE-D-4602-09

The 2023 AAAS Annual Meeting: Some Communication-Related Highlights—And Challenges

Barbara Gastel

Selection pressures from the COVID-19 pandemic and its aftermath have caused much in society, including conferences, to evolve. For example, for 2021 and 2022, the American Association for the Advancement of Science (AAAS) moved its annual meeting online. For 2023, with epidemiologic conditions improving, AAAS chose a hybrid model for its annual meeting, themed "Science for Humanity" and held March 2–5 in Washington, DC. Sessions were to be available simultaneously in person and online.

As usual, I was coordinating *Science Editor* coverage of the AAAS meeting. Several current or former graduate students and I were each to cover a session, and I was to compile the reports into an article. As secretary of an AAAS section, I was attending the meeting in person. The others planning to provide session reports had arranged to attend online.

Soon into the meeting, I began receiving messages from the graduate students, stating that their assigned sessions were now being listed as available only in person. AAAS then posted a message[1] saying that because of technical issues, the rest of the virtual portion of the meeting was being suspended. AAAS said it was striving to record the sessions and make them available. Later, however, it announced that recordings suitable to share could not be recovered.

Having committed to *Science Editor* coverage, I revamped my schedule to attend more of the communication-related sessions, and I have written the report. Some team members who had planned to cover sessions served as reviewers of a draft. Highlights of several sessions follow.

Barbara Gastel is a professor at Texas A&M University, where she directs the graduate program in science and technology journalism.

Opinions expressed are those of the authors and do not necessarily reflect the opinions or policies of their employers, the Council of Science Editors, or the Editorial Board of Science Editor.

Driving Diversity in Scholarly Research Publishing

At the session "Driving Diversity in Scholarly Research Publishing," speakers from 3 publishing entities discussed their efforts to promote diversity.

Mia Ricci, Director of Publications Operations at the American Geophysical Union (AGU)—which publishes 23 peer-reviewed journals—said that since approximately 2020, AGU publications have accelerated their efforts regarding diversity. The emphasis, she said, has been on overcoming barriers. Efforts are being made, she said, to keep publication charges from serving as barriers to authors. Other efforts, it was noted, include training editors about promoting diversity.

Karla Soares-Weiser, Editor-in-Chief of the Cochrane Library—which has long been providing rigorous systematic reviews on health topics—identified limitations of her publication regarding diversity and inclusion. In particular, she noted that 84% of the authors come from high-income countries, and the reviews tend to focus on topics of concern in such countries. Steps being taken include focusing more on producing systematic reviews relating to the United Nations Sustainable Development Goals, translating materials into more languages, and using different formats for different audiences.

Finally, Valda Vinson, Executive Editor of *Science*, described how *Science* is trying to increase diversity and avoid bias at various stages of the publication process. For example, diversity has been increased on the board of reviewing editors, which recommends which submissions to send for in-depth peer review. Also, *Science* is now using sensitivity readers, for example, to help ensure that portrayals are respectful. In addition, *Science* is working with its press officers to help increase the diversity of authors quoted in popular media.

Ask a Reporter Anything: A Look behind the Scenes of Television News

In introducing this session on television science reporting, moderator Meredith Drosback, of the AAAS-based science information service SciLine, emphasized that television

CONTINUED

remains a major source of news for the U.S. population. Then Miles O'Brien, of the PBS News Hour, and Stephanie Ebbs, of the ABC News climate unit, provided inside looks at covering science for television. They also gave tips for working with television journalists. In keeping with the speakers' field, the session abounded with quotable content.

The speakers said the nature of the reporting process depends on whether the story will be longform (7–8 minutes for television) or breaking news. Ebbs described how a longform piece entails lots of preliminary information-gathering and discussion. Breaking news stories, both speakers said, are "a scramble." O'Brien urged scientists contacted about breaking news to reply promptly. He said not to just say "We don't know enough." Sources "do know enough to give a couple of well-informed sentences," he added.

Both speakers emphasized including the human element. "Every TV story is about the people," O'Brien said. Ebbs noted, "People care about people." O'Brien also said that passion is key. He said he is always seeking "interesting ideas and interesting scientists with energy" who can "meet him halfway on helping people understand."

Other points from the session included the following: Talks by scientists often are posted on YouTube; reporters view them to see how the scientists come across on video. Being topical and getting to know the interview bookers can help obtain guests on talk shows. News releases serve as starting points for broader stories (in O'Brien's words: "a little bit of bait to get us in the boat"). And, as noted by Ebbs: It's helpful to contact the reporter *before* the study appears in a journal.

In closing, the speakers encouraged collaboration. "Please engage with us, and help us tell the story," O'Brien said.

The Science of Storytelling: A Roadmap for Strategic Engagement

In this session, 2 filmmakers discussed using storytelling to engage and activate audiences regarding science.

Sam Sheline, of National Geographic's video team, said the human brain has evolved to process stories, which are "a shortcut for presenting information in a compelling way." He defined a story as an account of events that has a beginning, middle, and end and that regards characters experiencing conflict. He noted that stories can have various structures, and that different ones are preferred in different cultures; he said to be intentional in choosing a structure. "Stories are memory aids, instruction manuals, and moral compasses," he said.

Longtime filmmaker Maggie Stogner, who is Executive Director of the Center for Environmental Filmmaking, American University, contrasted the media landscape in previous eras and now. Previously, she said, the media were expert-centric, top-down, passive, individual, serious, and single-author. Now, she observed, they are user-centered, distributed, participatory, social, playful, and co-created. Stogner presented 3 questions to consider in storytelling: Which approaches and emotional tones will engage and motivate the audience? Which relatable characters can produce empathy and trust? And which current media platforms will reach the target audience?

To demonstrate gearing a story to the audience, Sheline showed excerpts of 2 videos from the 2019 National Geographic expedition to Mt. Everest: one for a general adult audience, the other for middle schoolers. Next came an exercise in which small groups brainstormed about creating videos to engender change. The session ended by noting sources of further information. The Center for Environmental Film website is at https://www.american.edu/soc/environmental-film/, and case studies regarding impact of science filmmaking can be accessed at https://www.cefimpactmedia.org/.

Building Trust: Telling Stories That Connect and Inspire

Storytelling also was a theme of another workshop, featuring 2 speakers from HHMI Tangled Bank Studios (a production company associated with the Howard Hughes Medical Institute and dedicated to storytelling about science and nature).

To illustrate the point that providing data may not suffice to change behavior, speaker Reyhaneh Maktoufi told the story of having dated a "horrible person." Although she knew that dating this person didn't make sense, emotional and social factors delayed her ending the relationship. Likewise, she noted, more than facts affect people's attitudes and actions regarding issues such as climate change and vaccination. She indicated that regardless of whether an issue is personal or scientific, being a good listener and establishing trust can help.

Maktoufi also presented highlights of studies relating to trust. In one study, by Susan T. Fiske and Cydney Dupree, people rated various occupations regarding members' competence and warmth. Scientists and engineers were rated as high in competence but medium in warmth. The goal, Maktoufi said, is to score high on both dimensions. Another study, by John C. Besley and colleagues, identified 4 elements contributing to public perceptions of scientists' trustworthiness: competence, integrity, benevolence, and openness.

Alexandra Pearson then presented "Audience 101": a set of items to consider when customizing communications to an audience. The items were the audience segment

CONTINUED

to reach (and the reason to do so), "grassroots versus grass tops" (for example, whether community members or policymakers are the target audience), allies and fans (parties that can help one succeed), and adversaries and skeptics (parties that may stand to lose and that may hinder efforts).

The last part of this workshop featured clips from 3 documentaries showing relatable individuals in the sciences. The first individual was a park ranger empathetically mediating a situation in which elephants were important to the ecosystem but were damaging farms, thus angering residents in her locale. The second individual was an entomologist identifying himself as Black and queer and using pop culture references. And the third was wildlife filmmaker Martin Dohrn humbly observing bees in his backyard during the pandemic and producing the documentary "My Garden of a Thousand Bees."

AAAS Kavli Science Journalism Awards

Dohrn's "My Garden of a Thousand Bees" won a 2022 AAAS Kavli Science Journalism Award. During the 2023 AAAS meeting, Dohrn and the other recipients of these awards were honored in a virtual ceremony. Among those honored were journalists from Australia, China, Germany, India, South Korea, and the United Kingdom, as well as the United States. Awards were given in various media categories and for science news for children.

The ceremony, featuring videotaped remarks from the recipients, can be viewed at https://www.youtube.com/watch?v=ar63ULxfirM, and information on the winners is posted at https://sjawards.aaas.org/awards/field_award_year/2022-151. Many of the winning entries are openly accessible.

And More

The 2023 AAAS meeting also included many other communication-related sessions. Among those not covered in this report: "Communicating Evidence of Life beyond Earth with Societal Actors," "Projects with Purpose: Telling Stories about Why You Care," "Climbing the Hill: Science Communication with Congress and Other Policymakers," "Stories Grow in the Lab: Develop Your Science Storytelling Program," and "Inclusive Science Communication, Scientists, Media, and 'Fake News.'"

Most of the meeting focused on topics in science or in science policy. Some sessions in these areas, too, touched on communicating science. Examples included the plenary lecture "The Past, Present, and Future of Our Research Enterprise," by Marcia McNutt, President of the National Academy of Sciences and former Editor-in-Chief of the *Science* family of journals. McNutt noted that during her career, she has seen major changes in science communication, such as the growing use of preprints, the rise of open access (and predatory journals), and the increased acceptance—but still undervaluation—of scientists' involvement in public communication. Discussing the use of artificial intelligence in scientific publishing, she noted its value in identifying potential peer reviewers and thus increasing the size and diversity of the reviewer pool.

Another presentation featuring a deft communicator and touching on communication was "Transformative Science with the Webb Telescope," presented by NASA scientist Jane Rigby. Rigby described the telescope as an "engineering marvel … built by hand, lovingly, by a lot of people." Stating that the telescope was producing "shockingly good data," she said that papers were now rolling in; she said the papers thus far were mainly showing the telescope's capabilities, and that most of the discoveries were yet to come. In response to a question, Rigby said obtaining opportunity to use the telescope is based on peer review of proposals; she added that blind review, pioneered for the Hubble Space Telescope, has increased acceptance of proposals from postdoctoral fellows. When asked about the color in Webb Telescope images, Rigby said the telescope largely detects wavelengths invisible to humans, and she compared producing images from them to transposing on the piano. She said the telescope images used for public relations are enhanced but not scientifically changed.

The closing session—moderated by Holden Thorp, Editor-in-Chief of the *Science* family of journals—was titled "Doomed to Repeat: Why the History of Science Is Indispensable." And in closing, it was noted that the next AAAS annual meeting, themed "Toward Science Without Walls," is to be in Denver, Colorado, on February 15–17, 2024. With luck, learning from the history of the 2023 meeting will help make future content readily accessible, simultaneously or otherwise, beyond the conference walls.

Acknowledgments

I thank Duanduan Han and Julianne Hodges for reviewing a slightly earlier version of this report.

Reference and Link

1. https://meetings.aaas.org/2023-meeting-archives/

John Sack: Organizing the Community of Scholarly Publishing for Over 40 Years

Heather Staines and Tony Alves

From the early days of the World Wide Web, John Sack led HighWire Press from a fledgling technology organization based at Stanford University, to the premier content hosting platform for scientific and academic publishers. John is a scholarly publishing pioneer, innovator, and icon. In this interview, conducted by Heather Staines, Senior Strategy Consultant for Delta Think, John talks about how he became interested in technology via the old-fashioned card catalog, how Silicon Valley luminaries influenced his career path and approach to both organization and innovation, and how HighWire helped transform the scholarly publishing industry from a journal-based economy to an article-based economy. John also touches on how listening to diverse opinions can lead to innovative ideas, what he believes are the best uses for artificial intelligence (AI), and the benefits and drawbacks of remote work. This interview took place on March 30, 2023.

Science Editor: You spent a substantial part of your career connected to Stanford University, but I always wondered, how did you end up there, and what were your early days like at the university?

John Sack: Well, it's probably a 40-year story, but I'll try to make it more compact than that. I was an undergraduate at the University of Virginia in the 70s, and I was in an interesting program that allowed me to put together a mixture of studies in all sorts of areas. The upside was that it was a lot of fun, and I had some great professors, but I didn't look like an English major or a religious studies major. Even though I didn't look like what graduate schools were looking for, I did get into Stanford, and I was really excited to move from the east coast to the west. But when I got to Stanford, I found my interests were different from what was typical for a Stanford graduate student in English. Most of them were studying one major author. I was studying how readers read. My advisor eventually figured out that maybe I'd be happier doing something else. And she was right!

I was involved with technology almost from the start of my time at Stanford, which was pretty unusual for a grad student in English. I had to teach the rules of grammar to freshman English students. So, I got involved with computers, using early computer assisted instruction as a way of teaching students the rules of grammar. It turned out the students loved it. I also gave them email accounts, and back in the 1970s, email was a big new thing, and they loved that too. Their generation was ready to adopt technology tools when the PC revolution hit just a few years later.

But maybe even more important for reinforcing my own change in direction, I was doing research in modern poetry as part of my PhD program and went to consult a reference librarian to see if I had found everything there was to find in the card catalog. He turned to a computer terminal, and in 5 minutes he reproduced my 2 days of work flipping through cards in the card catalog. He had found things I had missed,

Heather Staines (https://orcid.org/0000-0003-3876-1182), Senior Strategy Consultant, Delta Think. Edited by Tony Alves (https://orcid.org/0000-0001-7054-1732), SVP, Product Management, HighWire Press.

https://doi.org/10.36591/SE-D-4602-08

CONTINUED

and I sorely needed to know what kind of computer program that was. Well, that computer program essentially launched my new career. It was an early database management system built by Stanford that supported natural language processing, so something like an early-stage Google. Coincidentally, this system was the basis for the first preprint database, built for high energy physics (predating and seeding arXiv). So, you might say, my career has come full circle from libraries back to supporting preprints in the sciences. Those are my early days at Stanford, getting into technology pretty quickly, and finding that technology—and particularly its uses in support of scholarship—was a better career path for me than becoming an English professor.

SE: While you were at Stanford, you met some folks who would become mentors to you over the years, and there are some names that people in the technology space will probably recognize. Can you tell us a little bit about some of those folks?

Sack: As a grad student at Stanford, I was formally being mentored by professors to become like them. But even when I left graduate school and became an administrator at Stanford, the same approach to mentorship applied. One of my earliest mentors as a young administrator at Stanford was a fellow named Don Kennedy. People who go back a bit in scholarly publishing will recognize that Don Kennedy later became the editor-in-chief of *Science* magazine. Before that, he was the provost and then the president at Stanford. One of the ways he conveyed to young administrators how to think about governance at a university was through mentorship: Don had a university "cabinet" with about a dozen of the most senior officers who would meet every week. Don would invite the next level reports of those senior administrators into the cabinet decision making, and into the board of trustees meetings, so that you could see how the university governance sausage was made. That was extraordinary because I got to see what values weighed in governance. To a very great degree, my approach to how to run organizations like HighWire, which exists for the service of scholars—just as Stanford does—came out of learning from Don Kennedy and his leadership cabinet.

I met my other major mentor while I was still a grad student. A grad student invited me to go on a visit to the Stanford Research Institute (SRI), where he was going to meet with a researcher to see how to build databases of text knowledge. In that meeting, I met someone who refocused my life in both business and intellectual terms. This was Doug Engelbart. People familiar with the history of computing will remember that name as a real giant in the history of computer technology. My friend and I went to Doug's lab at SRI, where we saw the first computer mouse. Doug was the inventor of the mouse, but Doug was also the inventor of windowed operating systems for text editing, early hypertext management systems, and early video conferencing. He is legendary for this. If you go to YouTube and look for "MOAD", the "Mother Of All Demos", you will see that in the mid 70s, Doug did a demonstration of networked video conferencing: full motion video with text editing and early hyperlinked documents. It just blew my mind. He made me think, "Oh yeah, I want to spend my time working on this." It was very important for getting me to think about the big uses and the big changes coming in technology. Doug's whole thing was about augmenting human intelligence, using the power of computers, not to just do payroll systems, but to make it possible for people to think bigger and faster.

SE: On the technology end, in those early days, the transmission of information electronically rather than physically was a big deal. Can you tell us a little bit more about how those connections were made in your brain in those early days.

Sack: One of the really exciting things going on in the early days of the PC and Mac revolution was happening at Stanford and MIT. Apple was hugely influential in those early days at Stanford, and I was lucky enough to be in meetings with Steve Jobs occasionally at Stanford. Jobs was essentially Apple's sales rep at Stanford, and Steve Wozniak was Apple's sales rep for MIT. Apple came up with the idea that if you put personal computers into the hands of students, they will become your future wave of adopters as they go out in the workforce. Stanford and MIT had Macs right from the start in 1984. As amazing as the Mac was, what really changed how I thought about the use of technology in research was when Apple introduced the laser printer. It was stunning because you could essentially send files across the Internet in email (the Web wouldn't exist for almost another 20 years!) to a laser writer that could print something out at 300 dpi that was pleasant to read, that was good enough to be compared to what was printed in a scholarly journal and a lot more conveniently accessible. Reading on screen was pretty unpleasant, at that time screens were 100 dpi, so they were just not pleasant to read with for very long. But the laser writer was like a desktop commercial printer. If I had a document I wanted to share with somebody across the country, like a scholarly article, I could just send it to them in email and they could print it out at relatively low cost. This gave rise, in my mind, to what became—with the Web and with HighWire press—the article economy. One article "just in time" on demand, not whole journal issues mailed to you or borrowed from the library.

SE: I want to hear more about how HighWire came about. There's an interesting backstory from your time at Stanford. Maybe you can set the stage for us.

CONTINUED

Sack: It's really one of the biggest coincidences of my career. I was a member of a hiring committee that was to select the next Stanford university librarian. The committee was chaired by Condoleezza Rice, who was provost. I was a member of the Libraries and Information Resources management team, and one of the ideas I had for librarian interviews was to actually engage with the candidates in solving a substantial problem. Take some big problem and work with them in a management team meeting to come up with solutions for that problem, rather than only have them deliver lectures to the audience of staff and faculty. The problem we decided to tackle with the candidates was the "serials crisis," which was a term used a lot in the 80s and 90s to describe what was happening with the prices of scholarly journals. Prices were going up and up and up and exceeding universities' ability to pay. In the team meeting with one particular candidate, Mike Keller, we essentially invented the idea of Stanford's creating a technology focus that could work among multiple scholarly nonprofit publishers to give them the technological organization that would use the new "web browser" tools to advance societies' abilities to communicate science; this was essentially HighWire Press. (We didn't at the time call it HighWire Press, I came up with that name a couple of months later.) After Mike was hired, I was no longer managing the Stanford data center. I became the director for HighWire Press, working for Mike as part of the Stanford Library and got to launch a pretty amazing Stanford intervention in scholarly publishing: essentially building a community of scholarly publishers around a technological focus, giving them the scale that the largest commercial publishers had, amassing the technologies they needed to move forward. This is right at the time that the Web was starting to flourish for the public. The Internet was long established, but this thing called a web browser was still pretty new in 1994 and 1995: You had to explain to people what "WWW" meant. Hard to believe now, but it was not obvious that the Web was the solution, and that articles were what people wanted to read rather than using apps to flip pages in a print-format journal online. We figured that out before others did, and we also put a natural-language search engine on the database of articles—this inspiration came from my early Stanford days using Stanford-built natural-language search engines.

SE: We first met via Mike Keller. I found out about SIPX, the Stanford Intellectual Property Exchange, and I think we probably met at a HighWire meeting in those early days. When I think HighWire, I think technology. But when we were getting ready for this interview you said it was the community that was the primary driver. Can you talk about how you saw that community, and how that community had an impact on the day-to-day operations during your time at HighWire?

Sack: The important thing about HighWire to me, was that it was not just a technological asset owned by Stanford University, it was a collective body of very significant scholarly publishers who happened to share in this technology platform. That was the good news. The bad news is it meant that you had to do a lot of collaborative decision making, which was something that I think I was pretty good at: getting people to gather around and make a decision that they were happy with together. This is something I had learned to do literally since childhood and as a teenager.

My first management position was as assistant manager at a country club when I was 19 or 20 years old. I was supervising staff who were in their 40s, 50s, and 60s. One of the things I learned is how to work with older and more experienced people to get them all to align to a common purpose. I didn't just order them to do something, especially since I was "the pipsqueak". I think management at Stanford University was somewhat similar in that the faculty were the giants in their fields, and you weren't going to tell the faculty what to do. This applied to the technology staff too—there was definitely a libertarian bent in tech in Silicon Valley then (and now). So, I had to gather very smart people, hugely individualistic people, and figure out what their common causes were and how to line everything up. Scholarly publishers are led by the same kind of faculty whom I knew at Stanford, and they had pretty similar ways of working together. Even the administrators at these leading scientific publishers had that same approach to working together. They wanted to work together, but they were also fiercely independent.

Leadership in this type of environment was more like community organizing, and I intuitively applied this kind of model to all my management roles, but especially to HighWire.

SE: You said you were often the littlest kid, so you had to become more of a persuader.

Sack: I grew up in a neighborhood where I was the pipsqueak. I mean, literally every kid was bigger than me; even my older sister was bigger than me. So, I didn't go and pick a fight with somebody. That was just not going to turn out well for me. So that's why I learned other models for getting things done: "community organizing". One of the members of the HighWire senior management team once told me, "John, you turn every problem into a community-organizing problem." I'm not sure if she meant that as a compliment or a complaint!

SE: It's really interesting how each thing you did led organically to the next thing that you were interested in. Your curiosity not only moved you in different directions, but it moved other people into that orbit to go forward and create things.

CONTINUED

Sack: Some people think I'm a smart person. Well, I don't know that I am. What I think I'm good at is talking to a number of people and listening to their best ideas and pulling those ideas together in a way that expresses the aspirational will of a community. I joked with you that maybe I was just version 0.01 of ChatGPT, pulling together ideas from across a very large information space. But if we had a problem to solve at HighWire, what I would do is talk to a lot of smart people; they were the staff if it was a technical problem. If it was a business problem, then I'd get on the phone and talk with the people who were most involved in it. That's where some of the seminal ideas at HighWire came from. The idea of toll-free interjournal links. I didn't come up with that, the publishers did. They had to convince each other that it was not a really dumb idea. "What? Give away my content? Send somebody a link from my article to somebody else's article? Why would I do a thing like that?" But they talked to each other, and they talked each other into it. What I did was facilitate those conversations, and provide technical solutions to the business challenges.

SE: I want to move on to what you're thinking about for the future, in terms of technologies that might change scholarly communications. We would love to hear what kinds of things you are keeping an eye on and why.

Sack: I like the idea of, "what are you keeping an eye on" rather than "what are you predicting will be the next big thing" because technologies have this roller coaster thing of going through a hype cycle of overestimating the short-term impact while underestimating the long-term impact. I think the whole point of scholarly publishing is to leverage collective intelligence. To make it possible for people to stand on the shoulders of people who have gone before and done experiments and so on. The thing that always interests me is what those technologies are that create the most leverage. Search engines are an obvious candidate, as is the Web itself. It is a large database of text, and it lets us borrow from each other in ways when there's a thread of evidence though hyperlinks.

The thing that is making me think these days about the levers is everything to do with AI. About 3 years ago, HighWire held a workshop for journal editors. Normally, we would work with the journal publishers, but this time we wanted to talk to the editors themselves, along with their publishing executives, about what they wanted from AI and what they did not want from AI. What we heard from them was pretty astute: that they wanted to be in control of outcomes. They didn't want the AI capabilities making decisions for them, but they wanted the AI capabilities to augment their intelligence and leverage their time. In other words, if you will think of AI as augmented intelligence, rather than artificial intelligence, they wanted help with some of the checking that goes on in manuscript review and editing, the stuff that is often being done by postdocs and young faculty who are slogging through some pretty detailed findings. That seemed like a pretty good candidate for AI under the control of those postdocs and faculty. Again, this was a few years ago. But now, the capability for AI to essentially write text and to create images, not just interpret them, seems to be a stunning leap. What you see if you've tried some of the tools is, when it's good, it's very, very good and when it's bad, it's just horrible. The problem is that it's learned from the Web, and we know that the Web is full of a lot of varied stuff. My fantasy is to be able to use a ChatGPT that's been trained on Google Scholar: A very good information base like that could lead to some very high-quality capabilities summarizing experiments and helping people read through large quantities of papers quickly while maintaining a trail of evidence and without leaping across evidentiary chasms.

The other thing that I've been looking at is something I've often labeled as "friction in the workflow". Interviewing scholarly participants, like researchers, to figure out where they're encountering rough spots in using the research literature, and then helping to smooth or eliminate those friction points. Our industry has focused a lot over the last couple of years on the friction point of authentication, in other words, "Here I am at home, how do I authenticate myself to the Stanford Campus Research database?" Without going through 5+ minutes of fussing and having to look up access IDs and VPNs and remember how to do something. I think those technologies are getting much simpler but are still necessary. I'm really proud to have done work in that area with Google Scholar.

SE: We're recording this interview remotely, and I know you've thought a lot about how collaboration tools like Zoom will enable people to work together at great distances, which harkens back to being able to print at great distances as well.

Sack: HighWire has often done researcher interviews. This goes back to some of my training at Stanford in ethnography, where you basically listen creatively to someone describe their world and figure out how their world works for them. (This is a completely different approach from sending out surveys where people would check boxes.) One of the things we did the second year of the pandemic was interview about 25 researchers—most of them early-career researchers—to figure out how the pandemic had changed what they were doing and how they were doing it. Because they couldn't be in their labs, a lot of them switched to writing up papers based on the results that they had when the lab shut down. Pretty predictable, but other things that we saw were how they were adopting tools for collaboration, and how they thought these tools were going to stick once the pandemic ended. Of course,

CONTINUED

we thought the pandemic was just about ending at the time; little did we know it had another 2 years to run.

Another of the things we learned was how theoreticians were doing their work: It was often face to face, where they would have a shared whiteboard, and I mean literally a physical whiteboard. One of them would walk into somebody's office and write on that whiteboard with them. How do you support that remotely? Well, Zoom has a whiteboarding feature, but boy is it awkward. Do you know anybody who uses it? I don't. So those kinds of collaboration tools got better and better. I don't know that they're good enough yet. But collaborating remotely took a leap forward.

We are still watching the return-to-the-office debates. I live off the Stanford campus, part of Silicon Valley. Is remote work as good as working in the office? Is it better? Is it worse? For what? For whom? But what about in research-lab situations, where labs that are remote from each other often collaborate. Have the general tools for collaboration taken a leap forward as the nonresearcher economy has forced improvements? Or are research groups inventing their own tools still?

There are certain types of jobs where remote work is really good, but there might be aspects of a particular project where it's really good if the team is actually sitting in a shared physical space, or has some other kind of collaboration tools that let you make sure they're all on the same page. What about early-stage startups? It's really handy to be able to hire anybody from anywhere in the world, but when you've got to solve a problem, how do you get everybody on the same page? It's not just about worker productivity, it's about the future of cities, the future of retail, the future of restaurants. Imagine that changing.

Shari Leventhal: Pitching in to Support CSE

Jonathan Schultz

Having worked at the American Society of Nephrology (ASN) for 20 years, Shari Leventhal has seen a lot of change in scholarly societies and scientific publishing. Beginning in the Communications department at ASN, Shari became a Managing Editor in 2012 for the *Clinical Journal of the American Society of Nephrology* (CJASN) and then the Executive Editor of the ASN portfolio of journals in March 2019. As she begins her term as the President of the Council of Science Editors, Shari spoke with Science Editor about her goals for CSE this year, the importance of accessibility, and the need to sometimes step up and get things done.

Science Editor: How did you get involved in scientific editing and publishing, and what career path led to your current position?

Shari Leventhal: My background was in communications, and I was working in public relations for ASN, but I didn't really love the pressure of being put on the spot. My supervisor at the time was looking for a second Managing Editor to assume oversight for the clinical journal, and believed that my skill set would be the perfect fit to manage the journal. When she approached me with the opportunity, I was intrigued. I love managing multiple projects at once and improving efficiency. Additionally, I had worked with the Editor in Chief previously and liked him quite a bit. I thought that if I was going to move into scholarly publishing, he would be a great EIC to work with.

SE: What do you enjoy most about your career? What challenges do you face?

Leventhal: I love working with my team at ASN to improve efficiency and identify potential resolutions to problems, especially within a submission system where system modifications can improve author and/or editor ease, time

to decision, and more. I am also extremely fortunate to work with fantastic colleagues and editors.

It is challenging to know that not everyone will agree and/or like all the decisions I make, but I am guided by knowing that I am making the best recommendations and decisions for the entire ASN journal portfolio.

SE: Let's shift a bit and talk about CSE. In May 2023, you're starting your term as CSE President. What has CSE meant to you and what are you looking forward to doing as president?

Leventhal: When I became a managing editor, I had no previous experience in scholarly publishing. CSE was recommended to me by my supervisor. I attended the Short Course for Publications Management and the Annual Meeting in 2012 and felt, for the first time in my professional life, that I had finally found my home, in terms of networking and education. Additionally, I finally understood that working in scholarly publishing was exactly where I was meant to be.

I am grateful to Mary (Billingsley) and Jennifer (Deyton) for the work they did during their presidencies to help prepare CSE for a fresh beginning in partnership with CSE's new management company, Riggs Enterprises and our Executive Director, Lauren Schoener-Gaynor and am excited to work with Lauren and all of the CSE Board and committee members to continue implementation of our strategic plan.

Jonathan Schultz (https://orcid.org/0000-0003-1030-5062) is Editor-in-Chief, *Science Editor*, and Director, Journal Operations, American Heart Association.

https://doi.org/10.36591/SE-D-4602-06

CONTINUED

SE: Are there areas of the strategic plan you intend to focus on?

Leventhal: Given its importance, when we developed the strategic plan, we wove diversity, equity, inclusion, and accessibility (DEIA) into the fabric of the plan. We're really looking at DEIA with a holistic approach across the entire strategic plan, ensuring that it touches every single committee and every single aspect of what we do at CSE.

SE: What are some of the biggest changes you've seen in the industry, and where do you see scientific editing and publishing heading?

Leventhal: ASN recently transitioned from self-publishing to commercial publishing. We are not alone in recognizing that it is becoming increasingly harder to navigate the changing landscape of publishing independently. Changes are happening rapidly in the industry in a variety of ways, including accessibility of articles and data, ethics, and more. I think accessibility is one of the largest areas where there is constant change. More than just being about access to specific content, it's about whether the article is visually (or audibly) accessible to everyone, that deposited data is accessible to other researchers, and that it is understandable to a broad audience when needed.

Additionally, authors have many choices of where to publish, and despite the changes and requirements, journals must continue to make their home a welcome place for authors.

SE: What skills, abilities, and personal attributes have you found to be essential to success in your job/this field?

Leventhal: I would say the number one skill that I remain committed to is customer service. If you can respond to people in a timely manner and provide helpful feedback, then that will go a long way. When I was just starting out in my career and attending an annual meeting—when I left for the airport until I got home—I was conscious that I was representing the society. I didn't necessarily know who I would see who was an ASN member. Having been at ASN for 20 years, I still have people that I may not necessarily remember, but they remember me from the annual meeting and continue to contact me for support. These meeting attendees are often authors, reviewers, editors, or readers, and they want to contribute to the society or an ASN journal, in part, because ASN helped them.

It is also important to have a willingness to just pitch in and get something done. If the team is taxed on something, it doesn't matter to me, whether it is a general administrative function or if it's something at a higher level, everything has to get done. If someone on my team needs help, then I'm going to pitch in and help them out to get it done. It's important to be able to multitask, have a passion for scholarly publishing and your organization, and a sense of humor.

SE: Can you tell our readers something that might surprise us about you?

Leventhal: My husband and I met on the dating site JDate and have been married for almost 19 years and have two sons, Henry (16) and Ryan (11).

SE: Wow, congratulations. As a final question, if we were talking this time next year, what would you consider to be a successful outcome for your presidency at CSE?

Leventhal: I think that if we can have a successful, well-attended Annual Meeting, Fall Symposium, and more regular webinars and short courses, and if all those events can happen in a timely, more consistent manner, then I'll feel like we've had a successful year. I also want to make sure that all our committee co-chairs feel supported and can accomplish what they want to do because we have a lot of volunteers who want to contribute in a positive manner and feel supported. It's been tough the last couple of years, but now that we have a strong association management company, I believe that we'll have a lot more opportunity to be able to implement all the programs that we want. If we can do that, I'll consider it a very strong and successful year.

Challenges and Opportunities in Open Research: Webinar Report

MODERATOR:
Ginny Herbert
Frontiers

SPEAKERS:
Guy Jones
Chief Editor of Scientific Data
Springer Nature Group

Rebecca Grant
Head of Data and Software Publishing
F1000

Tiago Barros
Managing Director
Faculty Opinions

Tom Ciavarella
Relationship Management, Business Development, and Content Strategy
Frontiers

Tracey DePellegrin
Executive Editor
GENETICS & G3

REPORTER:
Jessica McEwan
Managing Editor
Entomological Society of America

In January 2023, moderator Ginny Herbert of Frontiers gathered a panel of industry experts for a Q&A about open research. She kicked off the webinar with a deceptively easy question—What is open research?

Chief Editor of Scientific Data at Springer Nature Group, Guy Jones, took on the task of answering. Open research, he says, has a "reasonable amount of fluidity and diversity in the definition … depending on your domain or your area." Jones went on to explain the two primary definitions of open research. The *unified definition,* Jones says, broadly relates to "maximizing the availability, accessibility, visibilities, or transparency of scientific endeavors in general, without being too prescribed on which particular activities," with the wider goal of maximizing the value of research to those who need it, those who fund it, and humanity in general.

Jones continued by explaining the *collective definition* with "open research/open science as being the sum of its constituent parts. … Open access, the removal traditionally of paywalls and barriers; open data, which is more about open sharing; open source or open code, which is a little bit of both. Then you've got open protocols and open peer review, which are more about transparency on the administrative side."

Rebecca Grant, Head of Data and Software Publishing at F1000, agreed saying, "There is a kind of conflation or absorption of the concept of open science into open access. So, often … if you're working for a bigger publisher, … you hear people talk about open research quite a bit. But, actually, they do just mean open access and not the other more slightly obscure parts of it."

https://doi.org/10.36591/SE-D-4602-03

Next, Ginny Herbert asked the panel, "What do you make of the perceived friction between the open research movement and commercial sustainability?"

Tiago Barros, Managing Director, Faculty Opinions, laughed at the idea that there are still organizations with business models "with foundations that are anti-open science" and expressed that it is time for evolution toward "new business models that will be aligned with open science … rather than permanently trying to fight something that is of benefit to the community. And trying to get too attached to a business model that may no longer be tenable as research and science evolves." Barros offered an example of how removing paywalls naturally increases the number of people viewing content, and a larger audience of people interested and interacting with information increases business opportunities.

Tom Ciavarella, Relationship Management, Business Development, and Content Strategy at Frontiers, agreed saying, "No one is really against Open. If there's friction anywhere, it's open fast versus open slow. It's, 'I have a business model that's built on subscriptions or built on something else, and I know the world is going open, I just don't want it to go there yet.'" He continued by asserting "Wiley would not have spent $300 million to buy Hindawi if they didn't think there was something sustainable about the open infrastructure."

Tracey DePellegrin, Executive Editor, GENETICS & G3, spoke up saying "I always want to caution people about using loaded words like anti-open or even commercial versus non. I think we set up these false dichotomies, we take part in them, we see them, and we sometimes have to check our own biases and check ourselves because nothing is free. All of us could probably agree on that." She went on to describe society members who may have negative feelings about commercial/capitalistic activities, but who are affiliated with major educational institutions charging huge amounts of tuition and how we all pay for a good or service and "it would be helpful for everybody to find the commonalities and not pit one against another."

It was informative to hear the perspectives of people actively working to further open research in all its forms. The panelists made some interesting points, which can be accessed from the Council of Science Editors past webinars page here: https://www.councilscienceeditors.org/past-webinars

For a commentary on the topics discussed in this webinar, please see the Webinar Commentary article by Johanna Hoyos at https://doi.org/10.36591/SE-D-4602-02.

Challenges and Opportunities in Open Research: Webinar Commentary

Johanna Hoyos

On Jan 26, 2023, Ginny Herbert hosted the Council of Science Editors webinar titled "Challenges and Opportunities in Open Research," during which panelists discussed the concept of open science, the contributions of different scholarly publishing actors, challenges to open research, including consideration of non-academic factors such as Indigenous data sovereignty and protecting vulnerable populations, and to what extent current open research policies have made research more transparent and efficient. Panelists proposed a number of solutions to enhance research transparency and efficiency, such as San Francisco Declaration on Research Assessment (DORA),[1] CARE principles for indigenous data governance,[2] and initiatives like NASA's The Year of Open Science[3] providing an open research platform, establishing an open access university press, offering expert advice and data science resources, and providing funds for open access publishing. Panelists acknowledged that research and academic publishing have long traditions, and these traditions can be difficult to break. To encourage researchers to adopt open research practices, they posited that institutions must provide support and infrastructure for open research. Additionally, they suggest institutions should profile open research ambassadors, publicize open access articles, run training and engagement programs for early career researchers, and incentivize open research practices through grant funding, awards, and staff promotion criteria. Although there are still challenges to overcome, the panelists highlighted the potential of open research to benefit not just the research community, but society as a whole.

Open access has moved from the domain of disruptive technology to an increasingly adopted approach to research dissemination over the past 10 years. Universities in countries around the world have passed open access policies and are incorporating open access into the way in which they capture, collect, and disseminate researcher output. In addition, research funding organizations and national governments are pushing for public access, open access, and open data. The open access movement continues to gain ground with policymakers, researchers, students, and librarians, and new tools and initiatives are emerging to develop a truly global, interconnected research information system. While open access advocates continue to push for faster access, broader reuse rights, and open data, the challenge of raising awareness among researchers and addressing misconceptions still remains. As open access becomes more broadly accepted and endorsed, I argue that it creates opportunities for organizations and researchers to share research more widely and to engage with research communities in new ways for the benefit of patient safety and research efficiencies, among other goals.

The research workflow is fragmented and complex, involving multiple stakeholders with different systems and data sources. To address this, initiatives for an open and connected research ecosystem are gaining traction, such as advancements in scholarly communication to increase research impact and ease the burden on libraries, researchers, and research administrators. To move forward, potential directions include methods for easier and more transparent reuse of data and metadata and the development of open research platforms that allow simpler connectivity with other systems. I believe that academic institutions, libraries, vendors, industry organizations, journals, and the research community have the potential to influence and further advance the open research mission.

The call to change the system in which scholarly knowledge is created and accessed is clear, but the complexities of such a system can make it difficult to understand. The challenges associated with understanding large information ecosystems and the scientific information ecosystem in particular can have a huge impact on society and academia. Information science has the opportunity to further explore these challenges, but relevant research is spread across many other communities. This means that collaboration is necessary to gain a better understanding of the system and find innovative solutions to any issues that may arise. Ultimately, I believe that the knowledge ecosystem should be open, accessible, and free of politics.

Johanna Hoyos, MSc, Senior Director of Operations at the Center for Biomedical Research Transparency (CBMRT).

https://doi.org/10.36591/SE-D-4602-02

CONTINUED

Panelists also discussed language, which is not often considered within the context of open research, but is equally important. English has become the de facto global language of science, granting access to a vast reservoir of scientific literature to researchers around the world. However, this shift has also created distinct challenges for those who are not native speakers of English, who must struggle with the nuances of the language to communicate and be heard in the scientific community. Scientific knowledge is often unavailable in local languages and having the dominance of English language journals inhibits diversity and inclusion, which in turn limits the ideas that are being shared, influencing which research gets funded and rewarded. I challenge researchers, manuscript reviewers, and journal editors to work together to minimize these obstacles, making science more accessible and fostering international scientific communication. Ultimately, it is up to all members of the scientific community to work together to eliminate language barriers and advance scientific progress. In my opinion, this will lead to fresh perspectives on research and fresh insights into the world and humanity.

For more on this webinar, please see the Webinar Report article by Jessica McEwan at https://doi.org/10.36591/SE-D-4602-03.

References and Links

1. https://sfdora.org/about-dora/
2. Carroll SR, Herczog E, Hudson M, Russel K, Stall S. Operationalizing the CARE and FAIR Principles for Indigenous data futures. Sci Data. 2021;8:108. https://doi.org/10.1038/s41597-021-00892-0
3. https://science.nasa.gov/open-science/transform-to-open-science

Generative AI: The Promise and Peril for Scientific Publishing

SPEAKERS:

Chirag Jay Patel
Head of Sales (Americas)
Cactus Communications

Emilie Gunn
Director, Journals
American Society of Clinical Oncology

Avi Staiman, MA
Founder & CEO
Academic Language Experts

MODERATOR:

Jonathan Schultz
Director, Journal Operations
American Heart Association

REPORTER:

Tony Alves
SVP Product Management
Highwire Press

For the session "Generative AI: The Promise and Peril for Scientific Publishing," moderator Jonathan Schultz introduced the panelists and the topic. Schultz noted that artificial intelligence (AI) and tools like ChatGPT have begun to change the creation and dissemination of scholarly research. Publishers have a responsibility to guard against the abuses and misuses of AI, such as plagiarism and paper mills, as well as the biases and hallucinations inherent in the current AI tools. The first speaker, Chirag Jay Patel, is Head of Sales in the Americas for Cactus Communications. The second speaker, Emilie Gunn, is Director of Journals at the American Society of Clinical Oncology. The third speaker, Avi Staiman, is Founder & CEO of Academic Language Experts.

Jay Patel provided an overview of the AI landscape in 2023, noting that there are more than 1400 companies that are involved in AI, creating new technology and building on existing technology. He addressed, "What is Generative AI?" by explaining that AI is used to create new content using deep learning models. It is not just creating written content, it is also being used to create artwork, music, computer code and more. A positive way to look at the capabilities of AI is to see it as enhancing human creativity.

Investor interest in AI has soared, with investment growing from $27 million in 2020, to $2.6 billion in 2022. Patel showed that there is heavy investment in applying AI to creating social media and marketing content, content summarization, photo and video editing, and audio editing. The biggest benefactor of this investment has been OpenAI, which had a $20 billion valuation in 2022, followed distantly by Hugging Face, Lightricks and Jasper, with a combined valuation of approximately $5.5 billion.

Patel highlighted the benefits of AI, which can give an organization a competitive edge, especially in the area of client satisfaction, by providing the following: automation of content creation, improvement in responses to technical queries, the ability to summarize complex ideas into an easy-to-understand narrative, standardization of style and format, increased productivity, and personalization of customer experience. He also highlighted the following limitations of AI: there is a lack of original and creative thought; the training data can be biased; there are ethical issues, such as plagiarism; and there may be ownership and copyright concerns.

Wrapping up his talk, Patel talked about how humans and AI can work together, introducing the CENTAUR Model, a hybrid of human and AI intelligence. It is unclear who came up with this concept, but the model combines the strength of both humans and machines for better decision making. Humans provide strategic guidance and intuition, whereas AI provides analytical and computational capabilities. Although humans provide input, AI makes recommendations based on the data; however, in the end, humans make the final decisions. Patel advises, "Don't be afraid of AI, use it by finding tedious things in your daily life that you can automate using AI."

Emilie Gunn continued the discussion by describing how her organization went about creating a policy for AI in their journal publishing program. She started by showing an image of a manual typewriter with the caption, "Do you feel like this?"; followed by an image of the Microsoft "Clippy" character with the caption "Does ChatGPT feel like this?"; followed by a picture of the Terminator robot with the caption "Or like this?"; then finishing with an

Help Your Editors Understand

- What are other publishers doing?
- Why they may be against the use of LLMs/AI?
- What are the potential uses for LLMs/AI in their field? In publishing?
- Are there any situations or uses that may be acceptable to them?

CONTINUED

image of a robot hand and human hand touching fingers, like the Michelangelo "Creation of Adam" on the ceiling of the Sistine Chapel, with the caption "Maybe more like this." Gunn uses this juxtaposition of imagery to emphasize that AI is just a more modern version of something we are already familiar with. AI does not have to be intrusive or scary; it can be something we learn to work with and utilize.

Gunn recalled a meeting where she discussed the use of AI and large language models (LLM) with editors, some of whom expressed serious concern—even advocating a ban on their use. Gunn pointed out that journal staff need to help editors understand how AI and LLMs are currently being used. It is useful to engage them in a discussion as to why they may be against the use of these technologies. Part of that may be to ask them about potential uses in their own fields, and to explore if there are any situations or uses that may be acceptable.

When developing policies around the uses of AI and LLMs Gunn advised keeping the policies broad and general, noting that you will not be able to address every use of these technologies. Think in terms of categories (e.g., uses, users, article types, etc.). Do not put a value judgment on the uses. Be clear about expectations; for example, where, when, and how should authors describe the use of AI. Also, there are good reasons to forbid their use. For example, with AI there are issues with accuracy and the potential for plagiarism and the fact that machines cannot meet the requirements of authorship. Gunn also reminded the audience that sometimes the voice of the author is an important element, and this can be lost in AI. Finally, once you have set your policies around the use of AI and LLM, think about how it will be announced, what actions you will take if you suspect an author has violated your policies, and how AI could be used for reviewers and editors.

The third speaker, Avi Staiman, broadened the discussion by talking about the use of AI in research. First, he compared ChatGPT to Wordle, proclaiming it to be Wordle on steroids. Similar to a person solving Wordle, ChatGPT fills in the blank spaces. ChatGPT is an autofill; it looks at big, complex text and guesses the next word. He asked, "Why do we have such an emotional reaction to AI and ChatGPT?" It is because ChatGPT and other LLMs are a quantum leap forward. AI has been around for a long time, but ChatGPT is different because it has the power to displace information workers and impact our knowledge economy. However, it is important to understand the capabilities of these tools; they provide us with words, not facts.

Staiman discussed how researchers are currently using AI. One important use is that it levels the playing field for scholars whose first language is not English, using it for translation, editing, drafting abstracts, and practicing writing. Another use is as a cooperative research advisor. It can provide grant ideas, suggest experimental techniques, assist in data analysis, and point out new areas of research. However, Staiman warns that you need to be careful because not all information will be accurate. He asked ChatGPT to critique his presentation and it was both helpful and provided bad advice. He warns that you need to think about your level of tolerance for mistakes, and to realize that humans make mistakes too. A third use is as a research assistant, providing a literature review and summaries of the literature. A fourth use is as a personal peer reviewer, reviewing manuscripts and grant applications, ensuring your research is novel, and identifying gaps. Finally, AI is being used as a personal publicist, creating social media posts, blog posts, email newsletters, online profiles, and other sorts of media engagement.

Having discussed how researchers are using AI, Staiman cited a Springer Nature survey that reveals that 80% of responding researchers have used ChatGPT. The conversation needs to now focus on the following: 1) What are the responsible/productive uses of AI tools in research and 2) How can we encourage responsible AI use among authors?

Partnering to Improve Equity in Publishing

SPEAKERS:
Sowmya Swaminathan (she/her/hers)
Head of Collaborations & Chair
Springer Nature Research & Solutions DEI Programme
Springer Nature

Allison Leung (she/her/hers)
Assistant Director
Researcher Products & Engagement
American Chemical Society

Dorraya El-Ashry
Chief Scientific Officer
Breast Cancer Research Foundation

Antonio Baines (he/him/his)
Associate Professor
North Carolina Central University and University of North Carolina-Chapel Hill

SPEAKERS:
Sowmya Swaminathan

REPORTER:
Pablo Luis Clemente
Assistant Managing Editor
Proceedings of the National Academy of Sciences

The scientific publishing community must "push toward greater equity in publishing and research at large," said moderator Dr Sowmya Swaminathan, Head of Collaboration & Chair, Springer Nature Research & Solutions DEI Programme, to start this session at the CSE 2023 Annual Meeting. Referencing the recently released National Academies (NASEM) report[1] on Advancing Antiracism, Diversity, Equity and Inclusion in STEMM organizations, she noted that it is the responsibility of individuals or organizations who have power and influence—described as "gatekeepers" in the NASEM report—at publishers, funders, and societies to develop and implement policies and opportunities for historically excluded researchers to participate equitably in scientific discourse across all areas of research. Along with her panel of speakers, the message was clear: Creating an effective ecosystem of lasting, meaningful partnerships with organizations and institutions that employ and recruit largely from historically marginalized and excluded populations is absolutely necessary to boost their participation in scientific research and publishing. It is a problem that has wider implications on research and the types of research that can help address and diagnose issues affecting these communities and society at large.

https://doi.org/10.36591/SE-D-4602-14

That said, these partnerships cannot be a one-way street, as aptly stressed by Dr Antonio Baines, Associate Professor, North Carolina Central University and University of North Carolina-Chapel Hill. As a cancer biologist, it is not lost on him that he studies a disease that directly or indirectly affects millions of people and families around the world (myself included) regardless of background, race, gender, or identity. Therefore, it is imperative that research institutions work together to communicate and study these issues effectively and not devalue institutions that represent marginalized groups such as Historically Black Colleges and Universities (HBCUs), of which Dr Baines is a proud graduate and professor. These institutions, in particular, must be respected for their significant contributions and expertise in multiple areas of research, especially as they have some of the highest success in producing Black STEMM (science, technology, engineering, mathematics, and medicine) graduates and training Black students for future careers in STEMM.[1-3] Therefore, collaboration must not be a one-sided opportunity to "check a box" for achieving a diversity, equity, and inclusion milestone. Rather, it should be a mutual agreement from the beginning among organizations and institutions, where they can learn from each other and partner on issues pertinent to the research they conduct and the communities the research affects. Dr Baines' example of the collaborative project "Exploring Cancer"[4] gave an excellent sense of how this collaboration can achieve such an impactful goal. As he put it, without "all hands-on deck" to mutually collaborate on critical research, we will be less prepared to bring about the meaningful changes needed to address real-world problems head-on across our communities.

The statistics only emphasize the immense work needed to tackle the problem. Citing data from the aforementioned NASEM report, Dr Swaminathan noted that 91% of university and college faculty identify as White, and that, although Black, Hispanic, and White students declare their STEMM majors at roughly the same rate, 40% of Black students switch out of STEMM majors before earning their degree.[1] In terms of research funding, the numbers were even more staggering: 69.5% of NIH R-01 grantees identified as White, 23.9% as Asian, 4.8% as Hispanic and only 1.9% as Black or African American.[5] Although the statistics within the publishing industry were not available, there is an assumption that many publishers face this same problematic trend internally and throughout their editorial boards.

CONTINUED

So how can the gatekeepers for publishers, funders, and societies make more meaningful partnerships that serve to improve equity within their organizations? Dr Dorraya El-Ashry, Chief Scientific Officer, Breast Cancer Research Foundation (BCRF), and Allison Leung, Assistant Director, Researcher Products & Engagement, American Chemical Society (ACS), are both attempting to address this question within their respective institutions and spheres of influence.

Within the funding and society spheres of influence, Dr El-Ashry shared that BCRF is focusing on a two-pronged approach at BCRF to support historically excluded groups by 1) leveraging BCRF's current society partnerships to focus on increasing diversity in the early-career breast cancer investigator pipeline and increasing the diversity of the BCRF investigator portfolio with new invitations to established breast cancer investigators, and 2) investing in research focused on addressing disparities. For example, early and mid-career funding requests for applications are specifically targeting historically excluded groups by leveraging the funds BCRF sends annually (~$2 million for ~20 investigators) to their current partner societies. Through these initiatives, 8 senior investigators from historically excluded groups were added for biomedical research in 2022/2023, and they expect to fund new investigator applications this year with the same focus. In tandem with these efforts, investments are being made in disparities research to prioritize issues that directly affect marginalized communities. These include research focusing on breast cancer in Black women and disparities in mortality rates, among other areas of research. Additionally, in collaboration with Springer Nature, BCRF is funding master classes focused on manuscript preparation and communicating science to diverse audiences, specifically targeting researchers at HBCUs, Hispanic Serving Institutions, and other organizations such as Women in Research. As of April 2023, BCRF and Nature have conducted 5 workshops to 134 participants and 33 partnered institutions.

Within the publishing and society spheres of influence, Allison Leung has led a multifaceted approach to addressing inequity at ACS by providing opportunities at various stages of education and expertise. ACS's core value of diversity, equity, inclusion, and respect drives that effort as both a society and a publisher. As a society, ACS partners with individuals in economically challenged and historically excluded groups: Their Project SEED provides internship opportunities for students from economically challenged households; their ACS Scholars program awards more than $1 million in yearly scholarships to undergraduate African American/Black, Latino or Hispanic, and Indigenous students; and their ACS Bridge Program establishes links

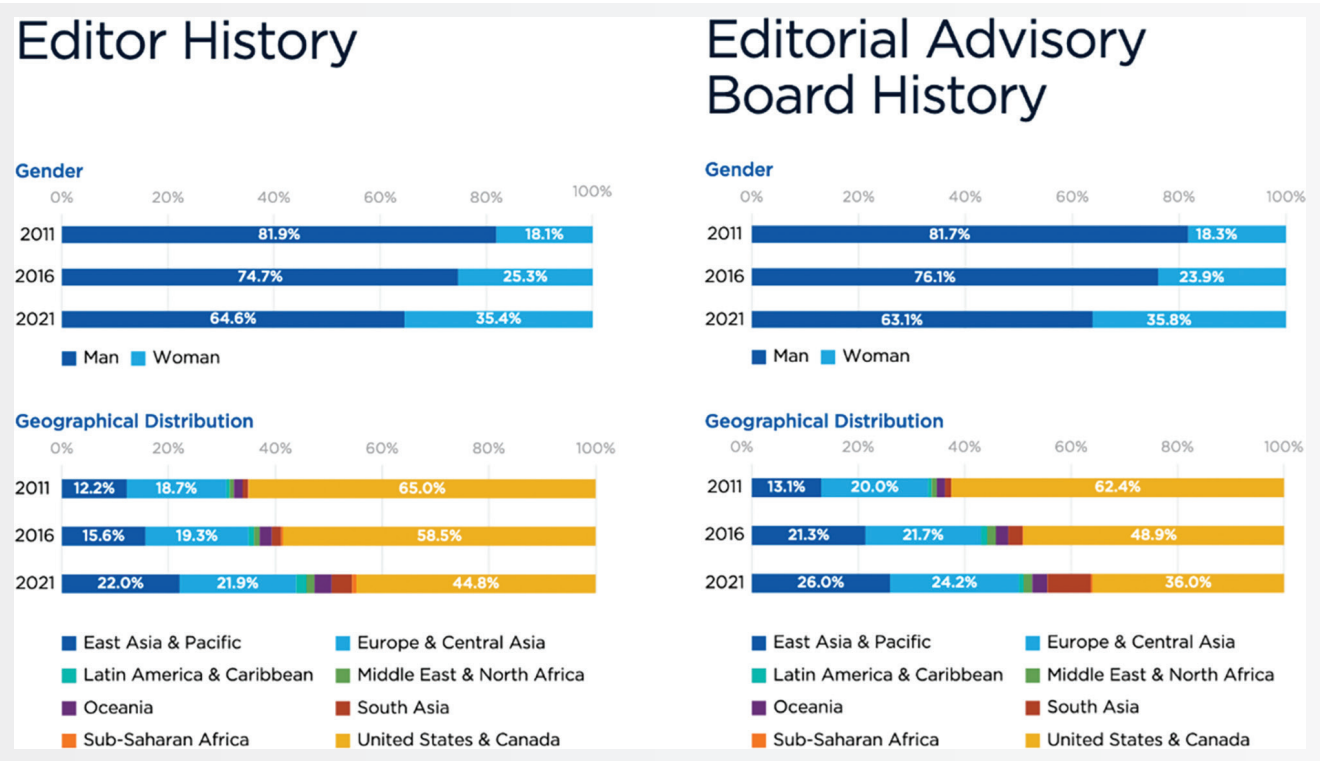


Figure. American Chemical Society Diversity Data Report.

CONTINUED

between minority-serving and doctoral-granting institutions to boost chemical sciences degrees for Black, Hispanic, and Indigenous students.

As a publisher, ACS focuses on internal and external issues. They update their policies and practices to ensure they are intentionally inclusive, seek diverse perspectives from their contributors, and seek to minimize bias in all aspects of their editorial processes to reduce barriers and enable higher success rates. Most interestingly, ACS provides educational resources to its authors and reviewers through their ACS Author Lab and ACS Reviewer Lab, respectively, in order to help them write scientific papers and reviews and, in the case of reviewers, navigate sensitive ethical issues they may come across. They also partner with academic institutions to assist researchers at all stages in a program called ACS on Campus. Finally, ACS has implemented journal initiatives to focus special issues on more diverse voices and provide early-career researchers with opportunities and experience serving as topic editors and on early-career boards.

There are shortcomings to these approaches, and there is always more work to do. In Dr El-Ashry's case, their funding can only reach so far down the pipeline to secure investigators in their early years of research. Applicants are not always there, however, and they are looking for ways to impact individuals at earlier stages. At ACS, as in much of the publishing landscape, their editor and editorial board pool skews mostly male from the United States and Canada (Figure).[6] While this has improved in the last 10 years, as they continue to reach more diverse voices through their various initiatives, it will be interesting to see where these statistics stand in another 10 years. By then, hopefully demographic data collection will be much more robust to provide more exact measurements and trends.

It is motivating to see what these gatekeepers in publishing, funding, and societies have accomplished to bring diverse voices to the table of scientific publishing and partner with historically excluded groups and organizations. I am interested to see how these efforts will help shape the publishing landscape moving forward. There will always be work to do on this front, and this panel has provided wonderful frameworks for how publishers, funders, and societies can make a difference within their organizations and across publishing. Even so, as Dr Baines noted, in many of these cases, all of these historically excluded individuals and institutions need is for someone to come to them and begin a dialogue.

References and Links

1. https://nap.nationalacademies.org/resource/26803/interactive/
2. https://uncf.org/the-latest/the-impact-of-hbcus-on-diversity-in-stem-fields
3. https://files.eric.ed.gov/fulltext/EJ1000229.pdf
4. https://learn.unclcn.org/content/exploring-cancer
5. Bernard MA, Johnson AC, Hopkins-Laboy T, Tabak LA. The US National Institutes of Health approach to inclusive excellence. Nature. 2021;27;1861–1864. https://doi.org/10.1038/s41591-021-01532-1
6. https://pubsdiversity.acs.org/data/2022/index.html

CSE Guidance on Machine Learning and Artificial Intelligence Tools

Jill Jackson, Glenn Landis, Patricia K Baskin, Kelly A Hadsell, and Michelle English on behalf of the CSE Editorial Policy Committee

In late 2022, Open AI introduced ChatGPT, an artificial intelligence chatbot that could answer questions quite eloquently. The scholarly community was concerned how this would affect the publishing landscape. Several questions arose, such as can a chatbot be an author on an article? How do we acknowledge artificial intelligence in work? The CSE Editorial Policy Committee and CSE members came together to propose advice for the community. The following are recommendations for journals and the editorial team to consider in this new world.

Machine Learning and Artificial Intelligence (AI) tools (such as ChatGPT or chatbots) should not be listed as authors because a nonhuman cannot be responsible or accountable for the accuracy, integrity, and originality of the work, and these responsibilities are required for authorship as outlined in the section on Authorship in the Recommendations for Promoting Integrity in Scientific Journal Publications[1] and the ICMJE Roles and Responsibilities for Authorship.[2] AI-assisted tools are unable to hold or transfer copyright.

Authors should disclose usage of AI tools and machine learning tools such as ChatGPT, Chatbots, and Large Language Models (LLM). CSE recommends that journals ask authors to attest at initial submission and revision to the usage of AI and describe its use in either a submission question or in the cover letter. Journals should have an explicit policy (preferably included in the Information for Authors) about the use of AI-generated text and images. Journals may want to ask for the technical specifications (name, version, model) of the LLM or AI and the method of the application (query structure, syntax). Ultimately, human authors must be accountable for all aspects of a manuscript, including the accuracy of the content that was created with the assistance of AI, the absence of plagiarism, and for appropriate attributions of such sources.

Tools to detect AI-generated text are becoming available in this evolving field. Until they can be applied widely, journals must rely on the author to properly disclose and detail the use of AI-assisted tools in their work. This section will be updated as new information about detection tools is available.

References and Links

1. https://www.councilscienceeditors.org/recommendations-for-promoting-integrity-in-scientific-journal-publications-
2. https://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html

Jill Jackson took the lead in authoring these sections along with Glenn Landis, Patty Baskin, Kelly Hadsell, and Michelle English and on behalf of the CSE Editorial Policy Committee. This section was approved by the CSE Board of Directors on April 6, 2023, and will be added to the CSE Recommendations for Promoting Integrity in Scientific Journal Publications in the near future.

https://doi.org/10.36591/SE-D-4602-07

The Intersection of Diversity, Equity, and Inclusion and Open Access in Scholarly Publishing:

A Summary from the Ecological Society of America's Workshop on Exploring Barriers and Solutions

Erin C Landis, Leonard Jack, Jr, and Amy King

The intersection of diversity, equity, and inclusion (DEI) and open access (OA) is a subject the scholarly publishing community has begun to earnestly grapple with in recent years. The focus is to identify barriers to equitable opportunities, how to better understand which principles of social and racial justice and inclusivity can be applied to promote equitable access to scholarly research and knowledge, and strategies to promote equitable opportunities in scholarly publishing.[1] By promoting diverse representation, addressing equity barriers, and fostering inclusive practices, DEI principles can be integrated into OA initiatives to promote a scholarly ecosystem that is accessible to, inclusive of, and representative of all.[2]

Over the course of a day-and-a-half workshop (February 1–2, 2023) organized by the Ecological Society of America (ESA), with funding from the National Science Foundation and hosted by the American Geophysical Union (AGU) in Washington, DC, thought leaders who care deeply about this issue convened to share their perspectives, wrestle with difficult questions, and develop ideas for how to move the community forward in a more unified direction in terms of diversity, equity, inclusion. Diversity, in the context of this workshop, refers to racial and ethnic diversity, gender diversity, and/or other forms of diversity. The following is a summary of the workshop's presentations, written by 3 members of the Council of Science Editor (CSE) Diversity, Equity, Inclusion, and Accessibility (DEIA) Committee who attended the workshop. The goal of this article is to provide those who were not in attendance a general overview of the workshop's purpose, key take-away messages, and action steps conveyed during the workshop.

Erin C. Landis is Managing Director, Origin Editorial. Leonard Jack, Jr, PhD, MSc (https://orcid.org/0000-0002-4342-5696) is Editor in Chief, *Preventing Chronic Disease* and is with the Office of Medicine and Science, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention. Amy King is Senior Editorial Coordinator, American Society of Clinical Oncology.

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Opinions expressed are those of the authors and do not necessarily reflect the opinions or policies of the Council of Science Editors or the Editorial Board of Science Editor.

https://doi.org/10.36591/SE-D-4602-11

DEI and Scholarly Publishing

Joseph Stephan, President of Broadview Analytics, set the foundation for the workshop by presenting his company's research on the barriers authors face in publishing. He conducted this research on behalf of the ESA; 842 ecologists from 64 countries participated in an online survey. The results showed that while more than half of early-career researchers (ECRs) in ecology identify as female, representation declines with career advancement. Additionally, Hispanic, Asian, and Black ecologists only represent 1/7 of ECRs. Furthermore, the number of non-European/US/Canadian authors steadily grows in the early stages of academia but then fades after 20 years of experience. Stephan noted that a significant barrier for emerging authors is finding funding for article processing charges (APCs). This is especially true for authors of historically underrepresented groups.

The first panel of the workshop focused on the broad theme of the intersection of DEI and OA publishing. Charla

Lambert, DEI Officer of Cold Spring Harbor Laboratory, discussed the importance of diversity in science and academic faculty, citing innovation, representation, and improved student outcomes as the primary drivers. She explained that certain groups are underrepresented in biomedical/biological research in the United States, including some racial and ethnic groups, women, persons with disabilities, and first-generation college students and/or persons with low socioeconomic status. This underrepresentation gets at the "D" (diversity) in DEI. What underrepresentation does not capture is the "E" (equity) and "I" (inclusion) in DEI. Research shows that workplaces generally have not been inclusive of other groups, even in the absence of long-term underrepresentation. Lambert suggested that we should instead think of diversity as the outcome of strong outreach combined with equitable systems and inclusive environments. She concluded her talk by using the grants process as an example of the many biased systems that exist in academic science.

Following Lambert, Leonard Jack Jr, PhD, MSc, editor-in-chief *of Preventing Chronic Disease* (and a co-author of this summary), gave an overview of the rationale for and the work being done by the CSE's DEI Committee, for which Jack serves as Founding Co-Chair (at the time of the workshop). This year, the primary outcome of CSE's DEI committee is the creation of a webpage[3] on CSE's website that features DEI scholarly resources. This webpage was created to make these scholarly DEI resources available in one location. Currently, over 50 resources in the following categories are available: 1) DEI Committees of Trade and Professional Organizations in Scholarly Publishing; 2) DEI and Peer Review; 3) DEI Statements and Policies from Journals, Trade and Professional Associations, and Publishers; 4) Bias, Discrimination, and Racism; 5) Data Collection on Diversity, Equity, and Inclusion; 6) Reporting Sex, Gender, and Race in Publications; and 7) Inclusive Language Communication.[3] Jack pointed out that there is considerable overlap across resources available in the 7 categories. Jack concluded his presentation by sharing key takeaways from his review of resources included in the DEI resources webpage. Four key take-aways included the need to 1) ensure transparency around DEI efforts that journals undertake; 2) acknowledge delays and missteps related to DEI practices; 3) generate and make available new resources on how to identify and address bias, racism, and discrimination in scholarly publishing; and 4) identify appropriate ways to evaluate the impact of DEI best practices in scholarly publishing.

The panel was rounded out by presentations from Sara Rouhi, Director of Strategic Partnerships, and Kristina Martin, Chief People & Equity Officer, at PLOS. Rouhi and Martin explained there is an immunity to change in scholarly publishing because of competing commitments: "selectivity (community-agreed-upon standards on rigor, ethics, and methods), expertise (experts evaluate each other's work based on agreed-upon community standards), and credibility (expertise and successful navigation of selectivity breeds credibility, which feeds the cycle)."[1] These commitments then mask the behaviors that compete with DEI (selectivity masks exclusion, expertise masks righteousness, and credibility masks status). Rouhi and Martin argued that the major stakeholders in scholarly communications—government/policy makers, academia, funders, and publishers/technology companies—must engage in adaptive introspection to examine underlying commitments, asking how such commitments advance or prevent equity. They ended their talk with a series of thought-provoking questions each stakeholder can ask itself, including "What is your system protecting?", "What are the (hidden) competing commitments?", and "How honestly are you engaged with your reward/protect/incentive structures?".

Case Studies: DEI and OA

The workshop then segued into case studies on DEI and OA at various organizations. Sybille Geisenheyner, Director of Open Science Strategy & Licensing at the American Chemical Society (ACS), spoke about the ACS's perspectives on DEIR (R = respect). For their publication portfolio, ACS is strategically committed to several principles, including gathering baseline data on diversity in their journals, training editors to recognize and interrupt bias in peer review, and developing an actionable diversity plan for each of their journals, among others. Geisenheyner then shared how ACS publications have made notable progress in editor diversity over a 10-year period, showing greater diversity in gender and geographical location. She also explained how the program's Author and Reviewer Labs provide the research community accessible tools to improve their papers and reviews, as well as how the country-discount program provides highly discounted or waived APCs for over 80 countries.

Following Geisenheyner, Holly Falk-Krzesinski, Vice President of Research Intelligence at Elsevier, spoke about the importance of data in DEI initiatives; such data will help drive advances in the commitments organizations make around DEI. She explained that gathering data on gender and race and ethnicity are particularly important, although noted the complexity of doing so on a global scale because how countries and regions define race and ethnicity varies.

Springer Nature's commitment to DEI in scholarly communications was also showcased during the next talk of the workshop. Jennifer Griffiths, Head of Academic Affairs, North America, and Sowmya Swaminathan, Head of Collaborations & Chair, Springer Nature Research

& Solutions DEI Program, began their talk by briefly summarizing the burgeoning research showing that scholarly publishing is plagued by persistent disparities. They then shared the 4 pillars that underpin Springer Nature's DEI program: "1) becoming intentionally inclusive in our practices, 2) engaging our communities and stakeholders, 3) communicating our position and ambition, and 4) improving research practice through policy." Other efforts at Springer Nature include making research accessible to researchers in low- and middle-income countries, spotting DEI issues through the content published in their journals, conferences focused on DEI issues in research, and policies that drive meaningful change.

Pernille Hammelsø, Associate Editorial Director of Life Sciences, Michael Willis, Research Advocate, and Shan Mukhtar, Director of Diversity, Equity, and Inclusion, all from Wiley, spoke about the work Wiley has done on transformative agreements (TAs). With their inclusion-centered strategy, they have negotiated more than 60 TAs that, in their view, have several benefits including wider accessibility, which supports equity, making OA more manageable, and leveling the playing field for researchers in countries lacking adequate resources. The presentation concluded with a case study of Wiley's 4-year TA with the South African National Library and Consortium, the objective of which is to "amplify inclusive scholarship … and break down barriers."

Martin Nuñez, PhD, Senior Editor of the *Journal of Applied Ecology* and Associate Editor of *Biological Invasions* (*BINV*) presented his research from 391 web-indexed ecology journals and found that despite the numerous ecology journals based in the global south, there is still a high cost for authors to get published by them. Thus, geographic diversity in the field does not always mean publication opportunities are equitable for researchers without substantial funding, particularly within current business models used by the publishers of these journals.

Following Nuñez, Stephen Gallo, PhD, Chief Scientist at the American Institute of Biological Sciences (AIBS), gave a talk on representation of authorship in the journal *BioScience*, which is published by the ABIS. Like many fields, the life sciences have long grappled with underrepresentation of historically minoritized groups. In 2021, the ABIS set out to take deliberate steps to increase diversity in the following activities: assessment, training, and communication. As part of these efforts, *BioScience* conducted an author survey, which revealed greater diversity in the younger author population, that diversity is dependent on geographic location but age is not, and that racial disparities are significant. Steps for the future include capturing demographic data as part of the submission process, diversifying the journal's editorial board, commissioning a more diverse set of authors, and outreach to ECRs.

Staying with the theme of editorial board diversity, Matthew McCary, PhD, from Rice University, spoke about the efforts of *BINV* to diversify its set of editors, explaining that editors are the "gatekeepers" of scientific publishing, and that the identity of an editor might influence what is published. The journal set out to establish baseline data of its editorial board by conducting a survey on demographic data including gender, race, and culture. The survey was voluntary. Perhaps unsurprisingly, most of the *BINV* editorial board are based in the United States, only 15% identify as a person of color, and 36% identify as female. English is the primary language of the board. The journal intends to use this data to identify potential sources of bias in the research they decide to publish.

The next panelist was Ada Hagan, PhD, President of Alliance SciComm & Consulting, LLC. Hagan spoke of the work she conducted on behalf of the American Society of Microbiology (ASM) a few years ago, where she examined gender representation and bias at their journals. Her research showed that ASM's editorial boards predominantly identified as men who typically oversaw more manuscripts than women, and while first-author publications were approximately equivalent between men and women, men's corresponding-author publications were overrepresented compared with women's. Other results showed that men were more likely to occupy leadership positions as well as outperform women in manuscript success. Nearly every variable Hagan examined showed that women were likely to be underrepresented.

Mia Ricci, Director of Publications Operations at the AGU, shared a timeline of the organization's activities related to DEI, and explained AGU's intention to balance inclusivity, open science, and sustainability. Furthermore, AGU has a 4-pronged approach to DEI—their goals include "ensuring their content is representative of all people and communities, establishing a clear position and commitment to DEI, reviewing and improving end-to-end processes and policies through the lens of DEI, and strengthening editorial boards and reviewer pools through diversity of perspectives." Ricci shared examples of AGU's efforts to achieve each of these goals.

Following Ricci was Robert Harington, PhD, Associate Executive Director of Publishing at the American Mathematical Society (AMS). Harington discussed AMS's reaction to the Nelson Memo,[5] noting that whatever path the organization takes, it does not want to burden authors. The Nelson Memo was released by the United States Office of Science and Technology Policy in August 2022 and provides policy guidance to federal agencies with research and development expenditures on updating their public access policies. Gold OA is a model of scholarly publishing in which articles are made freely available to readers immediately upon publication,

with no subscription fees or other access barriers. Authors or their institutions typically pay a publication fee to cover the costs of peer review, editing, and other production expenses. For math researchers Gold OA is not a sustainable route as there is not a lot of funding for mathematical researchers. Furthermore, TAs also are not the perfect solution as small institutions are not generally included in TAs. Harington emphasized that "one size doesn't fit all" when talking about routes to OA and that public access does not necessarily equate to equal access.

Adriene Lim, PhD, Dean of Libraries at the University of Maryland (UMD), spoke of the moral imperative of open scholarship, equity, and inclusion. She views knowledge as a human right. Lim's talk focused on the various barriers that prevent true open scholarship, including the fact that the current incentive systems in research do not support equitable access; current costs for universities, libraries, and authors are unsustainable and affect the advancement of DEI; and the current assessment system for researchers does not truly capture quality. Lim also explained that open scholarship is a cross-sector opportunity, including government, international organizations, higher education, philanthropy, learned societies, and libraries. Lim concluded her talk by explaining the UMD's response to the call for open scholarship, including examining new publishing models, Green OA, and opportunities for open science, research data, and education.

The last case study of the workshop was presented by Sudip Parikh, PhD, from the American Association for the Advancement of Science. The primary thrust of Parikh's talk was that public access is not equitable access. He emphasized that some OA publishing models are particularly challenging for ECRs. He also explained that APCs can "freeze inequities into place" and are building an entirely new barrier into the system.

Integrating DEI into OA Requirements

Both days of the workshop included breakout discussions with 3 groups, each given 3 questions posed to the attendees:

- Group 1: What do we need to make our case for DEI?
- Group 2: What systems must change and how?
- Group 3: How do we build a cohesive voice?

The conclusions reached from each group were presented to all attendees at the end of the workshop.

Group 1 emphasized the need for a toolkit to articulate what changes need to be made, and the need to be able to measure the results from those changes.

The conclusions of Group 2 included the need to take inventory of systems and rethink good science, for flexibility to allow for creativity opportunities, to embed practices within systems and use data and evidence to inform action and change to the greatest extent possible, to institutionalize accountability, and to build in long term transparency.

Group 3's conclusions centered on the need for a coalition to be formed to work on these questions further and on an ongoing basis to reach solutions that work for and include all stakeholders, as well as a DEI expert and mediator, to help facilitate the difficult and complex conversations needed to reach a new landscape of publishing that fundamentally integrates DEI and the variety of publisher needs around OA requirements.

Summary and Key Takeaways

This 2-day workshop brought together representatives from journals, publishers, researchers, and librarians to share experiences, discuss what is working and not working, and to identify future action steps that can advance DEI best practices in OA publishing. This workshop highlighted that underlying commitments help shape whether DEI goals, objectives, and action steps are realized or not. Presentations shared at this meeting and rich discussions offered insights into lessons learned from the field. Several key takeaway messages were derived from the 2-day workshop. These key takeaway messages highlighted the intersection of DEI and OA in scholarly publishing (see the Figure):

- Establishing systems to collect baseline data to better document the demographic make-up of peer reviewers, editorial board, and authors.
- Training editors, editorial board members, journal staff, and other volunteer groups to recognize and intercept biases in peer review, selecting papers for publication, and/or the application of editorial processes.
- Journals would benefit from creating and adopting actionable diversity building plans.
- Taking action steps to avoid editorial boards' lack of representation of women and racial and ethnic groups.
- Establishing action steps to include participation among small academic and research institutions.
- Journals should remain committed to avoiding gender, racial/ethnic, and geographic disparities in scholarly publishing.
- Maintaining an intentional focus on using policies and procedures to advance diversity, equity, and inclusion in OA publishing.
- Taking steps to make research accessible to low- and middle-income countries.
- Taking steps to provide better opportunities for researchers from and in low- and middle-income

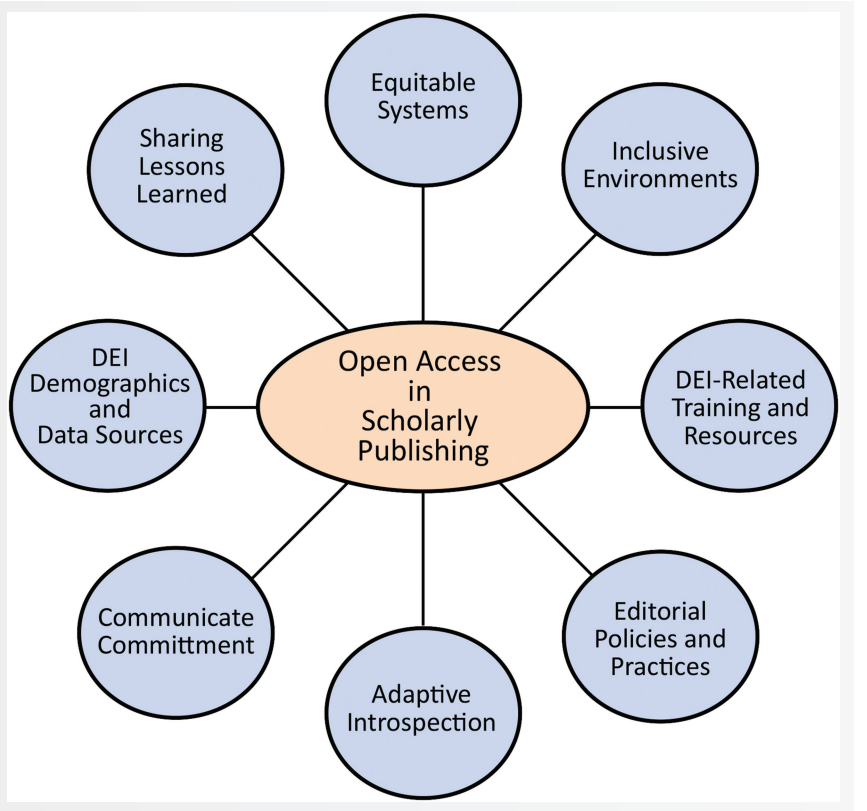


Figure. The Intersection of Diversity, Equity, and Inclusion and Open Access in Scholarly Publishing.

countries to be able to publish their work without a high-cost burden.

- Adopt, implement, and utilize findings from author surveys to identify diversity strengths, weaknesses, and barriers to participation among authors, editorial board members, and journal staff.
- Ensuring open access to scholarly information can be achieved through cross-sector partnerships between government, international organizations, higher education, philanthropic organizations, learned societies, and libraries.

In closing, ESA plans to generate a final report based on the rich exchange of ideas, best practices, and recommendations gathered from invited attendees at this 2-day workshop. This summary will not only include examples of key take-away messages like those presented above, but also summaries of the discussions around the 3 questions: What is needed to make the case for DEI? What systems must change and how? What is needed to build a cohesive voice in support of DEI and OA publishing? ESA plans to make the report available to the scholarly publishing communities once finalized and approved for distribution.

References and Links

1. https://c4disc.org/
2. Jack L Jr. Complete republication: recent updates to CSE recommendations for promoting integrity in scientific journal publications: 7 ways to integrate diversity, equity, and inclusion into scholarly publishing. Prev Chronic Dis. 2023;20:230051. https://doi.org/10.5888/pcd20.230051
3. https://www.councilscienceeditors.org/dei-scholarly-resources
4. Jack L Jr, Iwuchukwu OF, Olson PJ, Johnson AR, Baskin P, Billingsley MK, Deyton J. CSE's Diversity, Equity, and Inclusion (DEI) Committee: celebrating our first year of growth, successes, and future direction. Sci Ed. 2022;45:124–130. https://doi.org/10.36591/SE-D-4504-06
5. https://www.whitehouse.gov/wp-content/uploads/2022/08/08-2022-OSTP-Public-Access-Memo.pdf

The Story of the JU Fanny Pack, Part Deux: Building Community and a Vibe, with a Bonus Pet of the Month Calendar

Jennifer Regala and D Robert Siemens

Last year, The Story of the JU Fanny Pack[1] was first told. It was 2022, and our first ever American Urological Association (AUA) publications booth debuted at our annual meeting, #AUA22, in New Orleans. This meeting was extra special because it was the urological community's first large gathering after the 2020 and 2021 meetings were canceled because of the COVID-19 pandemic.

Our goals for our inaugural booth were centered around featuring our 3 peer-reviewed journals and our newsletter/digital ecosystem as follows:

1. *To educate meeting attendees about our publications*
2. *To build on our marketing efforts that our publications are "The Voice of Urology"*
3. *To make a big splash about our new Gold Open Access journal, JU Open Plus*
4. *To strengthen long-lasting relationships with our community, especially our editors, reviewers, authors, and readers*

Part of our vision was to share swag showcasing our journals as a fun way to connect with our community. One of those items, The Journal of Urology® (JU) Fanny Pack (intentional caps), exploded in a frenzy using a combination of planned and organic social media strategies. This first iteration of the meeting's most sought-after swag was black, with JU's official logo. JU, the flagship journal of the AUA, is more than 100 years old and has a long history of publishing global urological research. We believe that the JU Fanny Pack, which on the surface is undoubtedly a silly piece of swag, built long-lasting relationships in the short span of a 4-day meeting like we had never seen before in the history of our publishing program.

I share authorship of this issue's Social Media column with D Robert Siemens, MD, FRCSC. Dr Siemens is Professor and former Chair of the Department of Urology at Queen's University and is cross-appointed to the Departments of Oncology and Biomedical and Molecular Sciences. He is a member of the Cancer Care and Epidemiology research unit and is Director of the Centre of Applied Urological Research. He served as Editor of the Canadian Urological Association Journal until 2020 and is now the Editor-in-Chief of The Journal of Urology. He has published more than 300 peer-reviewed articles.

We have collaborated to share the excitement and fun of the second year at our publications booth while it was still fresh from #AUA23 (held April 28–May 1, 2023 in Chicago). We love the momentum we are creating to make our journals a community. We look back at our year-over-year growth vs. last year and see how much we have grown the community and engagement around the Voice of Urology. We also recognize that we have so much further to go.

The one comment Dr Siemens had last year was: "I love this fanny pack, but why isn't it pink?" (Side note: obnoxious pink is Jennifer's signature color.) That is all Jennifer needed to hear to move forward with making the 2023 JU Fanny Pack the most perfect power color of all time.

And then Dr Siemens showed up with an idea as big as the fanny pack. We send a monthly newsletter to our JU Editorial Board, "The JU Stream," which is an engagement tool we use to connect the members of our team. We report monthly peer-review statistics, editorial report cards, Editorial Manager tips and tricks, and other newsworthy updates. Additionally, though, we focus on fun stuff: "catching" our editors doing good works, tweets of the month, and the most favorite feature of all: the JU Pet of the Month. The concept is simple: We invite our editors to share their pet photos, and we write some funny blurbs to go along with the pics. This highlight has taken off, and I spend an exceptional amount of time wrangling an inbox of pet photos. Dr Siemens took this popular concept to the next level, though, when he came up with the idea of a JU Pet of the Month calendar (Figure 1

Jennifer Regala is Director of Publications/Executive Editor at the American Urological Association. D Robert Siemens, MD, FRCSC, is Professor of the Department of Urology at Queen's University, cross-appointed to the Departments of Oncology and Biomedical and Molecular Sciences, member of the Cancer Care and Epidemiology research unit, Director of the Centre of Applied Urological Research, and Editor-in-Chief of The Journal of Urology®.

https://doi.org/10.36591/SE-D-4602-10

CONTINUED

[online]). These calendars were received with great delight (and lots of social media hype) from meeting attendees.

Now, on to the story of the triumphant return of the JU Fanny Pack to #AUA23: new color, same goals, big vibes, lots of tweets.

Perspective from Jennifer Regala, the AUA's Director of Publications: Let's Build on Last Year's Vibe

When we headed to New Orleans in May 2022, we were clueless and had no idea what to expect. We knew we had a big job ahead of us. We had goals to meet, and we had to prove that we deserved that big beautiful booth with its premium placement in the center of meeting festivities. The fanny pack played a huge role in what turned out to be a very successful first year. A beautiful booth (designed and executed by Heather Corkin, Jennifer Kennedy, Siena Manoogian, and their teams), complete with a selfie station with life-sized journal covers, served as the backdrop for our efforts. And our editorial leadership showed up big time for this representation. Dr Siemens and his fellow Editors-in-Chief (Dr John Davis, *JU Open Plus*; Dr John Denstedt, *AUANews*; and Dr Stephen Jones, *Urology Practice®*) spent hours at the booth, along with countless other editorial board members from all publications. Attendees came in droves to learn from them and, of course, pick up the fanny pack everyone was wearing.

I spent the rest of 2022 into 2023 tantalizing our social media following with plans for Chicago swag. I ran Twitter polls asking people to vote on fanny pack color and asking for input on alternative names to "fanny pack." And our initial fanny pack recipients tweeted pics of their coveted swag all year, too. Dr Siemens even had a photo shoot of his fanny pack on a beach in Portugal (that is dedication to the cause).

Although we don't have hard data (put that on our neverending to-do list we lovingly call the "firehose list"), we have seen a marked change in our relationships with anyone and everyone who comes into contact with our editorial office. From early-career researchers to seasoned professionals, from advanced-practice providers to biostatisticians, people feel like they can approach us now. We have seen a marked rise in presubmission inquiries, for instance, because people are comfortable approaching us. Our reviewer pool is way up, which has led to an increase in editorial comments and even quality frontmatter editorials and other featured content.

Reviewing last year's articles allowed me to reflect on the published goals I stated for Chicago at that time. The first was to involve our editors in our efforts. Done. The second goal was "don't overcommit." MISERABLE FAILURE. If you know me, I always overcommit, and I remedy that by committing some more. This issue must and will be fixed for next year. The third goal was to do a better job of cross-promoting other AUA programming with the publications. One way we did this was to coordinate swag with our colleagues. A big hit at our meeting was our public policy and advocacy booth, where they handed out the perfect pink sunglasses, and our AUA Census booth, where they handed out urology pun-themed button "flair" to personalize the fanny pack. These connections were a super fun way to get new traffic to our booths. The final goal was to find the next fanny pack, which was all Dr Siemens: the JU pet calendar.

The trick of the fanny pack is that we do not simply leave these coveted items out on the counter for anyone to swipe. We keep them under lock and key, using word of mouth (and the power of social media) to have people seek us out to chat. And we never simply give a fanny pack away. We want to know more about each attendee. Do you publish? How do you read the journals? What do you like? What don't you like? Do you want to take a selfie? Can we follow you on Twitter? Tell us your submission pain points? And thus a friend of the publications is made, and the fanny pack exchange is finalized. Multiply that by hundreds of interactions, and we found we created a loyal following that resulted in submissions, new reviewers, new article pitches, and loyalty we couldn't have gotten in any other way.

I have to point out here that I am one lucky Director of Publications. I work with quality humans who understand how I think. At the AUA, we chase impact, not Journal Impact Factor. We want the work of all of our publications to touch as many readers as possible and to be foundational to future research. And we want all of our community to feel engaged with our content and the people behind it. A lot of editorial leaders and society leadership would not support these tactics, but the wholehearted, genuine acceptance of our swag shenanigans has been critical to our success.

Dr Siemens might have raised an eyebrow ever so slightly to the hot pink whirlwind that I am, but I know he gets it now. He is not only supportive of this mission but amplifying it. There is a *je ne sais quoi* element that makes the engagement around our swag compelling and unifying. Most importantly, he surely did wear that pink fanny pack (cross-body like the cool kids, no less) for almost the entire meeting (Figure 2). And now he's an influencing machine, too, with a hugely epic swag success in imagining the one-of-a-kind pet calendar.

Key practical items to replicate this annual meeting experience for your publications:

1. **Don't take yourself too seriously.** The swag needs to be light-hearted, easy to carry home in a suitcase, and memorable. Don't overthink it—make it FUN.
2. **Keep the swag hidden.** It makes all the difference. You won't believe the amazing conversations you'll have and the new connections you'll make. I can't tell you how many presubmission inquiries, *AUANews* authorship

CONTINUED

Figure 2. The JU Fanny Pack in all its perfect pink glory. From left to right, Jennifer Regala, American Urological Association (AUA) Director of Publications; D. Robert Siemens, Editor-in-Chief, *The Journal of Urology*®; Larisa Bresler, AUA Chief Diversity Officer.

commitments, and new reviewers I've received from these interactions.

3. **Start spreading the word early.** For 2023, I remembered who our most ardent fanny pack lovers were from 2022. Debra Gottsleben was one of our Patient Perspectives abstract presenters in 2022 and is also an AUA Editorial Office favorite. She helped us to spread the word organically by tweeting about scoring a fanny pack in 2023, and she continues to tweet about it even now that she's home! (Figure 3 [online]).
4. **Use your conference hashtag.** Your unique hashtag is the quickest, easiest way to get buy-in on your efforts.
5. **Get organizational and editorial leadership to partner with you on your efforts.** This item seems hard, but I promise you it's the easiest one on the list. Your team will love being a part of the fun and the hype.

Perspective from D Robert Siemens, Editor-in-Chief: Engagement and Community

So how in the world does one best engage authors, readers, and friends of a medical journal at its affiliated association's annual meeting with nearly 15,000 attendees? How does one translate and amplify the excitement felt by the editorial and publications team in a 2.6 million-square foot convention center, filled with fairly overwhelmed and over-stretched attendees bouncing among academic sessions, novel industry offerings, and a plethora of add-on meetings?

A session in the exhibit hall, hosted by eager editors, highlighting the out-of-the box initiatives of the journal, hopefully getting ahead of the curve of the ever-increasingly complex publishing world, would attract several of the dedicated. But at any one time there are more than 2 dozen sessions in progress. A journal "named" state-of-the-art lecture during a plenary session is undoubtedly some good branding and would garner some good will, especially if the topic is innovative and aligns with the vibe that journal is trying to embody. However, that plenary is packed with ground-breaking, practice-changing talks that easily distract. Massive signage in the grand hall of the conference center? Way too much competition with the newest and brightest wares from our industry colleagues.

In comes the pink fanny pack! No advertisement needed. Three or four strategic handouts, with subsequent tweets, to friendly influencers (aka the popular kids), and the buzz is palpable. Fans of the journal (authors, readers, reviewers, editors) flock to the publication's booth. Selfies everywhere comparing the coolest way to brand the must-have accessory. It's not a joke. Everyone knows what this is about. It's low tech, fun, retro, and with just a tiny bit of anti-establishment rebellion to the theater and seriousness of the meeting itself. Add a pet of the month calendar filled with the furry (mostly) companions of the editors and you have broken the meeting! Only question is how to best keep it rolling next year? Cyan?

Join Us in San Antonio, TX, in 2024!

You know we are already planning for next year, and my colleagues in other departments have started plotting with me on some super fun surprises. Join us in this space next year for an update!

We want to hear from you! The JU Fanny Pack mystique lives on even though the meeting is over, and we are loving seeing pics of the pink magic from all over the world on Twitter. And Jennifer's email is filled with global pleas for additional pet calendars for labs, offices, and homes. What color do you think the fanny pack should be next year? What swag works best for your conferences? How do you make your publications shine at your annual meeting? Tweet us (@siemensr and @JenniferARegala) and share your wisdom and most vibe-worthy ideas.

Reference and Link

1. Regala J. The story of the JU fanny pack. Sci Ed. 2022;45:72–74. https://doi.org/10.36591/SE-D-4502-72

Origin Story: Denise Kuo

It's clear that there is no one path to a career or role in scientific editing and publishing. Origin Stories was created to capture the circuitous routes of these careers and the interesting stories of the twists and turns along the way. The editors encourage readers to email your origin story to scienceeditor@councilscienceeditors.org.

Attending college in the 1990s, my focus was financial independence and the possibility of travel funded by my employer. I believed the best route to both was in science, technology, engineering, and mathematics (STEM) and therefore I obtained a Bachelor's degree in computer science. Entering the workforce in 1994 with knowledge and skills in software development worked out well.

While working for consulting firms that specialized in custom software development and traveling weekly to some fun locations (Toronto, ON, Canada) and some less-fun locations (Warsaw, IN, USA), I also relocated to Jackson, Mississippi, USA. Most of the friendships I developed while living in Jackson were with people I met through my spouse, and most of them worked at the University of Mississippi Medical Center (UMMC), including Gerry McAlpin.[1]

In 2003, when my software consulting job ceased to exist,* Gerry had an idea for my next position. In her role as the managing editor of *Hypertension*, an American Heart Association (AHA) journal, Gerry was in the midst of a transition to use BenchPress for online peer review. Gerry made the case to the Editor-in-chief, Dr. John Hall, that someone with strong computer skills was just what the journal needed to develop and maintain the configurable letter templates. It only took a couple of weeks working part-time to set up the templates, and then Gerry was eager for help in clearing the backlog of email in the journal inbox. Answering email was surprisingly satisfying. Problem-solving and strong communication skills acquired in my previous career were immediately useful. This task also required that I poke around the submission system to find the information needed for responses. I do enjoy learning a new app!

After one year with *Hypertension*, it was time to relocate again as my spouse accepted a position in industry. Gerry preferred not to lose someone she had just spent a year training in peer review, so she worked through the logistics for me to continue working on the journal remotely from Massachusetts. Continuing in the same job despite relocating 2200 km away and working from home? I was hooked. And it did not hurt that I avoided the outrageous expense of daycare for a 1-year-old. In 2004, remote work for an AHA journal was rare and was only possible because I transitioned to a contract position (i.e., self-employed) and was paid via UMMC.

The flexibility in hours, variety of tasks, and steady, although modest, income was enough to keep me at *Hypertension* for several years. As the kids reached school age, I started to wonder about other opportunities. Simultaneously, there was a shift in the operational model of AHA journals. The new approach offered me the opportunity to continue with *Hypertension* as a full-time employee of AHA (with benefits) and the growth opportunity to step into the Managing Editor role while a new Editor-in-Chief onboarded. This allowed me to return to the coveted work-sponsored travel. I went to Glasgow, Scotland, to meet the new EiC Prof. Anna Dominiczak. The trip to Glasgow was the first of many fun international trips for *Hypertension* over the next 8 years.

Denise Kuo is Editorial Consultant/Managing Editor, Origin Editorial, LLC.

References and Links

1. https://www.ahajournals.org/doi/10.1161/HYPERTENSIONAHA.119.14365
2. https://www.thestreet.com/dictionary/d/dot-com-bubble-and-burst

https://doi.org/10.36591/SE-D-4602-04

*Those familiar with history may recognize the time frame as roughly aligning with the dot-com bubble and subsequent burst. What Was the Dot-Com Bubble & Why Did It Burst?[2] provides a nice summary for those interested in a history lesson.

Origin Story: Neen LeMaster

It's clear that there is no one path to a career or role in scientific editing and publishing. Origin Stories was created to capture the circuitous routes of these careers and the interesting stories of the twists and turns along the way. The editors encourage readers to email your origin story to scienceeditor@councilscienceeditors.org.

Hiking is where I find clarity. In early 2021, I embarked on a project to hike with a 22 lb. mace in all fifty US states. A mace (or gada) is a spherical weight mounted on a long shaft used in strength training to build grip, back strength, and shoulder endurance. The inspiration for this was the idea that while we cannot necessarily predict the path, we ultimately decide what we carry with us and how to respond to the circumstances presented.

I was 2 years removed from being diagnosed with rheumatoid arthritis and undergoing pacemaker surgery later the same year. Prior to both, I'd taught yoga full-time for 5 years after spending the previous 5 years working for a journal of Shakespeare studies. After recovering from surgery, I serendipitously found a job as a buyer and associate at a gourmet cheese shop. For a food science nerd who loves making cheese and curing meat, it was a perfect return to work and brought an immense sense of fulfillment.

The shift in customer relations brought on by the pandemic put a huge strain on the shop's staff. For most of 2020, we worked every day. On rare days off, I found respite in Shenandoah. The trails were a 2-hour drive away, and as soon as I hit the park boundaries, mobile phone service evaporated. Once air travel was safer, I started putting more time into my project, and destinations became further afield.

In late 2021, I was in western Texas outside of Palo Duro Canyon State Park on an uncharacteristically foggy morning. All at once, endless plains gave way and broke into a massive canyon as the fog burned off. A royal blue sky contrasted sharply against the orange-red cliffs and my jaw dropped. When I reached the summit of the Lighthouse Trail hours later, I thought, "It's time."

I'd pushed aside my desire to be back in publishing in between bouts of rejected applications, but on almost every hike my mind wandered back to trying again. It was hard

to convince hiring managers that what appeared to be an 8-year career gap wasn't one at all. While teaching yoga, I completed a Master's certificate in nutrition, developed curricula for students, ran my business, and wrote 3 books of poetry. As a cheesemonger, I worked with dozens of vendors, managed staff, wrote copy, and participated in a national conference and competition. 600+ applications later, I eventually connected with a managing editor who saw beyond the titles I'd held to the skills they required.

Six months after that hike in Texas, I was hired as the Editorial Coordinator at the American College of Gastroenterology, a role where I thrive and grow continually. When I look over my shoulder, I remember standing in the shop, looking at my shoes caked in burnt orange sand and letting myself hope.

The path always holds surprises, but we choose what to carry, how to keep putting one foot in front of the other, and stay determined.

Neen LeMaster is Editorial Coordinator, American College of Gastroenterology.

https://doi.org/10.36591/SE-D-4602-05

Does Summer Really Exist for Science Editors?

Ilke Coskun Benlidayi

Editors are the stewards of their journals. They are responsible for the content of the journal, as well as the accuracy of an ongoing publishing process. Year round, editors are accountable to the journal owners and stakeholders,[1] including reviewers, authors, and readers.

The editor role requires several skills that are crucial for the job. Intellectual adaptability is one of them. The editors should be prepared to read and decide on various topics across the scope of their journals. In this regard, a broad scientific interest is essential. Decisiveness and efficiency are also important, as an editor has to make critical decisions on submitted/peer-reviewed manuscripts almost every day. Good writing skills are not enough for the editorship. Representing both themselves and their journals, editors should have good communication skills, as well.[2]

Moher et al.[3] developed 14 key core competencies for scientific editors. Three major areas included the qualities

Ilke Coskun Benlidayi, MD (http://orcid.org/0000-0001-6517-5969), Associate Professor, Cukurova University Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Adana-Türkiye.

Opinions expressed are those of the authors and do not necessarily reflect the opinions or policies of the Council of Science Editors or the Editorial Board of Science Editor.

https://doi.org/10.36591/SE-D-4602-01

CONTINUED

and skills of the editor, publication ethics and research integrity, and editorial principles and processes. In terms of skills, a broad knowledge of the journal's scope is essential. Making sound and fast judgments while deciding on manuscripts is of great importance. This would require the skill of synthesizing information. To maintain lifelong learning, it is of value for editors to join a professional society for scientific editors, attend relevant conferences and symposiums regularly, and set learning goals. Clear communication skills from a leadership perspective are also essential. Regarding publication ethics and research integrity, the editor should have the ability to identify several issues such as conflict of interest, plagiarism, redundant submissions, and bias in research. In terms of editorial principles and processes, a scientific editor has to analyze journal policies and metrics, assess the consistency of the submissions, and lead the peer-review process properly.[3] Early career researchers should be encouraged to participate in science editing by being given the opportunity to join the editorial board of a journal.[4]

Editors receive submissions on any given day. Therefore, the job does not only involve working 5 days a week. Since the journals do not stop, the editors may have to work on vacations, as well.[5] Moreover, there could be certain periods in which the science editors experience challenges. For instance, the coronavirus disease 2019 (COVID-19) pandemic has put additional weight on editors. Due to the efforts given to the identification of the pathogenesis and elucidating potential treatment options, there have been numerous submissions related to COVID-19.[5]

Overall, editors play a crucial role in scholarly publishing. They put their time and effort into the development of their journals. On some occasions, the role also requires working on summer holidays. So, does summer really exist for science editors?

References and Links

1. World Health Organization. Regional Office for the Eastern Mediterranean. (2009). Manual for editors of health science journals. WHO, 2009. https://apps.who.int/iris/handle/10665/119900
2. Budde PP. So you think you can edit? Mol Biol Cell. 2014;25:2539–2541. https://doi.org/10.1091/mbc.E14-02-0719
3. Moher D, Galipeau J, Alam S, Barbour V, Bartolomeos K, Baskin P, Bell-Syer S, Cobey KD, Chan L, Clark J, et al. Core competencies for scientific editors of biomedical journals: consensus statement. BMC Med. 2017;15:167. https://doi.org/10.1186/s12916-017-0927-0
4. Vuong QH. The editor: a demanding but underestimated role in scientific publishing. Learned Publ. 2022;35:418–422. https://doi.org/10.1002/leap.1466
5. Coskun Benlidayi I. The impact of the COVID-19 pandemic on science editing. Sci Ed. 2021;8:126–127. https://doi.org/10.6087/kcse.241

APTARA

Serving the world's largest publishers and Fortune 500 companies, Aptara's full-service content production accelerates information providers' transition from print to digital. From creation and design to new media enhancements and output for all digital devices and platforms, Aptara can leverage your business needs by creating innovative digital products that deliver content optimally while giving content providers renewed agility and revenue opportunities.

Committed to delivering world-class solutions

INNOVATION THAT SETS YOU APART FROM THE REST

Our skilled professionals and industry veterans understand your brand requirements to develop customized content. Our proven track record ensures repeat business. Since we are chosen by industry professionals, we ensure:

- Top quality services
- Scalable and technological solutions
- Consistent on-time delivery
- Cost-effective content production
- 24 × 7 client support

Our Areas of Expertise:

- K-20 Education
- Publishing & Conversion Services
- Corporate Learning & Performance
- IT Services
- Data Management Services
- Customer Lifecycle Management

Services Offered

- Digitization and/or conversion of legacy content
- End-to-end services including Production Editing services for STEM, humanities, and trade publications
- Automated page-charge collection process using SciPris
- Automated Abstracts and Conference Proceedings into XML, PDF, Responsive HTML, and EPUB3
- Editorial and publishing production services
- Educational publishing to design preeminent programs in K–20 content space
- Rights and permissions, plagiarism check, and content development
- Animation development and voiceover audio services
- Tagging video content for a consistent display, test-to-speech functionality and searchability
- User-driven accessibility services
- Back-office process support and project management services

+1 (703) 352-0001
www.aptaracorp.com
2901 Telestar Court, Suite 522 Falls Church, VA 22042
moreinfo@aptaracorp.com

Council of Science Editors
P.O. Box 7
Mullica Hill, NJ 08062